FINAL
ENVIRONMENTAL IMPACT STATEMENT

MANEUVER CENTER OF EXCELLENCE
FORT BENNING, GA

June 2009

Prepared for
Garrison, U.S. Army Infantry Center
Fort Benning, GA

Prepared by
U.S. Army Corps of Engineers
Mobile District
P.O. Box 2288
Mobile, AL 36628

VOLUME I: Final EIS

The NEPA Process

NEPA – the National Environment Policy Act of 1969 – is our national charter for protecting the environment. The goals of NEPA are to consider all appropriate environmental factors when making decisions, involve the affected and interested public early in the environmental analysis process, seek less environmental damaging ways to do our jobs, and document in plain language for the decision maker (in this case the Army) and the public the impact analysis we used for the Maneuver Center of Excellence and Transformation at Fort Benning. The vehicle used to meet these goals is the Environmental Impact Statement, or EIS. This is the highest level of analysis prepared under NEPA and is being used for the Fort Benning Transformation action. Compliance with NEPA guidance for our EIS preparation involves several critical steps:

1. *Announce that an EIS will be prepared*. For this EIS, a Notice of Intent was published March 18, 2008 in the *Federal Register*.
2. *Conduct Scoping*. This is the first major step in identifying the relevant issues to be analyzed in depth and eliminate the issues that are not relevant. Within this process, the Army is very active in soliciting comments from the public, local governments, federal and state agencies, federally recognized American Indian Tribes, and environmental groups to ensure their concerns and issues about the proposed Transformation action are included in the analyses. For this EIS, the Army held a scoping meeting on April 22, 2008 in Columbus, GA. In addition, advertisements were run in local newspapers and letters were sent to federal, state, and local regulatory agencies announcing the proposed action as well as identifying the scoping meeting date, time, and location.
3. *Prepare a draft EIS.* The first comprehensive document for public and agency review is the draft EIS. This document examined the environmental impacts of the proposed action and action alternatives that were determined to be relevant from the scoping initiatives, and analyzed all reasonable alternatives, and a no action alternative. This draft EIS was distributed to agencies, the public who had requested copies, and numerous repositories, as well as posted on a public website, to ensure the widest dissemination possible. The Notice of Availability (NOA) was filed with the U.S. Environmental Protection Agency (USEPA) on December 5, 2008 and announced in the *Federal Register* on December 12, 2008 initiating the 45-day public comment period that ended on January 26, 2009. Advertisements were placed in three local newspapers, on three different dates, announcing the NOA and public meeting date and location.
4. *Have a public comment period.* The Army's goal during this process was to ensure that comments about the analysis presented in the draft EIS were received. This was accomplished through receipt of comments through the mail as well as at a public meeting held January 13, 2009. The meeting was conducted in an open forum and provided a direct feedback mechanism for the public and agencies to submit written and/or oral comments directly to the Army. These comments were considered in the preparation of the final EIS and all of the comments are documented and disclosed to the decision maker in this phase of the NEPA process.
5. *Prepare a final EIS.* Following the draft EIS public comment period, a final EIS was prepared. This document is a revision of the draft EIS and includes consideration of all relevant public and agency comments and the Army's responses, and provides the decision maker a comprehensive review of all the alternatives, their environmental impacts, and mitigation measures to minimize these impacts.
6. *Issue a Record of Decision (ROD).* The final step in the NEPA process is the ROD. It identifies which alternative has been selected by the decision maker and what mitigation measures will be carried out by the Army to reduce impacts to the environment.

In addition to the NEPA process, on-going consultation and permitting requirements were undertaken with federal, state, and local regulatory agencies. For instance, under the Endangered Species Act, a written Biological Assessment is required for all major construction activities prior to a federal agency authorizing, funding, or implementing proposed actions that may adversely affect a federally threatened or endangered species or their critical habitat. Formal Consultation involved a 90-day consultation period and an additional 45-day period for the U.S. Fish and Wildlife Service (USFWS) to prepare a Biological Opinion (BO) (135 days total). The USFWS requested an additional 60 days to finalize the BO. A BO is a written statement from the USFWS which summarizes the information on which the opinion is based and details how the proposed action will affect the species or their critical habitat. The U.S. Army Corps of Engineers (USACE) also requires wetlands permits applications be submitted and then approved by the USACE prior to disturbing jurisdictional wetlands; and where applicable, construction permits and plans will be submitted to federal, state, and local agencies and approved prior to any land disturbing activities.

Final Environmental Impact Statement
for the Maneuver Center of Excellence
Fort Benning, Georgia

Prepared by:

U.S. ARMY ENVIRONMENTAL CENTER

and

MOBILE DISTRICT

U.S. ARMY CORPS OF ENGINEERS

_____

BYRON G. JORNS

COL, Corps of Engineers

Commanding

Approved by:

_____

THOMAS D. MACDONALD

COL, IN

Garrison Commander

Final Environmental Impact Statement for the Maneuver Center of Excellence at Fort Benning, Georgia

Lead/Responsible Agency:	U.S. Army Infantry Center
Title of the Proposed Action:	Maneuver Center of Excellence (MCOE) at Fort Benning, Georgia
Designation:	Final Environmental Impact Statement (EIS)
Prepared by:	U.S. Army Corps of Engineers, Mobile District P.O. Box 2288 Mobile, AL 26628
Comments and Enquiries:	Mr. John Brent Fort Benning Directorate of Public Works Environmental Division Bldg #6 (Meloy Hall), Room 310 Fort Benning, GA 31905
Approved by:	Thomas D. Macdonald COL, IN Garrison Commander, Fort Benning

Abstract: The purpose of the Proposed Action is to accommodate newly identified requirements for Armor School training, re-evaluate projects that have moved or substantially changed from those evaluated in the Base Realignment and Closure 2005 and Transformation Actions EIS (or BRAC/Transformation Actions), accommodate the decisions taken by the Army for growth, and support the MCOE standup. Under the Proposed Action, the Army would construct, operate, and maintain additional facilities and training areas (including ranges and maneuver areas) in support of the purpose and need. Construction would occur within the Georgia boundaries of Fort Benning; none would occur within the Alabama portion of the Installation. The proposed community services, personnel support, classroom, barracks, and dining facilities would primarily be constructed in three of the four cantonment areas at Fort Benning. Environmental consequences of two action alternatives—preferred Alternative A and Alternative B—as well as the No Action Alternative were evaluated for numerous resources. According to the President's Council on Environmental Quality National Environmental Policy Act implementing regulations (40 Code of Federal Regulations [CFR] Part 1500-1508), a clear basis for choice among options must be included and analyzed by including a No Action Alternative (40 CFR 1502.14[d]). Because the BRAC/Transformation Actions will be implemented, regardless of the decision taken under this MCOE proposal, they must be included in the No Action Alternative. The No Action Alternative, therefore, includes BRAC/Transformation projects being built during Fiscal Year 2009 (FY09) through FY13, and represent baseline conditions. This EIS offers an opportunity for decision makers and the public to evaluate potential effects, by comparing impacts of all the alternatives with baseline conditions. Under Alternative A, approximately 10,045 acres of total land disturbance would be impacted; about 24,595 acres of land would be disturbed under Alternative B. With both alternatives there could potentially be compatibility issues for lands adjacent to the ranges due to noise. Aesthetic and visual resources would be affected, but insignificantly. In terms of socioeconomics, development would take place and population increases would result in economic gains under both action alternatives, however, there could be negative impacts if the local market cannot support this increase. The number of schools would need to increase so as not to have a negative impact. On-Post traffic congestion and Main Gate build up during peak hours are anticipated, but these impacts would be minimized once road expansions and new access points are completed. There would be short-term construction emissions increases but they would not significantly affect regional air quality in the long term. Noise contours associated with training would grow both on- and off-Post, increasing the potential for annoyance and complaints in adjacent communities. Utilities, safety, and hazardous and toxic materials and waste would not be significantly impacted; however, cultural resources, soils, water resources (including wetlands and state-designated impaired streams), special status species (particularly, the Red-cockaded Woodpecker, relict trillium, and gopher tortoise), and Unique Ecological Areas could experience significant impacts under either action alternative. Mitigation measures would minimize these significant impacts. With either alternative there would be significant impacts for the Red-cockaded Woodpecker; through formal consultation with the U.S. Fish and Wildlife Service, a Reasonable and Prudent Alternative has been developed to avoid jeopardizing the continued existence of this species.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

In November 2005, the Army announced its intent to implement the Base Realignment and Closure (BRAC) 2005 recommendation at Fort Benning, Georgia (GA). Under this recommendation, the Armor Center and School would relocate from Fort Knox, Kentucky to Fort Benning and eventually consolidate with the Infantry Center and School to form the Maneuver Center of Excellence (MCOE). In addition to the MCOE establishment, the Army prepared the BRAC 2005 and Transformation Actions Environmental Impact Statement (referred to as the BRAC/Transformation EIS, action, or projects) to evaluate both BRAC 2005 and Transformation Actions. In November 2007 a Record of Decision (ROD) announced the preferred alternative to implement the BRAC-directed and discretionary decisions, and Transformation Actions (i.e., Army Modular Force [AMF] initiatives, Global Defense Posture Realignments [GDPR], and other Army Stationing activities) for those projects that were funded, programmed, and/or planned through the Fiscal Year (FY) 2013. Those projects that were identified as reasonably foreseeable into FY14, but were not funded nor programmed at time of EIS publication or ROD announcement, were evaluated for their potential cumulative effects. Since the November 2007 ROD, however, projects that were reasonably foreseeable in FY14 have now been funded, programmed, and/or planned, and new projects identified. In addition, some of the projects, originally identified in the FY08 to FY13 timeframe, have changed in location, size, and/or timing and these changes are substantial enough to require a re-evaluation. None of these project changes, however, impacts the ability of Fort Benning to complete the BRAC-directed actions by September 2011. The BRAC-directed actions must be completed by the 2011 BRAC law deadline.

During the same timeframe as the BRAC/Transformation actions were being evaluated, the Army announced its decision to increase its overall size (USAEC 2008) while continuing to restructure its forces in accordance with modular Transformation decisions (USACE 2002a). The permanent increase in the Army end strength, which is being implemented in accordance with Congressional authorizations, will allow the Army to realign its force structure (e.g., modular forces) so that it is capable of meeting national security and defense objectives; implements Quadrennial Defense Review (QDR) recommendations (DoD 2006); sustains unit training and equipment readiness; and eases the deployment burden on its Soldiers and Families.

Through increased numbers and unit reconfigurations, the Army's operational (e.g., combat) readiness is enhanced by giving Soldiers more time to train and maintain their equipment, allowing Soldiers and their Families to spend more time together at home station between deployments, and ensuring the nation has greater capability to respond to increased threats including terrorism. The impacts of this growth were analyzed in the Programmatic EIS (PEIS) for Army Growth and Force Structure Realignment and the Army's ROD was formally announced in the *Federal Register* in January 2008. For Fort Benning, this growth primarily translates into increased student numbers (or throughput) undergoing training at the

Armor and Infantry Schools, Basic Officers Leaders Course, Officer Candidate School, and Army Airborne School.

ES 2 PURPOSE AND NEED

The purpose of the Proposed Action is to:

- accommodate newly identified requirements for Armor School training,
- re-evaluate projects that have moved or changed extensively from those evaluated in the BRAC/Transformation EIS,
- implement the decisions taken by the Army for growth, and
- support the MCOE standup.

The overarching need for the Proposed Action is to provide sufficient operational facilities, training areas (including ranges and maneuver areas), and infrastructure to accommodate the consolidated Armor and Infantry mission of the MCOE and the increase in military personnel and students due to Army Growth. The Army plans to meet this need by minimizing land use incompatibilities and balancing the military readiness mission with a sustained natural environment.

In accordance with 40 Code of Federal Regulation (CFR) Section 1502.4 of the National Environmental Policy Act (NEPA) implementing regulation, and the Army NEPA Regulation (32 CFR 651, also known as Army Regulation [AR] 200-2), the Army has determined that the BRAC/Transformation actions that have been reconfigured and/or newly identified, funded, planned and/or/programmed as well as those projects associated with the proposed MCOE and Army Growth are all activities closely related to each other in location and time on Fort Benning. Their potential environmental effects, therefore, are being evaluated together in this independent EIS which incorporates the pre-existing BRAC/Transformation EIS and ROD by reference.

ES 3 PROPOSED ACTION

Under the Proposed Action, the Army would construct, operate, and maintain additional facilities and training areas (including ranges and maneuver areas) in support of the purpose and need identified above. Construction would occur within the Georgia boundaries of Fort Benning; none would be implemented within the Alabama portion of the Installation. The proposed community services, personnel support, classroom, barracks, and dining facilities would be constructed in three of the four cantonment areas: Main Post, Sand Hill, and Harmony Church (Figure ES-1). Figure ES-2 presents baseline conditions of training lands at Fort Benning. As with the BRAC/Transformation EIS, the range areas are discussed in terms of North and South Ranges, with U.S. Highway 27/280 acting as the dividing line between the two sections.

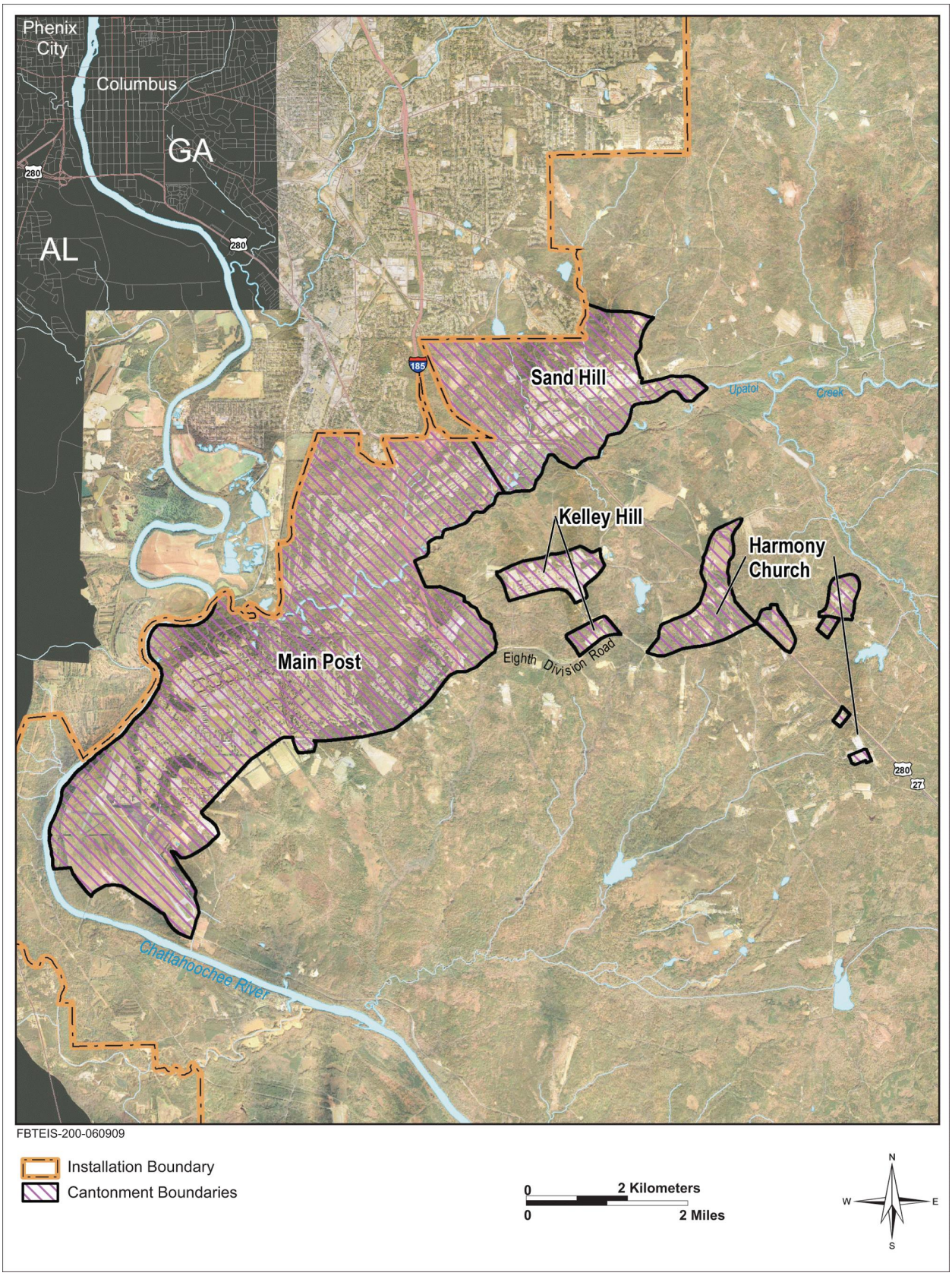


Figure ES-1: Fort Benning Cantonment Areas

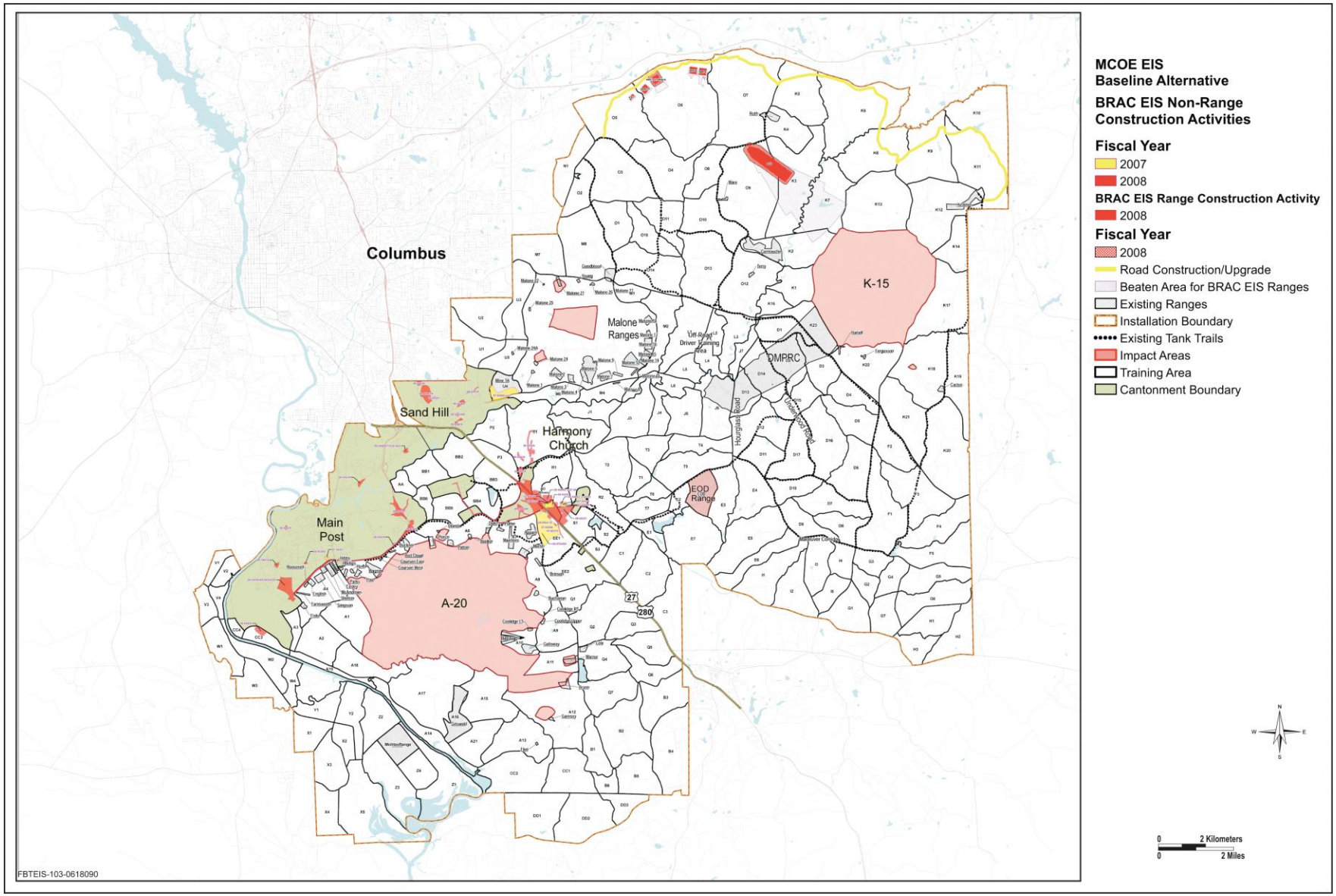


Figure ES-2: MCOE EIS Ranges and Maneuver Training Areas Baseline Conditions

ES 3.1 Changes to BRAC 2005 and Transformation Actions EIS

Given the multi-year timeframe and magnitude of transition at Fort Benning, the planning process has been inherently iterative for BRAC/Transformation actions. As noted in the BRAC/Transformation EIS and Biological Assessment (BA), complete design information was not available for projects slated in FY09 and beyond (USACE 2007a, 2007c). Under Army procedures these projects are planned and programmed up to 3 years in advance, but nothing can be constructed until funding approval is received from Congress. Not until funding is approved can the Army request a final design/build cost proposal from engineering contractors, and once the contract has been awarded it is only then that the 100-percent design is finalized. For BRAC/Transformation projects, it is during this process that projects were changed and redesigned to such an extent that they required another NEPA analysis for their potential environmental impacts.

The following is a general description of the type of projects that are evaluated in this EIS; Chapter 3 identifies the alternatives and has a detailed listing of each project, the Army-assigned project tracking number, and the year in which construction is planned to begin.

Approximately 20 projects originally identified in the BRAC/Transformation EIS have subsequently changed in location or grown in size. Most of the projects have changed in location in the training areas (as opposed to cantonment area projects) and include ranges and Installation-wide training area road development. Twenty seven FY09 projects were included in the BRAC/Transformation EIS. They are, therefore, found in the No Action Alternative of this EIS and will proceed to completion having their NEPA obligations fulfilled under the EIS and associated ROD (USACE 2007a, 2007b).

Several projects have changed in size such as the Vehicle Recovery Course (located north of U.S. Highway 27/280), also referred to as the Ground Mobility Division (GMD), which has decreased in size in Alternative A, as has the hospital replacement located in Main Post for both action alternatives, while the Physical Fitness Center in Harmony Church has increased in size. Installation-wide, several infrastructure projects are also proposed and a number of projects identified in the BRAC/Transformation EIS as reasonably foreseeable in the FY14 timeframe (and were, therefore, analyzed for cumulative effects but not as a part of the original Proposed Action), have since been planned for construction earlier than FY14. Because they are now programmed, the probability of their being funded has increased and the Army felt that they needed to be re-evaluated for their potential impacts under the Proposed Action. These projects are predominantly in the training areas and include numerous ranges. Several new facilities would also be established in the Main Post, Harmony Church, and Sand Hill cantonment areas.

ES 3.2 Army Growth

The objective of the Army Growth Campaign Plan is to permanently increase overall end strength by about 65,000 active component Soldiers by 2013. Of this, a gain of 30,000 Soldiers was previously authorized as a temporary increase. These Soldiers were accommodated in Army units across the U.S. Impacts associated with this increase were evaluated following Army NEPA Regulations and the appropriate level of NEPA documentation completed for the receiving units. At Fort Benning, this

temporary increase included 45 permanent-party military personnel, and 73 military personnel in the 14th Combat Support Hospital, 19th Optometry Detachment, and 497th Movement Control Team for a total temporary gain of 118 personnel. According to an Army Growth Stationing Announcement made by Fort Benning on January 8, 2008, the additional 35,000-Soldier increase is planned to occur across the Army at a rate of 7,000 Soldiers per year between 2008 and 2013. Although the specific student training load and supporting cadre gains were not included in this 2008 Announcement, the following assumptions were used to predict personnel increases:

- The proposed Grow the Army projects would support one additional Initial Entry Training battalion at Fort Benning. This would equate to 120 cadre members and an average daily student load of up to 1,200 (five Companies with 240 Soldiers per Company).
- There would be additional increases in training loads for advanced Infantry and Armor training, as well as Officer Candidate and Airborne School since Fort Benning is the only location for these training opportunities; increases would also occur in the enrollment for Basic Officers Leaders Course which is offered only at Fort Benning and Fort Sill.

To accommodate this growth, numerous housing, dining, and classroom facilities are being proposed within the cantonment areas; only one range would be constructed to meet Growth needs.

As of November 2007, there were 17,771 military personnel, 8,690 civilian employees, and 9,386 students (daily average of the number of students being trained on any one day, based on a total annual attendance) stationed at Fort Benning (USACE 2007a). Following the complete stand up of the BRAC and Transformation activities, an additional 5,605 military personnel, 2,545 civilians and/or contractors, and a daily average number of 7,238 students will be added to Fort Benning (USACE 2007a, 2007b). This increases the total Fort Benning population (not including family members and other dependents) to a total of 35,837 military, civilian, and contractor personnel, as well as 16,624 students (daily average) (USACE 2007a, 2007b). In addition, a temporary increase in Army end strength, authorized in advance of the Army Growth ROD (USAEC 2008), has resulted in an estimated maximum increase of 2,640 in the average daily number of students at Fort Benning (personal communication, Brown 2008). Please note that these numbers represent a snap-shot in time and may change as Army missions evolve.

ES 3.3 Other Projects

There are several proposed projects that, due to implementing the BRAC/Transformation actions, are now needed. These projects were not foreseen and therefore, not included in the BRAC/Transformation EIS and include Warrior in Transition, maintenance, and shopping facilities; medical additions; water treatment plant upgrades, and expansion; as well as, training infrastructure projects for ranges and roads.

ES 3.4 Proposed Cantonment, Range, and Training Area Requirements

Cantonment Area Development. The majority of cantonment area construction would be infill development in Main Post and new development in previously disturbed areas of Sand Hill. The Water Treatment Plant Upgrade and Expansion in the Main Post, approximately 47 acres, would include construction of a new inlet to draw water from the Chattahoochee River. The proposed projects in Sand Hill would together impact approximately 412 acres. The proposed Hospital replacement project, at approximately 137 acres, is the single largest impact footprint in the cantonment areas.

Range and Training Area Requirements. The proposed range and training area development is primarily driven by the ongoing implementation of the BRAC/Transformation actions, however, they are also related to Grow the Army, GDPR, and existing missions. The types of ranges and training area development proposed at Fort Benning include the following (USACE 2008):

- *Vehicle Recovery Course (or GMD) (PN72017)* – used to train Soldiers on how to retrieve tracked vehicles when mired and/or overturned. This includes operating towing equipment and learning towing techniques in various conditions including sandy and muddy areas. The additional equipment associated with this training was fully evaluated in the BRAC/Transformation EIS.
- *Rifle/Machine Gun Zero Ranges (PNs 65035, 65036 and 65039)* – used to train individual Soldiers on the skills necessary to align the sights and practice basic marksmanship techniques against stationary targets. The range is designed for training Shot-Grouping and Zeroing exercises with the M16 and M4 series rifles as well as crew served machine guns.
- *Modified Record Fire Ranges (PNs 65043 and 65049)* – used to train and test individual Soldiers on the skills necessary to identify, engage, and defeat stationary infantry targets for day/night qualification requirements with the M16 and M4 rifles. The training intent of the Modified Record Fire Range is to meet the Army's requirement that every Soldier assigned a M16 or M4 rifle conduct semiannual qualification with their rifle.
- *Multi-Purpose Training Range (PN64551)* – used to train and test crews and dismounted infantry squads on the skills necessary to detect, identify, engage, and defeat stationary infantry and stationary and moving armor targets in a tactical array. In addition to live-fire, this complex can also be used for training with sub-caliber and/or laser training devices. The complex is specifically designed to satisfy the training and qualification requirements for crews and sections of armor, infantry, and aviation units. This complex also supports dismounted infantry squad tactical live-fire operations both with and without supporting vehicles.
- *Fire and Movement Ranges (PNs 65033 and 65034)* – used to train individual Soldier and buddy/teams on basic fire and movement techniques against stationary infantry targets. Soldiers show their ability to select covered and concealed positions, move while under fire, apply principles of teamwork, and use suppressive fire on enemy Soldier targets.

- *Anti-Armor Tracking and Live Fire Complex (PN65078)* – used to train and test Soldiers on the skills necessary to employ anti-armor missile systems, and identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. The complex is designed to satisfy the training and qualification requirements of medium and heavy anti-armor weapon systems. This type of range is also used for field tracking and qualification exercises.
- *Multi-Purpose Machine Gun Ranges (PNs 65070 and 68733)* – used to train and test Soldiers on the skills necessary to zero, detect, identify, engage and defeat stationary infantry targets, moving infantry targets, and stationary armor targets in a tactical array with the following weapons: M2 machine gun, Mk-19 40mm grenade, M60, M240B, M249 squad automatic weapon, M249 automatic rifle, and M24 7.62mm sniper rifle.
- *Range Roads* – under the Proposed Action, new training roads would be constructed and existing training area roads and/or tank trails repaired or upgraded. As a result of consultation with the USFWS, the disturbed area for most new tank trails and range roads has been reduced to approximately 30 feet including berms for Alternative A. Following construction, the average operational width of the road would remain at 30 ft, including the berms to support the variety of wheeled and tracked vehicles used for training. Under Alternative B, the disturbed area during construction of new tank trails is estimated at 96 feet (ft) from centerline, or 192-ft wide, to include berms and erosion control measures for Alternative B. As with Alternative A, following construction, the average operational width of training roads and tank trails would be 30 ft.
- *Water Crossings* – crossings would be established along range roads and trails where stream crossing is required. Currently, Fort Benning uses two designs for water crossings: one is a low-water crossing where the vehicle drives down a hardened slope, goes into the stream, and then proceeds out the other side; the second type is a hardened 30-foot wide roadway over an arched culvert that allows unimpeded stream flow (personal communication, Sweeney 2008).

ES 4 ALTERNATIVES

Alternatives form the core of the NEPA process. In compliance with Army NEPA and CEQ regulations, the Army must consider reasonable alternatives to the Proposed Action. Only those alternatives determined as reasonable relative to their ability to fulfill the purpose and need for the Proposed Action warrant detailed analysis. In addition, alternatives must be technically and fiscally feasible. Through a rigorous evaluation, the Army examined a range of alternatives, determined those deemed reasonable, and identified those not carried forward for detailed analysis.

Described below are the various alternatives under consideration to implement the purpose and need for this action. The No Action Alternative incorporates all projects that were analyzed in the BRAC/Transformation EIS. Inclusion of these projects is necessary because the Army announced their decision to construct these BRAC/Transformation facilities in the 2007 ROD and will be built regardless of this Proposed Action. If any of these No Action Alternative projects are relocated or substantially change in size from what is presented here, the appropriate level of NEPA documentation and agency consultation will be completed by Fort Benning before any construction is undertaken. In this EIS, impacts for all alternatives (including No Action) are also compared against the baseline conditions; this approach provides a clear basis from which to choose. Baseline conditions are those that were found in March 2008 when the Notice of Intent was announced in the *Federal Register* (see Appendix A). As such, it includes the FY07 and FY08 projects identified in the BRAC/Transformation final EIS. If a comparison is done of FY07 projects proposed for construction in the BRAC/Transformation EIS, readers will notice that some were delayed and construction was not started until FY08.

ES 4.1 No Action Alternative

The BRAC/Transformation actions will be implemented regardless of the decision taken under this Proposed Action so they are included in the No Action Alternative. The No Action Alternative, therefore, includes FY09 through FY13 BRAC/Transformation projects. This EIS does offer an opportunity for decisionmakers and the public to evaluate impacts, by comparing impacts due to all alternatives with baseline. Table ES-1 provides a summary of the projects considered as part of the No Action Alternative and Figures ES-3 and ES-4 illustrate the alternative for the cantonment and training areas, respectively. Items noted with an asterisk are projects that have been changed since the BRAC/Transformation ROD.

This page left intentionally blank.

.

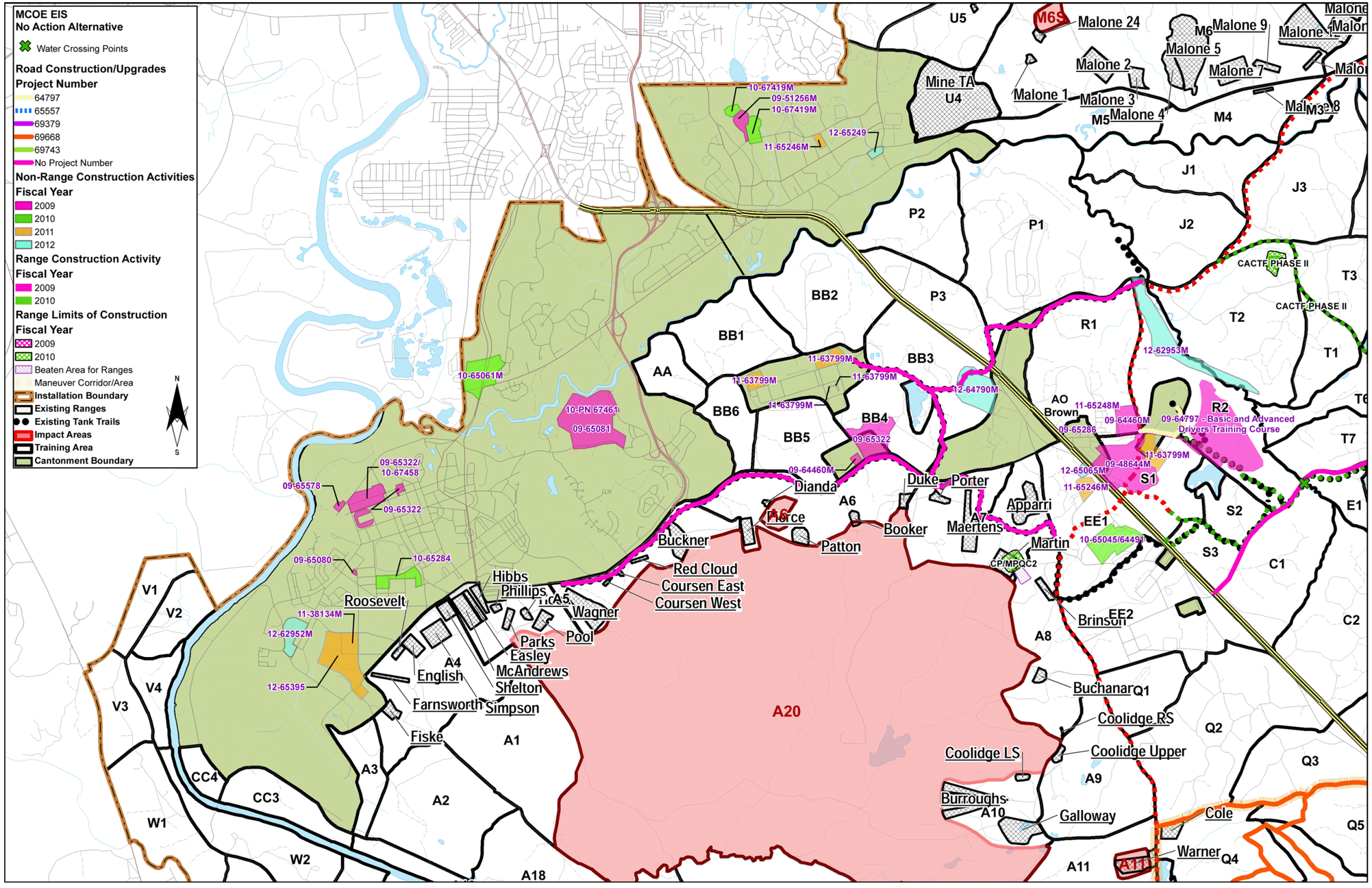


Figure ES-3: MCOE EIS No Action Alternative Cantonment Areas

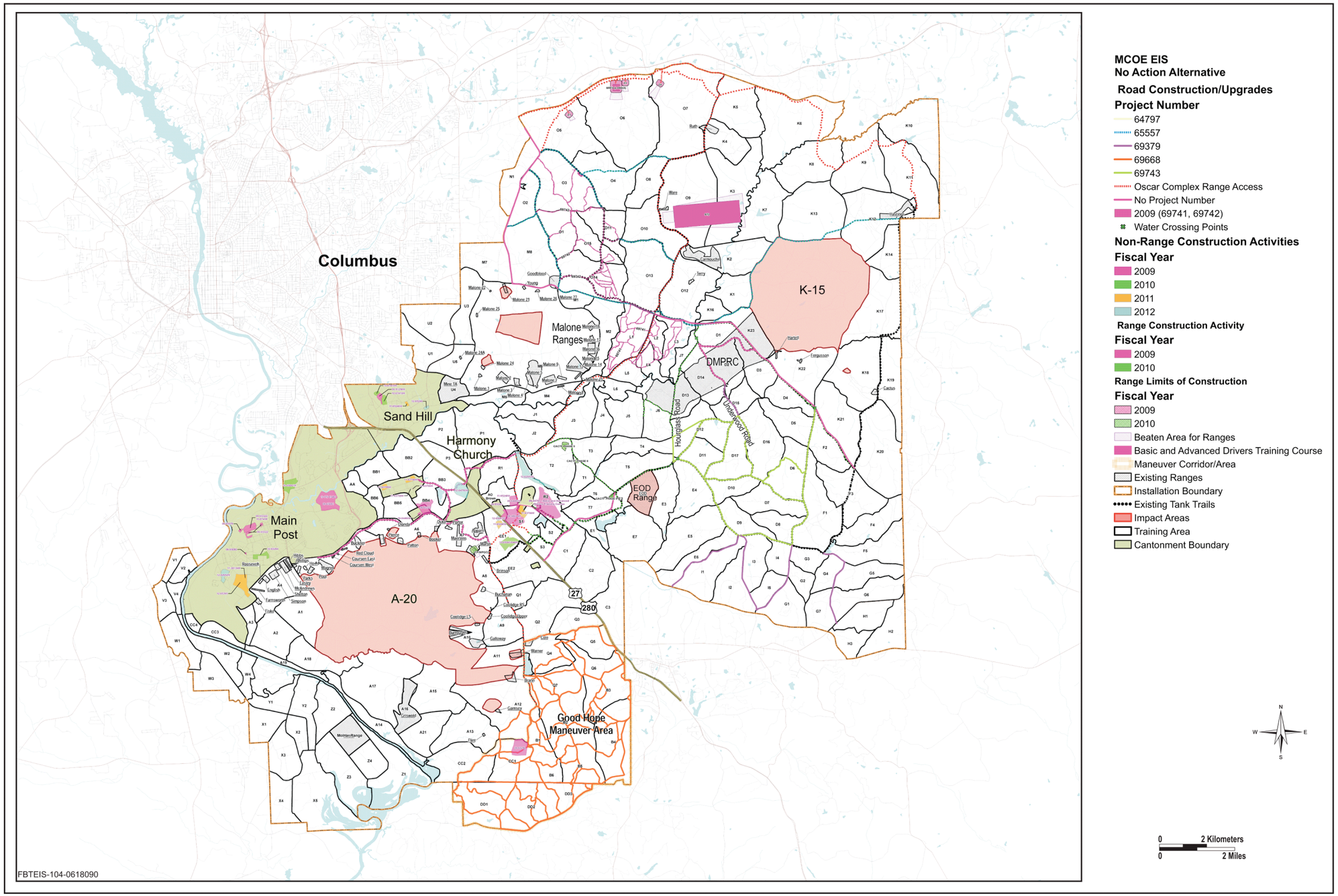


Figure ES-4: MCOE EIS No Action Alternative Ranges and Maneuver Training Areas

Table ES-1: MCOE EIS No Action Alternative Projects

FY	PN	Project Title
09	48644	Central Wash Facility
09	51256	Reception Barracks (Phase 2)
09	64460	DS/GS Vehicle Maintenance Facility
09	64797	Tracked Vehicle Drivers Course
09	72017	Vehicle Recovery Training Area *
09	65035	Rifle/Machinegun Zero Range 1 (Z1)*
09	65036	Rifle/Machinegun Zero Range 2 (Z2)*
09	65037	Rifle Machinegun Zero Range 3 (Z3)
09	65038	Rifle Machinegun Zero Range 4 (Z4)
09	65039	Rifle/Machinegun Zero Range 5 (Z5)*
09	65047	Modified Record Fire 5 (MRF5)
09	65080	Consolidated Troop Medical Clinic
09	65081	Medical Treatment Facility (Increment 1)*
09	65286	Armor Officer Basic Course Headquarters
09	65322	General Instruction Bldg Complex (Phase 1)
09		Convert Non Unaccompanied Personnel Housing/Billeting Space to Transient
09		Infantry Basic Officers Course Headquarters Complex Building
09		Student Dining Facility Main Post
09	65383	Stationary Tank Range 2 (ST2)*
09	65438	Vehicle Maintenance Instruction Facility
09	65578	Criminal Investigation Command Group/Brigade Headquarters Building
09	67419	Reception Station, Phase 3
09	67457	Infrastructure Support, Increment 2*
09	69358	Range Access Road—Good Hope Maneuver Training Area *
09	69668	Good Hope Training Area Infrastructure*
09	69742	Northern Training Area Infrastructure*
09	69743	Southern Training Area Infrastructure*
09	65554	Construct Training Area Roads Paved*
09	69741	Training Area Infrastructure – 19D/K OSUT*
09	65034	Fire and Movement Range 3 (FM 3)*
10	62207	Combined Arms Collective Training Facility (Phase II)
10	64491	Army Reserve Center/Operations and Maintenance Services/Unheated Storage
10	65061	Armor Climate Control Storage Facility
10	65079	Automated Combat Pistol/Military Police Qualification Course*
10	65284	MCOE Headquarters Expansion/Capabilities Development and Integration (CDI)
10	65405	Equipment Concentration Site
10	65557	Repair Existing Training Area Roads*
10	67458	Gen Instruction Bldg Complex (Increment 2)
10	67461	Hospital Replacement (Increment 2)*
11	38134	Barracks Complex Main Post
11	63799	3rd Infantry Division Brigade Combat Team (Heavy) Complex
11	65395	SOF Ranger Support Company
11	67012	Qualification Training Range
12	65246	Community Activity Center*
12	65248	Physical Fitness Center*
12	62953	Rail Loading Facility Expansion*

Table ES-1: MCOE EIS No Action Alternative Projects

FY	PN	Project Title
12	64790	Battle Command Training
13	62952	Brigade Complex Headquarters, 14th Combat Support Hospital
13	65065	Chapel Harmony Church
13	65249	Chapel Sand Hill*

Note: Items noted with an asterisk are projects that have been changed since the BRAC/Transformation ROD.

ES 4.2 Alternatives

Fort Benning used a thorough application of environmental and operational constraints to choose potential alternatives sites for the Proposed Action. The Army's overriding priority for site identification was to ensure the safety of military and civilian populations. The proposed sites were also selected as part of the Installation's goal to minimize interference with its military mission, and its need to address compatibility issues with adjacent land uses, missions, and functions. In siting the proposed training assets, the Army wanted to ensure that performing these activities would be compatible with existing and planned mission requirements as well as sustain the natural environment. For example, live-fire ranges should be co-located with existing impact areas and sites so as to neither constrain nor conflict with existing or planned ranges, or with their associated surface danger zones. After this screening application, Fort Benning identified two action alternatives—Alternatives A and B.

ES 4.2.1 Alternative A (preferred alternative)

The Army has identified Alternative A as their preferred alternative because it best meets the purpose and need of the Proposed Action. Please note that since the draft was announced in the *Federal Register* on December 12, 2008, changes have occurred to Alternative A, primarily in response to the formal consultation process with the USFWS. These changes have resulted in modifications to Alternatives A and B. Revisions to Alternative A include: 1) reduction of the construction footprint in many of the tank trails, roads, and ranges, 2) relocation of the Multi-Purpose Training Range to coincide with the existing Hastings Range, 3) elimination of the Multi-Purpose Machine Gun 1 and 2 Ranges, and 4) reduction of the construction footprint of the Vehicle Recovery Course. In addition to these changes, and pursuant to the Biological Opinion, the Army will mitigate aspects of Alternative A by relocating training associated with the Scout Leaders Course (Army Reconnaissance Course) and the MCOE- related heavy mechanized training course by moving them from the Southern Maneuver Training Area to an off-Post site yet to be determined. This relocation will take place 5 years from the start of Scout Leaders training. To fulfill this mitigation measure; there could be a potential need to acquire land; however, this measure has just been determined through consultation. It is, therefore, too early in the process to have specific sites identified. The appropriate level of NEPA documentation will be undertaken once the Army initiates the siting process. Figure ES-5 illustrates the cantonment area proposed construction under Alternative A and Figure ES-6 shows the training area and range proposed construction areas.

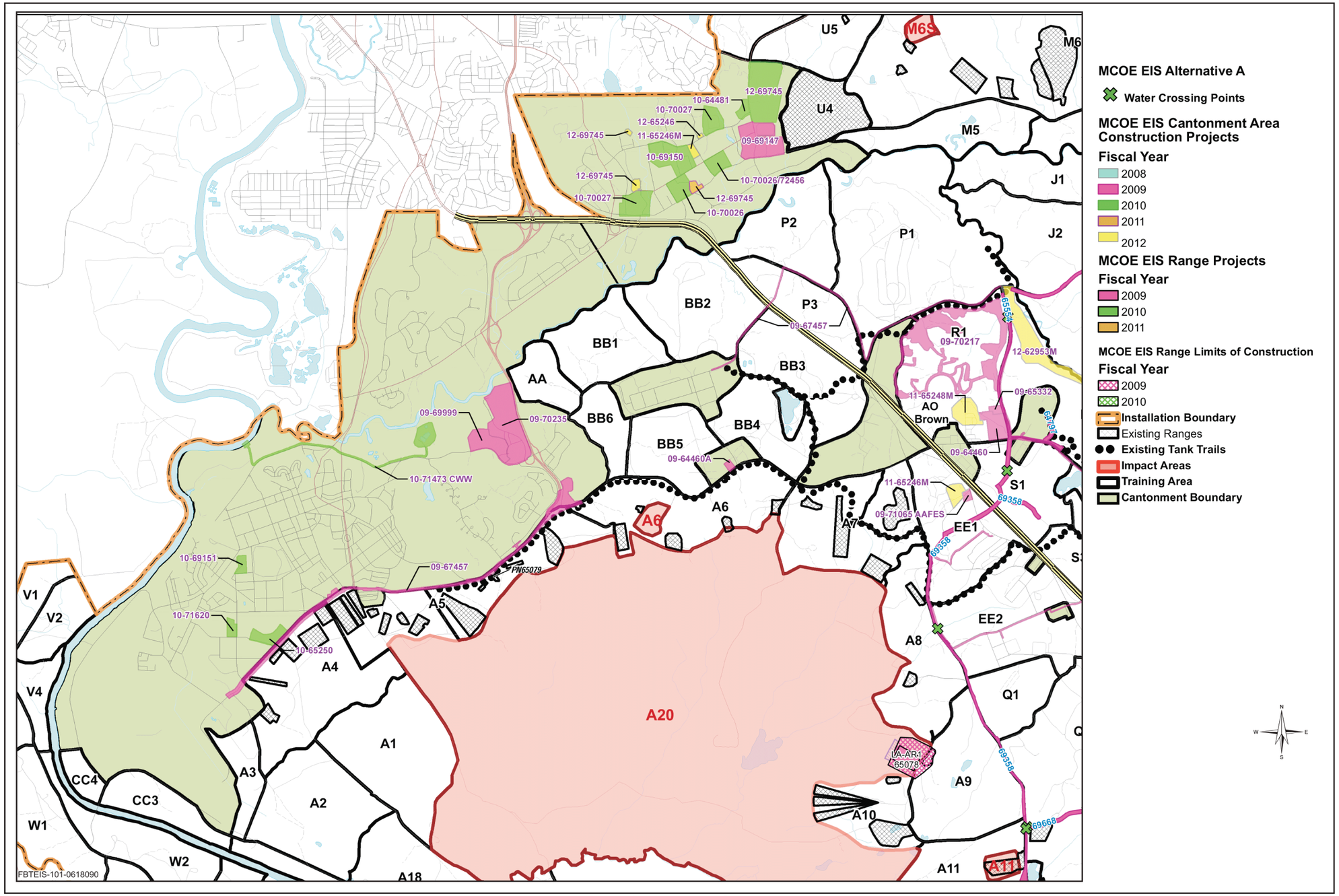


Figure ES-5: MCOE EIS Alternative A Proposed Cantonment Area Construction

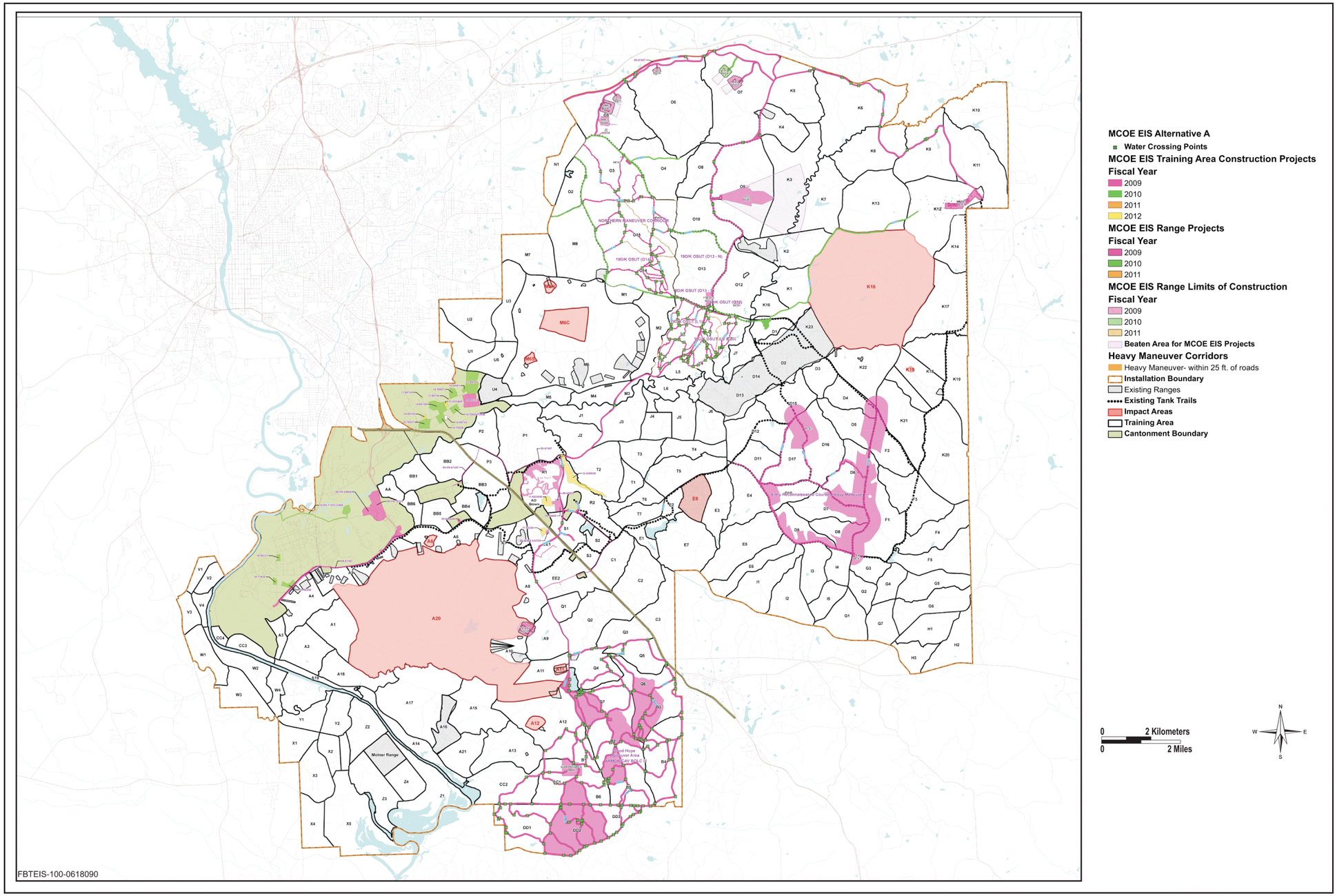


Figure ES-6: MCOE EIS Alternative A Proposed Ranges and Maneuver Training Area Construction

Alternative A Cantonment and Training Area Development

Cantonment and training area development for Alternative A is presented in Table ES-2. The projects are grouped by project location; Army-designated project numbers (PN), construction start dates, the project names, and disturbance-area footprints. Those projects in Alternative A that differ with Alternative B are listed in Table ES-3.

Table ES-2: MCOE EIS Alternative A (preferred alternative) Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	Disturbance-Area Footprint (Acres)
Installation Wide			
65554	09	Construct Training Area Roads Paved	715
67457	09	Infrastructure Support, Increment 2 (Includes Security Fence and Dixie Road Expansion from Michaels Street to Sightseeing Road)	246
65557	10	Repair Existing Training Area Roads, Phase 1	352
Cantonment Area—Harmony Church			
71065	09	Troop Store – Army and Air Force Exchange Service (AAFES) (Non-Appropriated Funds [NAF])	6
64460	09	Direct Support/General Support Vehicle Maintenance Facility	36
65322	09	Shop 1 Maintenance Facility	10
65246	12	Recreation Centers in Harmony Church and Sand Hill	28
65248	12	Physical Fitness Center, Harmony Church	39
62953	12	Rail Loading Facility Expansion	134
Cantonment Area—Main Post			
70235	09	Hospital Replacement	137
69999	09	Warrior in Transition Complex	46
71473	10	Water Treatment Plant Upgrade and Expansion	47
69151	10	Dining Facility to Support Advanced Skills Training (AST)	10
65250	10	Maneuver Battle Lab	27
71620	10	Dental Clinic Addition (Bernheim Site)	10
Cantonment Area—Sand Hill			
69147	09	Trainee Complex Upgrade	81
64481	10	Blood Donor Center	12
70027	10	Classrooms with Battalion Dining Facilities	72
70026	10	Classrooms with Battalion Dining Facilities	50
72322	10	Training Barracks Complex, Phase 1	131
69150	10	Classrooms & Dual Battalion Dining Facilities	66
72324	11	Training Barracks Complex, Phase 2	Note 1
72456	11	Training Dining and Classroom Facilities, Phase 2	Note 2
72457	11	Training Dining and Classroom Facilities, Phase 2	Note 3
69745	12	Training Barracks Complex, Phase 3	Note 1
65249	13	Chapel	(already disturbed area)

Table ES-2: MCOE EIS Alternative A (preferred alternative) Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	Disturbance-Area Footprint (Acres)
Ranges North of U.S. Highway 27/280			
72017	09	Vehicle Recovery Course (GMD)	192
65035	09	Basic 10M – 25M Firing Range 1 (Z 1)	23
65039	09	Basic 10M – 25M Firing Range 5 (Z 5)	22
65036	09	Basic 10M – 25M Firing Range 2 (Z 2)	9
65049	09	Modified Record Fire 7 (MRF 7) – 5.56mm: M855 Ball	38
65043	09	Modified Record Fire 1 (MRF 1) – 5.56mm: M855 Ball	59
64551	09	Multi-Purpose Training Range 1 (MPTR 1) – 25mm, 120mm, 7.62mm, 5.56mm & .50 Caliber (Cal)	0, Note 4
65033	09	Fire and Movement 2 – 5.56mm: M855 Ball	89
69741	09	19D/K One Station Unit Training (OSUT) (Heavy Mounted/Dismounted Training in TA-L1, O12-14 and portions of O15 (Heavy Mounted Training in O14, O15, and L1-5)	271
69742	09	Northern Training Area Infrastructure (Heavy Mounted Training in TA-O1,O3,O11,O14, and O15)	260
69743	09	Southern Training Area Infrastructure	2,936
65034	09	Fire and Movement 3 (FM 3) – 5.56mm: M855 Ball	44
65383	09	Stationary Tank Range 2 (ST 2)	279
64797	09	Drivers Training Course (Access Roads)	18
Ranges South of U.S. Highway 27/280			
65078	09	Anti-Armor Tracking and Live Fire Complex 1	57
69358	09	Range Access Road – Good Hope Maneuver Training Area	162
69668	09	Good Hope Training Area Infrastructure	4,112

Note 1: Both PN72324 and PN69745 occur at the same location as PN72322
Note 2: PN72456 occurs at the same location as PN70026
Note 3:PN72457 occurs at the same location as PN70027
Note 4: The MPTR is being constructed as an upgrade to the Hastings Range so no additional acreage impacts will occur.

Since the draft was announced in the *Federal Register* on December 12, 2008, changes have occurred to preferred Alternative A, primarily in response to the formal consultation process with the U.S. Fish and Wildlife Service. These changes have resulted in modifications to both Alternatives A and B (and are reflected and evaluated in the final EIS). Chief among these changes, and pursuant to the Biological Opinion, is that the Army would mitigate aspects of Alternative A by relocating training associated with the Scout Leaders (Army Reconnaissance Course) and MCOE heavy mechanized training courses by moving them from the Southern Maneuver Training Area to an off-Post site yet to be determined. This relocation would take place 5 years from the start of Scout Leaders training. To fulfill this mitigation measure, there could be a potential need to acquire land; however, this measure has just been determined through consultation. It is, therefore, too early in the process to have specific sites identified. The Army recognizes that if training were to take place at another location, the appropriate level of NEPA

documentation would need to be undertaken to evaluate the potential impacts of this training to land uses; socioeconomics; transportation and traffic; biological, soils, and cultural resources to name just a few.

ES 4.2.2 Alternative B Proposed Cantonment and Training Area Development

Since the draft EIS, no changes to Alternative B were made; while this alternative would meet the purpose and need it is not the preferred option. If this alternative were implemented there would be substantially greater impacts primarily to biological resources, water resources, and soils from tank trails, roads, maneuver areas, and training ranges. Alternative B differs from Alternative A in ways which substantially increase impacts to the amount of land disturbance and associated impacts to a wide range of environmental resources. The total amount of land disturbance associated with Alternative B is 24, 596 acres while Alternative A is 10,045 acres. In addition, Alternative B differs from Alternative A for the following projects:

1. 19D/K OSUT would take place in TA-Q1, Q2, Q3, and Q5 (training areas south of U.S. Highway 27/280 and illustrated in Figure ES-8); moving from TA-L1, L2, and L3 as found under Alternative A.
2. TA-L1, L2, and L3 would be used for existing maneuver training.
3. The Multi-Purpose Machine Gun Ranges 1 and 2 are included in Alternative B only.
4. The Unit Maintenance Facilities is included in Alternative B only.
5. The Automated Combat Pistol Qualification course is also only included in Alternative B.
6. The MPTR (PN64551) would be sited north of Hastings Range rather than within existing Hastings Range footprint.

Figures ES-7 and ES-8 present cantonment- and training-area development for Alternative B, respectively.

This page left intentionally blank.

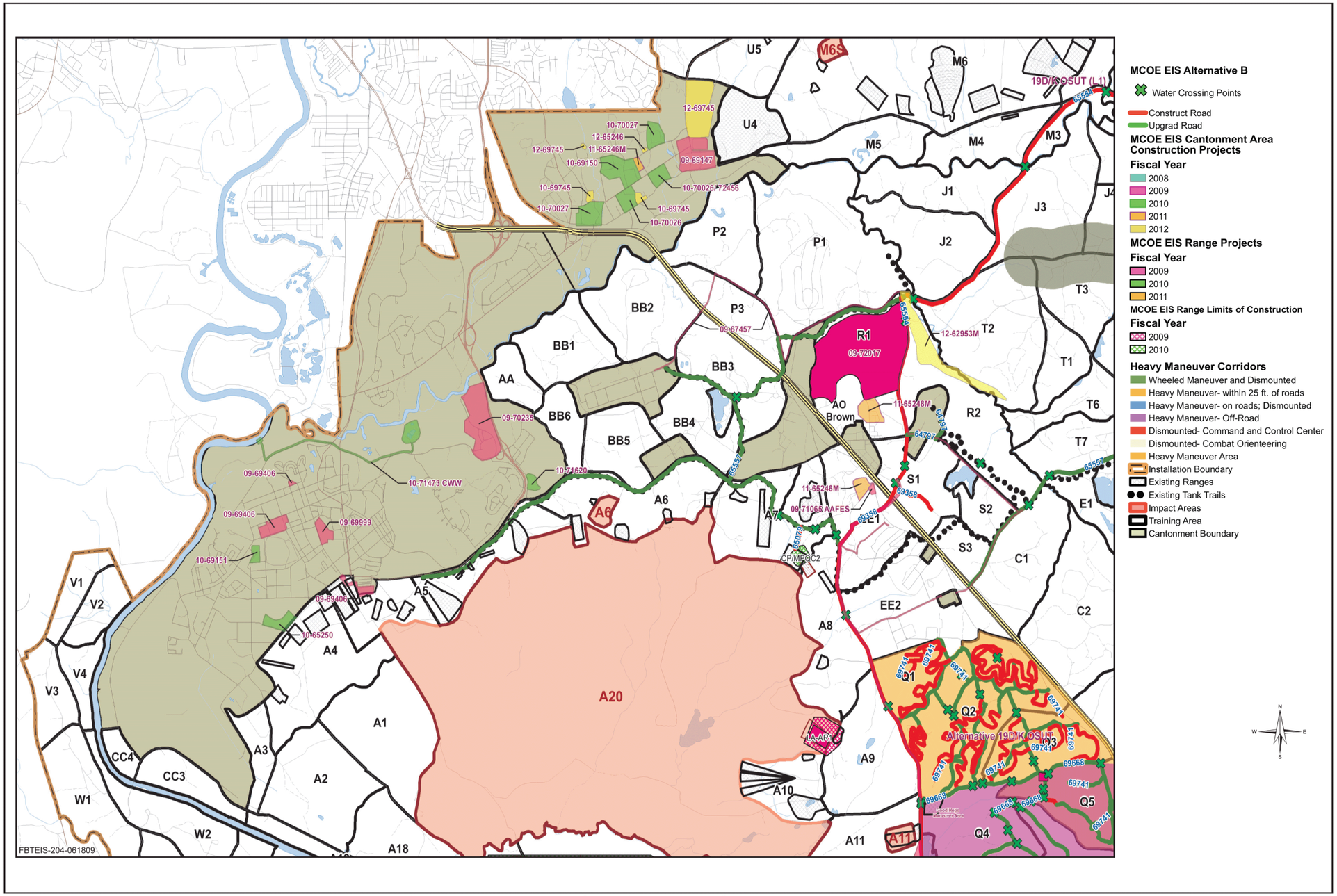


Figure ES-7: MCOE EIS Alternative B Proposed Cantonment-Area Construction

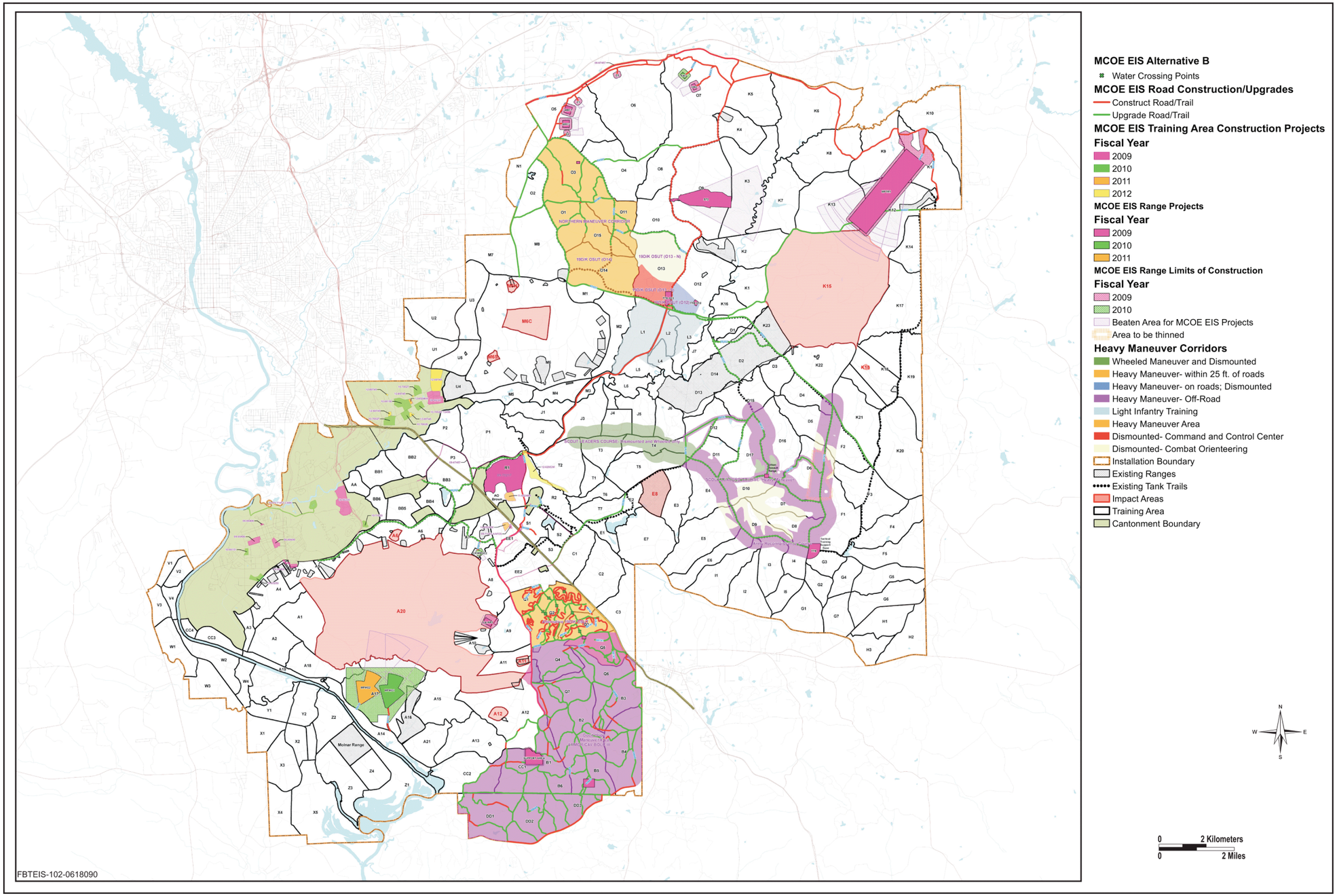


Figure ES-8: MCOE EIS Alternative B Proposed Ranges and Maneuver Training Area Construction

Table ES-3 MCOE EIS Alternative B Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	Disturbance-Area Footprint (Acres)
Installation Wide			
65554	09	Construct Training Area Roads Paved	905
67457	09	Infrastructure Support, Increment 2 (security fence and Dixie Road Expansion from Michaels Street to Sightseeing Road)	(already disturbed site)
65557	10	Repair Existing Training Area Roads, Phase 1	991
Cantonment Area—Harmony Church			
71065	09	Troop Store - AAFES (NAF)	4
65039	09	Basic 10M – 25M Firing Range 5 (Z5)	1
64460	09	Direct Support/General Support Vehicle Maintenance Facility	36
65322	09	Shop 1 Maintenance Facility	10
65246	12	Recreation Centers in Harmony Church and Sand Hill	27
65248	12	Physical Fitness Center, Harmony Church	39
62953	12	Rail Loading Facility Expansion	134
Cantonment Area—Main Post			
70235	09	Hospital Replacement	137
69999	09	Warrior in Transition Complex	17
71473	10	Water Treatment Plant Upgrade and Expansion	47
69151	10	Dining Facility to Support AST Training	10
69406	09	Unit Maintenance Facility	1
65250	10	Maneuver Battle Lab	27
71620	10	Dental Clinic Addition (Bernheim Site)	(already disturbed site)
Cantonment Area—Sand Hill			
69147	09	Trainee Complex Upgrade	65
64481	10	Blood Donor Center	12
70027	10	Classrooms With Battalion Dining Facilities	72
70026	10	Classrooms With Battalion Dining Facilities	50
72322	10	Training Barracks Complex, Phase 1	155
69150	10	Classrooms & Dual Battalion Dining Facilities	58
72324	11	Training Barracks Complex, Phase 2	Note 1
72456	11	Training Dining and Classroom Facilities. Phase 2	72
72457	11	Training Dining and Classroom Facilities. Phase 2	50
69745	12	Training Barracks Complex, Phase 3	131
65249	13	Chapel	0 (already disturbed site)
Ranges North of U.S. Highway 27/280			
72017	09	Vehicle Recovery Course (GMD)	507
65035	09	Basic 10M – 25M Firing Range 1 (Z 1)	1
65039	09	Basic 10M – 25M Firing Range 5 (Z 5)	1
65036	09	Basic 10M – 25M Firing Range 2 (Z 2)	1

Table ES-3 MCOE EIS Alternative B Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	Disturbance-Area Footprint (Acres)
Ranges North of U.S. Highway 27/280 (cont.)			
65049	09	Modified Record Fire 7 (MRF 7) – 5.56mm: M855 Ball	24
65043	09	Modified Record Fire 1 (MRF 1) – 5.56mm: M855 Ball	24
64551	09	Multi-Purpose Training Range 1 – 25mm, 120mm, 7.62mm, 5.56mm & .50 Cal	984
65033	09	Fire and Movement 2 (FM 2) – 5.56mm: M855 Ball	10
69743	09	Southern Training Area Infrastructure	583
69742	09	Northern Training Area used for existing maneuver training. No new infrastructure constructed in TA-L1, L2, and L3	Note 2
65034	10	Fire and Movement 3 (FM 3) – 5.56mm: M855 Ball	10
65383	09	Stationary Tank Range 2 (ST 2)	676
64797	09	Drivers Training Course (Access Roads)	34
Ranges South of U.S. Highway 27/280			
65078	09	Anti-Armor Tracking and Live Fire Complex	13
65079	10	Automated Combat Pistol Qualification Course	1
69358	09	Range Access Road – Good Hope Maneuver Training Area	166
69668	09	Good Hope Training Area Infrastructure	1,677
69741	09	19D/K OSUT (Heavy Mounted/Dismounted) Training in TA-Q1, Q2, Q3, and Q5	872
65070	11	Multi-Purpose Machine Gun 2 – 7.62mm & .50 Cal	238
68733	10	Multi-Purpose Machine Gun 1 – 7.62mm & .50 Cal	238

Note 1: Both PN72322 and 72324 are on the same 155-acre site.
Note 2: The Northern Training Area Infrastructure was analyzed in the BRAC/Transformation EIS (USACE 2007a).

ES 5 ARMY DECISIONMAKING PROCESS

The Army's decisionmaker will consider all relevant environmental information and public issues of concern disclosed in this EIS. In addition, he/she will seriously consider several non-environmental factors critical to the final decision such as Army directives; existing and emerging national defense needs as identified in the QDR; Soldiers and their Families' quality of life; and cost efficiencies. Then after a thorough evaluation of this information, the decisionmaker will document the decision, selecting one of the Proposed Action alternatives in a ROD, which will be signed no earlier than 30 days from publication of the final EIS Notice of Availability. In the ROD, the Army's decisionmaker considers all relevant environmental information and public issues of concern disclosed in this EIS. In addition, he/she takes into consideration several non-environmental factors critical to the final decision such as Army directives; existing and emerging national defense needs; Soldier and their Family quality of life; Fort Benning mission requirements; and cost efficiencies. Then after a thorough evaluation of this information, the decisionmaker documents the decision and announces selection of one of the alternatives. Once the ROD is finalized, the Army will forward a Notice of Availability to the *Federal Register* and make the ROD available for public review.

ES 6 ENVIRONMENTAL CONSEQUENCES

This EIS presents the existing environmental and potential environmental consequences that could result from each alternative. Under the No Action Alternative, the impacts would be those identified in the BRAC/Transformation EIS with all mitigation measures identified in the ROD being implemented to address adverse impacts. Under this proposal's Alternatives A and B there is the potential to have significant and adverse effects, depending on the resource. A summary of impacts by resource area for the No Action Alternative and MCOE Alternatives A and B is provided in Table ES-4.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Land Use and Management (Section 4.3)				
On-Post Land Use and Management-	Land use stays unchanged within the Installation. Cantonment-developed areas would increase but are consistent with existing land uses. Significant impacts due to incompatible noise levels over family housing.	Land use stays unchanged within the Installation. Cantonment-developed areas would increase but are consistent with existing land uses. Significant impacts due to incompatible noise levels over family housing similar to No Action.	Same as Alternative A.	Coordination with on-Post housing program representatives to identify minimization measures (yet to be determined).
Off-Post Land Use and Management	Land use outside Installation boundaries would not change; however, there is incompatible land uses due to noise levels resulting in significant impacts. Complaints may increase.	Similar to the No Action Alternative, there would be incompatible land uses due to noise levels causing significant impacts. In addition, consultation with USFWS calls for relocation of the Scout Leaders Course field training to a location yet to be identified, outside of Fort Benning boundaries.	Same as No Action.	Heavy maneuver training is required to occur during the hours of 4 a.m. to 12 a.m. for half of the training days and 6 p.m. to 12 p.m. for the remainder of the training days. Mitigation measures for this training include informing adjacent community of training schedule and continued implementation of existing noise management and compatible land use programs. In addition, recommend that community planners and developers provide a noise disclosure for properties that are exposed to Zone II and III noise levels from Fort Benning operations.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Aesthetic and Visual Resources (Section 4.4)				
Cantonment Areas	Minor visual impacts due to construction equipment and tree removal. No significant impacts because visual compatibility of new structures would be maintained through design and consistency with existing structures.	Same as No Action.	Same as No Action.	New construction must maintain visual continuity.
Range Areas	No impacts; visual compatibility with adjacent training lands would be maintained.	Same as No Action.	Same as No Action.	No mitigation required.
Socioeconomics (Section 4.5)				
Economic Developments and Demographics	Significant direct and indirect beneficial impacts on employment and sales volume. Minor direct and indirect beneficial impacts due to population increase.	No significant impact beyond the No Action Alternative.	No significant impact beyond the No Action Alternative.	No mitigation required.
Housing	Minor negative effects anticipated if local housing stock not able to meet growth and increases in housing costs.	No significant impact beyond the No Action Alternative.	No significant impact beyond the No Action Alternative.	No mitigation required.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Quality of Life	Significant negative impacts expected on schools if community cannot accommodate the increased population through increased funding and timely capacity expansion. Minor adverse impacts anticipated for public services such as health care, police, or fire.	No additional impacts beyond those found under the No Action Alternative.	Impacts similar to Alternative A.	No mitigation required.
Environmental Justice and Protection of Children	Noise impacts would not have a disproportionately adverse impact to minority or low income populations adjacent to the Post. No impact to children's health anticipated.	No significant impact beyond the No Action Alternative.	No significant impact beyond the No Action Alternative.	No mitigation required.
Transportation (Section 4.6)				
Main Post Cantonment Area	Significant impacts at several intersections where level of service fails in the morning and evening peak hours.	No significant impact beyond the No Action Alternative.	No significant impact beyond the No Action Alternative.	No further mitigation measures required beyond those required as a result of the BRAC/Transformation EIS. Implementation of widened roads and improved intersections, and encouraged use of travel demand management tools would mitigate transportation impacts
Kelley Hill Cantonment Area	Significant impacts at one intersection where level of service fails.	No significant impact beyond the No Action Alternative.	No significant impact beyond the No Action Alternative.	No further mitigation measures required beyond those required as a result of the BRAC/Transformation EIS and noted above for Main Post

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Sand Hill Cantonment Area	Significant impacts at two intersections where level of service fails.	No significant impact beyond those found under the No Action Alternative.	No significant impact beyond those found under the No Action Alternative.	No further mitigation measures required beyond those required as a result of the BRAC/Transformation EIS and noted above for Main Post
Harmony Church Cantonment Area	Moderate impacts to level of service during morning and evening peak hours at access control point due to construction of new interchange in Harmony Church under the Proposed Action.	No significant impact beyond those found under the No Action Alternative.	No significant impact beyond those found under the No Action Alternative.	No further mitigation measures required beyond those required as a result of the BRAC/Transformation EIS and noted above for Main Post.
Utilities (Section 4.7)				
Potable Water Supply, Wastewater System, Stormwater System, and Energy Sources	No significant impacts anticipated with implementation of all existing federal, state, and local regulatory procedures and permitting requirements.	Same as No Action.	Same as No Action.	No mitigation required.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Noise (Section 4.8)				
	Increases in noise contour levels both on- and off-Post would occur in comparison to baseline conditions, resulting in significant impacts. On-Post, about 96 family housing buildings (or about 192 sets of quarters) are exposed to Zone III noise levels. Off-Post noise complaints could increase and incompatible land uses within Zone III are introduced.	Significant impacts, similar to those found under the No Action Alternative.	Significant impacts, similar to those found under the No Action Alternative.	Off-Post, existing reporting and claim procedures for alleged noise problems due to Army operations will continue to address exposure to Zone III contours. Army suggests community adopts recommendations presented in the Installation Operational Noise Management Plan for future development. On-Post, continued practice of noise disclosures in real estate documents for on-Post residents in Zone II and III assist in minimizing the number of noise complaints. The Army, in coordination with family housing program personnel, would identify mitigation measures to attenuate on-Post Zone III noise levels.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Air Quality (Section 4.9)				
	Short-term emissions from construction would increase emissions but would not significantly affect regional air quality attainment status and no Class I PSD areas would be affected. Long-term impacts from increased range operations and maintenance activities would be minimal and would not significantly impact regional air quality attainment status or Class I PSD areas.	Same as No Action.	Same as No Action.	No mitigation required.
Hazardous and Toxic Materials and Waste (Section 4.10)				
Hazardous Materials Storage, Use, and Handling	The quantity of materials used, stored, and handled would increase; existing procedures, regulations, and facilities would be able to meet storage, use, and handling requirements. No significant impacts anticipated.	Same as No Action.	Same as No Action.	No mitigation required.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Toxic Substances Management and Hazardous Waste Management	Per current Fort Benning practice, management plans would be updated to reflect the change in mission; therefore, no significant impacts.	Similar to the No Action Alternative, all hazardous materials identified in the conversion of interior space will be abated and disposed of in accordance with current laws and regulations and all management and disposal of hazardous and toxic materials will be in accordance with current laws and regulations. Types and quantities of hazardous wastes generated would be accommodated by the existing hazardous waste management system.	Same as Alternative A.	No mitigation required.
Contaminated Sites	Significant impacts could occur if unknown contaminated sites are discovered during construction. Existing procedures for regulatory coordination and cleanup requirements would be followed to ensure no significant impacts.	Same as No Action.	Same as No Action.	No mitigation required.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Water Resources (Section 4.11)				
Surface Water, Hydrogeology/Groundwater, Floodplains, Wetlands	Impacts to water resources would not be significant as long as all permit requirements, Installation guidelines, including Best Management Practices were followed for surface water, hydrology/groundwater, and floodplains. Unavoidable wetland impacts will require mitigation. Significant impacts to wetlands can be avoided with successful wetland mitigation.	Same as No Action Alternative.	Alternative B has a greater potential for impacts to water resources due to the substantial increase in the amount of land disturbance under this alternative.	Application of existing management actions, facility design, and construction practices would minimize impacts. Use of water crossings, where needed, will be incorporated into the design process. Once operational, monitoring to identify erosion or sedimentation issues on the ranges, training areas, and tank trails would occur to ensure no significant impacts. Specific mitigation plans for impacts occurring from projects addressed in this EIS will be tailored to those impacts during the federal and state permitting process.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Geology and Soils (Section 4.12)				
Geologic and Topographic Conditions and Soils	Potentially significant impacts to the Installation's erodible soils as a result of construction and training operations without implementation of erosion control measures and Best Management Practices as outlined in state, federal laws, and Installation guidelines. All required permits would be obtained and implemented and all appropriate site-specific management practices and existing mitigation measures would be implemented to off-set these impacts. As a result, significant impacts to soils from construction and on-going and future use of the Installation's training ranges would be minimized.	Same as No Action Alternative.	Alternative B has a greater potential for impacts to these resources due to the substantial increase in the amount of land disturbance under this alternative.	Application of existing management actions, facility design, and construction practices would minimize impacts. The individual project designs will specifically tailor the exact details to control and offset impact to geologic and topographic conditions and soils.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Biological Resources (Section 4.13)				
Vegetation	The No Action Alternative could result in potential significant effects to vegetation. A substantial amount of native habitat would be lost, and disruption of ecosystem function in the disturbed areas could occur.	Same as No Action.	Alternative B would introduce further adverse impacts due to the substantial increase in the amount of land disturbance.	Continued adherence to Integrated Natural Resource Management Plan and current Conservation Branch/Land Management branch management practices and procedures would minimize impacts.
Fish, Wildlife, and other Animal Species	Species and their associated habitat would experience significant impacts due to construction and operational and training activities.	Same as No Action.	Alternative B introduces further adverse impacts due to the substantial increase in the amount of land.	Continued adherence to Integrated Natural Resource Management Plan procedures and prescribed practices would minimize significant impacts.
Special Status Species	Federally-listed species would experience significant impacts. Portions of the Randall Creek North relict trillium population would be removed but this would not likely affect the continued existence of this species. Thirty-two Red-cockaded Woodpecker (RCW) clusters would be "taken" with likely significant impacts to recovery goals. The Georgia state listed gopher tortoise would be significantly affected.	Similar to the No Action Alternative, significant impacts are expected. This alternative would result in 57 direct takes of RCW and 24 indirect takes of their clusters. Although relict trillium populations would be reduced, the densest part of the population would remain intact; therefore, in consultation with the USFWS, it was determined that it was not likely to jeopardize the continued existence of this endangered plant species. The Georgia state listed gopher tortoise would be significantly affected.	There would be direct takes of 78 RCW clusters and 12 indirect takes, resulting in greater impacts to the RCW when compared to Alternative A. Impacts to the relict trillium would be similar to Alternative A and the species existence would not be jeopardized. Similar to Alternative A, there would be gopher tortoise impacts.	Under Alternative A, all avoidance, conservation, and minimization identified in the Biological Assessment and Biological Opinion will be implemented to reduce effects on federally-listed species. Compliance with the Reasonable and Prudent Alternative developed in consultation with the USFWS will avoid a jeopardy opinion for the RCW. For the relict trillium and gopher tortoise, continued adherence to Integrated Natural Resource Management Plan procedures and Conservation/Land Management Branch management practices, relocation, as well as monitoring would minimize significant impacts.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Unique Ecological Areas (UEA)	The Prosperity Church Oak-Hickory Forest, Piedmont Interface, and Longleaf Loamhills UEAs would be significantly impacted.	Same as No Action.	Impacts would be significant and adverse compared to Alternative A due to the substantially larger amount of land disturbed affecting these resources.	Mitigation to avoid and/or minimize impacts includes siting and design to avoid sensitive resources in the UEAs. Stream crossings would be limited to the extent possible and soil stabilization BMPs implemented along roadsides. Range facilities, targets, and berms will be configured to minimize impacts to wetlands, streambanks, and sensitive vegetation within the UEAs and where possible, incorporate additional acreage that includes appropriate habitat features into existing UEAs to offset losses caused by the action alternatives. Monitoring would occur to ensure application of mitigation measures.
Cultural Resources (Section 4.14)				
Cantonment Areas and Ranges	Potential adverse impacts to an estimated 146 eligible resources and 12 historic cemeteries.	Potential adverse impacts to 100 eligible and recommended eligible cultural resources, 5 historic structures, and 8 historic cemeteries.	Potential adverse impacts to 121 eligible and recommend eligible cultural resources, 16 historic structures, and 12 historic cemeteries.	Mitigation includes avoiding sites, protecting resources from potential indirect impacts, prohibiting access to sites, and excavating and/or recovering resources. Individual measures will include protecting specific resources through the use of signs and education of Soldiers and additional specific protection measures that may be developed in consultation with the SHPO and federally-recognized American Indian Tribes.

Table ES-4: Summary of Effects of the No Action Alternative and MCOE Alternatives A and B

Resource	No Action Alternative	Alternative A (Preferred Alternative)	Alternative B	Mitigation Measures
Safety (Section 4.15)				
Public, Construction, Explosive, and Range Safety	Potential for safety risks introduced by increased weapons and ordnance use, as well as tank and heavy vehicle traffic. This would result in minor impacts. Implementation of all existing safety programs and infrastructure upgrades would ensure that no significant training and vehicle safety hazards are introduced.	Same as No Action.	Same as No Action.	No mitigation required.

TABLE OF CONTENTS

Table of Contents

EXECUTIVE SUMMARY ES-1

1.0 PURPOSE, NEED, AND SCOPE 1-1

1.1 INTRODUCTION 1-1
1.2 PURPOSE AND NEED 1-2
1.3 SCOPE OF ENVIRONMENTAL IMPACT STATEMENT 1-3
1.3.1 NEPA Context 1-5
1.3.2 Scope of Environmental Analysis 1-5
1.4 PUBLIC INVOLVEMENT 1-6
1.4.1 General Public Involvement Process 1-6
1.4.2 Notice of Intent 1-6
1.4.3 Scoping Process 1-6
1.4.4 Public Review and Comment Process 1-7
1.4.5 Final Steps in the NEPA Process 1-9

2.0 DESCRIPTION OF THE PROPOSED ACTION 2-1

2.1 INTRODUCTION 2-1
2.2 PROPOSED ACTION 2-1
2.2.1 Changes to BRAC 2005 and Transformation Actions EIS 2-1
2.2.2 Army Growth 2-4
2.2.3 Other Projects 2-5
2.3 PROPOSED CANTONMENT, RANGE, AND TRAINING AREA REQUIREMENTS 2-5
2.3.1 Cantonment Area Development 2-5
2.3.2 Range and Training Area Requirements 2-5
2.4 ARMY DECISIONMAKING PROCESS AND DECISION TO BE MADE 2-7

3.0 ALTERNATIVES 3-1

3.1 INTRODUCTION 3-1
3.2 ALTERNATIVES CONSIDERED BUT NOT ADDRESSED IN DETAIL 3-5
3.2.l Alternative Locations and Activities 3-5
3.2.2 Implementation Phasing Alternative 3-5
3.2.3 Training Students at other Army Installations Alternative 3-6
3.3 ALTERNATIVES CARRIED FORWARD 3-6
3.4 ALTERNATIVES COnsidered 3-7
3.4.1 Alternative A (preferred alternative) and Alternative B Cantonment and Training Area Development 3-7
3.4.2 Alternative B Proposed Cantonment and Training Area Development 3-10
3.4.3 No Action Alternative 3-16

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 4-1

4.1 INTRODUCTION 4-1
4.1.1 Procedural Requirements and Consultation 4-2
4.1.2 Relevant Statutes, Executive-Orders, and Permits 4-5
4.1.3 Methodology 4-7
4.2 TRAINING OPERATIONS 4-11
4.2.1 Baseline Training Conditions 4-13
4.2.2 Environmental Consequences 4-16
4.2.2.1 No Action Alternative 4-16
4.2.2.2 Alternative A (preferred alternative) 4-18
4.2.2.3 Alternative B 4-19
4.3 LAND USE AND MANAGEMENT 4-20
4.3.1 Affected Environment 4-21
4.3.1.1 Fort Benning 4-21
4.3.1.2 Off-Post 4-26
4.3.2 Environmental Consequences 4-36
4.3.2.1 No Action Alternative 4-36
4.3.2.2 Alternative A (preferred alternative) 4-37
4.3.2.3 Alternative B 4-39
4.3.3 Mitigation Measures 4-40
4.4 AESTHETICS AND VISUAL RESOURCES 4-41
4.4.1 Affected Environment 4-41
4.4.2 Environmental Consequences 4-42
4.4.2.1 No Action Alternative 4-42
4.4.2.2 Alternative A (preferred alternative) 4-47
4.4.2.3 Alternative B 4-50
4.4.3 Mitigation Summary 4-50
4.5 SOCIOECONOMICS 4-51
4.5.1 Affected Environment 4-51
4.5.1.1 Economic Development 4-51
4.5.1.2 Demographics 4-52
4.5.1.3 Housing 4-52
4.5.1.4 Quality of Life 4-53
4.5.1.5 Environmental Justice 4-56
4.5.1.6 Protection of Children 4-57
4.5.2 Environmental Consequences 4-60
4.5.2.1 No Action Alternative 4-60
4.5.2.2 Alternative A (preferred alternative) 4-63
4.5.2.3 Alternative B 4-67
4.5.3 Mitigation Measures 4-67

4.6 TRANSPORTATION 4-70
4.6.1 Affected Environment 4-70
4.6.1.1 Description of On and Off Post Roadways 4-70
4.6.1.2 Key Analysis Locations 4-75
4.6.1.3 Traffic Volume Development 4-76
4.6.1.4 Intersection Level of Service Methodology 4-76
4.6.1.5 Existing Conditions Analysis 4-76
4.6.2 Environmental Consequences 4-82
4.6.2.1 No Action Alternative 4-82
4.6.2.2 Alternative A (preferred alternative) 4-88
4.6.3 Mitigation Measures 4-92
4.7 UTILITIES 4-94
4.7.1 Affected Environment 4-94
4.7.1.1 Potable Water Supply 4-94
4.7.1.2 Wastewater System 4-94
4.7.1.3 Storm Water System 4-95
4.7.1.4 Energy Sources 4-95
4.7.1.5 Communication Systems 4-96
4.7.1.6 Solid Waste 4-96
4.7.2 Environmental Consequences 4-97
4.7.2.1 No Action Alternative 4-97
4.7.2.2 Alternative A (preferred alternative) 4-98
4.7.2.3 Alternative B 4-102
4.7.3 Mitigation Measures 4-102
4.8 NOISE 4-103
4.8.1 Affected Environment 4-106
4.8.2 Environmental Consequences 4-111
4.8.2.1 No Action Alternative 4-112
4.8.2.2 Noise Impacts under Alterantive A 4-118
4.8.2.3 Noise Impacts under Alternative B 4-121
4.8.3 Mitigation Measures 4-129
4.9 AIR QUALITY 4-125
4.9.1 Affected Environment 4-125
4.9.1.1 Ambient Air Quality Conditions 4-125
4.9.1.2 Installation Air Pollutant Emissions 4-127
4.9.2 Environmental Consequences 4-128
4.9.2.1 No Action Alternative 4-129
4.9.2.2 Alternative A (preferred alternative) and Alternative B 4-130
4.9.3 Mitigation Measures 4-132

4.10 HAZARDOUS AND TOXIC MATERIALS AND WASTE 4-133
4.10.1 Affected Environment 4-134
4.10.1.1 Hazardous Materials Storage, Use, and Handling 4-134
4.10.1.2 Toxic Substances Management 4-135
4.10.1.3 Hazardous Waste Generation and Disposal 4-136
4.10.1.4 Contaminated Sites 4-137
4.10.2 Environmental Consequences 4-138
4.10.2.1 No Action Alternative 4-138
4.10.2.2 Alternative A (preferred alternative) and Alternative B 4-138
4.10.3 Mitigation Measures 4-142
4.11 WATER RESOURCES 4-143
4.11.1 Affected Environment 4-143
4.11.1.1 Surface Water 4-144
4.11.1.2 Hydrogeology/Groundwater 4-153
4.11.1.3 River and Stream Floodplains 4-153
4.11.1.4 Stormwater Management 4-154
4.11.1.5 Sediment and Erosion Regulations 4-157
4.11.1.6 Aquatic Habitat and Wetlands 4-158
4.11.2 Environmental Consequences 4-163
4.11.2.1 No Action Alternative 4-163
4.11.2.2 Alternative A (preferred alternative) 4-164
4.11.2.3 Alternative B 4-178
4.11.3 Mitigation Measures 4-185
4.12 GEOLOGY AND SOILS 4-190
4.12.1 Affected Environment 4-190
4.12.2 Environmental Consequences 4-194
4.12.2.1 No Action Alternative 4-194
4.12.2.2 Alternative A (preferred alternative) 4-198
4.12.2.3 Alternative B 4-202
4.12.3 Mitigation Measures 4-205
4.13 BIOLOGICAL RESOURCES 4-207
4.13.1 Affected Environment 4-207
4.13.1.1 Vegetation 4-207
4.13.1.2 Fish and Wildlife 4-215
4.13.1.3 Special-Status Species 4-218
4.13.1.4 Unique Ecological Areas 4-241

4.13.2 Environmental Consequences 4-246
4.13.2.1 No Action Alternative 4-249
4.13.2.2 Alternative A (preferred alternative) 4-249
4.13.2.3 Alternative B 4-272
4.13.3 Mitigation Measures 4-280
4.13.3.1 Alternative A 4-280
4.13.3.2 Alternative B 2-282
4.14 CULTURAL RESOURCES 4-283
4.14.1 Affected Environment 4-284
4.14.1.1 Prehistoric and Historic Resources 4-284
4.14.1.2 Management 4-288
4.14.2 Environmental Consequences 4-291
4.14.2.1 No Action Alternatives 4-292
4.14.2.2 Alternative A (preferred alternative) 4-292
4.14.2.3 Alternative B 4-305
4.14.3 Mitigation Measures 4-305
4.15 SAFETY 4-307
4.15.1 Affected Environment 4-309
4.15.2 Environmental Consequences 4-313
4.15.2.1 No Action Alternative 4-313
4.15.2.2 Alternative A (preferred alternative) 4-315
4.15.2.3 Alternative B 4-315
4.15.3 Mitigation Measures 4-315
4.16 CUMULATIVE EFFECTS 4-318
4.16.1 Army 11-Step Process 4-318
4.16.1.1 Step 1: Identification of Significant Issues and Assessment Goals ... 4-318
4.16.1.2 Step 2: Geographic Scope of Analysis 4-319
4.16.1.3 Step 3: Analysis Time Frame 4-319
4.16.1.4 Step 4: Other Actions Affecting VECs 4-319
4.16.2 Past and Present Actions 4-319
4.16.3 Reasonably Foreseeable Future Actions within the ROI 4-325
4.16.4 Steps 5 and 6: Characterization of VECs and Their Response to change 4-329
4.16.5 Steps 7 and 8:Baseline Condition and Cause and Effect Relations between Human Activities and VECs 4-330
4.16.6 Step 9: Determination of the Magnitude and Significance of Cumulative Effects On VECs 4-330
4.16.7 Steps 10 and 11: Mitigation and Monitoring 4-337

4.17 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES 4-339
4.17.1 Irreversible and Irretrievable Commitments Identified 4-339
4.17.2 Unavoidable Adverse Effects 4-339
4-17.3 Unavoidable Effects to Global Warming 4-340

5.0 LIST OF PREPARERS 5-1

6.0 NOTIFICATION LIST 6-1

7.0 REFERENCES CITED 7-1

8.0 PERSONS CONSULTED 8-1

9.0 ACRONYMS AND ABBREVIATIONS 9-1

LIST OF TABLES

Table 3.1-1 BRAC/Transformation FY07and FY08 Projects included in Baseline Conditions 3-2
Table 3.3-1 MCOE Screening Criteria 3-6
Table 3.4-1 MCOE EIS Alternative A (preferred alternative) Proposed Projects 3-8
Table 3.4-2 MCOE EIS Alternative B Proposed Projects 3-15
Table 3.4-3 MCOE EIS No Action Alternative Projects 3-17
Table 4.1-1 Other Major Environmental Statues, Regulations, and Executive Orders Applicable to Federal Projects 4-6
Table 4.1-2 VEC's Screening Matrix for Alternatives A and B as of November 2007 4-9
Table 4.2-1 Baseline Workforce Levels and Student Populations 4-12
Table 4.2-2 Baseline Training Throughput 4-13
Table 4.2-3 Baseline Annual Weapons Use 4-14
Table 4.2-4 Baseline Vehicle Inventory 4-14
Table 4.2-5 MCOE EIS No Action Alternative Workforce Levels and Student Populations 4-16
Table 4.2-6 MCOE EIS No Action Alternative Training Throughput 4-17
Table 4.2-7 MCOE EIS No Action Alternative Annual Weapons Use (Rounds Fired) 4-17
Table 4.2-8 MCOE EIS No Action Alternative Armor School Vehicle Inventory 4-18
Table 4.2-9 MCOE EIS Alternatives A and B Projected Annual Weapons Use (Rounds Fired) 4-19
Table 4.3-1 Baseline Community Support Facilities 4-22
Table 4.3-2 Baseline Assets 4-23
Table 4.3-3 Baseline Military Housing 4-23
Table 4.3-4 Land Use Categories 4-24
Table 4.5-1 ROI Population Growth 1980-2007 4-52
Table 4.5-2 Housing Characteristics for the ROI (2000 Census) 4-52

Table 4.5-3 Distribution of Fort Benning Housing by Type 4-53
Table 4.5-4 2003-2004 School Year Public Education Statistics 4-54
Table 4.5-5 Race, Ethnicity and Poverty Statutes by 2000 Census Block 4-57
Table 4.5-6 Alternative A: EIFS Inputs and Results 4-64
Table 4.5-7 RTV Values for Sales Volume, Income, Employment, and Population 4-64
Table 4.6-1 Signalized Intersection LOS Criteria 4-77
Table 4.6-2 Unsignalized Intersection LOS Criteria 4-77
Table 4.6-3 Existing Conditions LOS 4-79
Table 4.6-4 No Action Alternative LOS 4-83
Table 4.6-5 Overall LOS Comparison 4-85
Table 4.6-6 Alternative A & B Cantonment &Training Area Development Traffic Impacts 4-88
Table 4.8-1 Common Sound Levels Measured in Decibels 4-104
Table 4.8-2 Zone and Compatibility 4-105
Table 4.8-3 Acres within Baseline Small-Caliber Noise Zones (Pk) 4-110
Table 4.8-4 Acres within Baseline Large-Caliber Noise Zones (CDNL) 4-110
Table 4.8-5 No Action Alternative: Acres within Small-Caliber Noise Zones (Pk) 4-114
Table 4.8-6 No Action Alternative Acres within Large-Caliber Noise Zones (CDNL) 4-114
Table 4.8-7 Alternative A: Acres within Small-Caliber Noise Zones (Pk) 4-118
Table 4.8-8 Alternative A: Acres within Large-Caliber Noise Zones (CDNL) 4-118
Table 4.8-9 Alternatives B: Acres within Small-Caliber Noise Zones (Pk) 4-121
Table 4.8-10 Alternatives B: Acres within Large-Caliber Noise Zones (CDNL) 4-121
Table 4.8-11 On-Post Large Caliber Noise Zones (CDNL): Comparison of Baseline, No Action and Alternatives A and B (Acres) 4-124
Table 4.8-12 Off-Post Large Caliber Noise Zones (CDNL): Comparison by County of Baseline, No Action, and Alternatives A and B (Acres) 4-1241
Table 4.9-1 Georgia and National Ambient Air Quality Standards 4-126
Table 4.9-2 Total Baseline Pollutant Emissions (tons/year) 4-126
Table 4.9-3 Fort Benning 2006 Criteria Pollutant Emissions (tons/year) 4-128
Table 4.9-4 No Action Alternative Air Emissions Estimates (tons/year) 4-129
Table 4.9-5 No Action Alternative Operations/Maintenance Criteria PollutantEmissions (tons/year) 4-129
Table 4.9-6 Projected Criteria Pollutant Construction Emissions (tons/year) 4-130
Table 4.9-7 Control Options for General Construction Open Sources of PM_{10} 4-131
Table 4.10-1 Proposed Projects Potentially Generating Toxic Substances 4-140
Table 4.11-1 Impaired Streams at Fort Benning 4-151
Table 4.11-2 Aquatic Habitat Acreage 4-158
Table 4.11-10 Aquatic Habitat Potentially Impacted by Alternative A 4-164
Table 4.11-11 Wetlands Potentially Impacted by Alternative A 4-164

Table 4.11-5 Potential Water Source Impacts (Harmony Church Cantonment Area) Alternative A....4-166
Table 4.11-6 Potential Water Source Impacts (Sand Hill Cantonment Area) – Alternative A....4-167
Table 4.11-7 Potential Water Source Impacts (Main Post Cantonment Area) – Alternative A....4-168
Table 4.11-8 Potential Water Source Impacts (Ranges North of U.S. Highway 27/280) Alternative A....4-169
Table 4.11-9 Potential Water Source Impacts (Ranges South of U.S. Highway 27/280) Alternative A....4-172
Table 4.11-10 Water Crossing Proposed with Alternative A....4-172
Table 4.11-11 Potential Water Source Impacts (Good Hope Maneuver Area) – Alternative A....4-173
Table 4.11-12 Aquatic Habitat Potentially Impacted by Alternative A....4-175
Table 4.11-13 Wetlands Potentially Impacted by Alternative A....4-176
Table 4.11-14 Potential Water Source Impacts (Harmony Church Cantonment Area) by by Alternative B....4-178
Table 4.11-15 Potential Water Source Impacts (Sand Hill Cantonment Area) – Alternative B....4-179
Table 4.11-16 Potential Water Source Impacts (Main Post Cantonment Area) – Alternative B....4-180
Table 4.11-17 Potential Water Source Impacts (Ranges North of U.S. Highway 27/280) Alternative B....4-181
Table 4.11-18 Potential Water Source Impacts (Ranges South of U.S. Highway 27/280) Alternative B....4-183
Table 4.11-19 Aquatic Habitat Potentially Impacted by Alternative B....4-184
Table 4.11-20 Wetlands Potentially Impacted by Alternative B....4-184
Table 4.12-1 Geologic Formation Descriptions....4-191
Table 4.12-2 Soil Series Descriptions....4-193
Table 4.12-3 Potential Soil Association Impacts (Ranges North of U.S. Highway 27/280) Alternative A....4-199
Table 4.12-4 Coverage of Soil Associations per Total Area of Alternative A Actions....4-201
Table 4.12-5 Coverage of Soil Associations per Total Area of Alternative B Actions....4-203
Table 4.12-6 Table 4.12-6: Potential Soils Association Impacts (Ranges North of U.S. Highway 27/280)–Alternative B....4-204
Table 4.13-1 Upland Vegetation Acreage (Ecological Groups)....4-209
Table 4.13-2 Plant Species of Conservation Concern....4-223
Table 4.13-3 Special-Status Animal Species....4-230
Table 4.13-4 Potentially Affected Unique Ecological Areas....4-242
Table 4.13-5 Effects of Habitat Loss on Fort Benning Migratory Bird Species of Concern....4-241
Table 4.13-6 Vegetation Impacted by Alternative A....4-250

Table 4.13-7 Yearly Acres of Upland Vegetation Affected by Alternative A 4-250
Table 4.13-8 State-Listed Species Impacted by Alternative A 4-267
Table 4.13-9 Unique Ecological Areas Impacted by Alternate A 4-271
Table 4.13-10 Upland Vegetation Impacted by Alternative B 4-273
Table 4.13-11 Yearly Acres of Upland Vegetation Affected by Alternative B 4-274
Table 4.13-12 State-Listed Species Impacted by Alternative B 4-277
Table 4.13-13 Unique Ecological Areas Impacted by Alternative B 4-279
Table 4.14-1 Eligible and Unevaluated Archaeological Resources within the APE 4-294
Table 4.14-2 Eligible Architectural Resources within the APE 4-302
Table 4.14-3 Cemeteries within the APE 4-303
Table 4.14-4 Cultural Resources Affected Under the Action Alternatives 4-304
Table 4.15-1 Baseline Annual Weapons Use 4-310
Table 4.16-1 Trip Generation Comparison – Cumulative versus No Action Alternative 4-333
Table 4.16-2 Traffic at Two ACPs under No Action and Action Alternatives 4-334

LIST OF FIGURES

Figure 1.3-1 Fort Benning Vicinity 1-4
Figure 2.2-1 Fort Benning Cantonment Areas 2-2
Figure 2.2-2 MCOE EIS Ranges and Maneuver Training Areas Baseline Conditions 2-3
Figure 3.1-1 MCOE EIS Ranges and Maneuver Training Areas Baseline Conditions 3-3
Figure 3.4-1 MCOE EIS Alternative A Proposed Cantonment Area Construction 3-11
Figure 3.4-2 MCOE EIS Alternative B Proposed Cantonment Area Construction 3-12
Figure 3.4-3 Alternative A Proposed Ranges and Maneuver Training Area Construction 3- 13
Figure 3.4-4 MCOE EIS Alternative B Proposed Ranges and Maneuver Training Area Construction 3-14
Figure 3.4-5 MCOE EIS No Action Alternative Cantonment Area 3-19
Figure 3.4-6 MCOE EIS No Action Alternative Ranges and Maneuver Training Areas 3-20
Figure 4.3-1 Projected Regional Urbanization 4-28
Figure 4.3-2 Region of Influence for Land Use in Muscogee and Chattahoochee Counties 4-31
Figure 4.3-3 Existing Land Use Cover Data for Counties in the Vicinity of Fort Benning 4-34
Figure 4.4-1 Fort Benning Visual Districts and Cantonment Areas 4-41
Figure 4.5-1 Census Blocks Adjacent to Fort Benning 4-58
Figure 4.5-2 Baseline and No Action Alternative Noise Zones 4-62
Figure 4.5-3 Census Blocks under Small-Caliber Noise Zones—Alternative A 4-68
Figure 4.5-4 Census Blocks under for Large-Caliber Noise Zones—Alternative B 4-69
Figure 4.6-1 Fort Benning Access Control Points 4-72
Figure 4.6-2 Existing Condition LOS, AM Peak 4-80

Figure 4.6-3 Existing Condition LOS, PM Peak 4-81
Figure 4.6-4 LOS Resulting From No Action Alternative: AM Peak 4-86
Figure 4.6-5 LOS Resulting From the No Action Alternative: PM Peak 4-87
Figure 4.8-1 Baseline Noise Contour Levels (Pk) Generated from Small-Caliber Weapons 4-107
Figure 4.8-2 Baseline Noise Contour Levels (CDNL) Generated from Large-Caliber Weapons 4-108
Figure 4.8-3 Baseline Noise Contour Levels (DNL) Generated from Aircraft at Lawson AAF 4-109
Figure 4.8-4 Common Construction Noise Levels 4-13
Figure 4.8-5 Small-Caliber Noise Levels (Pk) under the No Action Alternative 4-115
Figure 4.8-6 Large-Caliber Noise Levels (CDNL) under the No Action Alternative 4-116
Figure 4.8-7 Alternative A Projected Noise Levels (Pk) Generated from Small-Caliber Weapons 4-119
Figure 4.8-8 Alternative A Projected Noise Contour Levels (CDNL) Generated from Large-Caliber Weapons 4-120
Figure 4.8-9 Alternative B Projected Noise Levels (Pk) Generated from Small-Caliber Weapons 4-122
Figure 4.8-10 Alternative B Projected Noise Contour Levels (CDNL) Generated from Large-Caliber Weapons 4-123
Figure 4.11-1 Fort Benning Watershed Management Units 4-145
Figure 4.11-2 Potentially Affected Surface Waters Identified – Alternatives A and B 4-149
Figure 4.11-3 Aquatic Ecological Groups – Northern Installation 4-159
Figure 4.11-4 Aquatic Ecological Groups – Southern Installation 4-160
Figure 4.11-5 Water Crossings in the Vicinity of Good Hope Maneuver Area 4-174
Figure 4.12-1 Soil Texture Map Fort Benning 4-192
Figure 4.12-2 Impacted Soils No Action Alternative 4-197
Figure 4.13-1 Upland Ecological Groups – Northern Installation 4-210
Figure 4.13-2 Upland Ecological Groups – Southern Installation 4-211
Figure 4.13-3 Known Occurrence of Federally Listed Species and Unique Ecological Areas 4-219
Figure 4.13-4 Known Occurrences of State Listed Species and Unique Ecological Areas 4-220
Figure 4.13-5 Red-cockaded Woodpecker Clusters Under Alternative A 4-235
Figure 4.13-6 Red-cockaded Woodpecker Clusters Under Alternative B 4-236
Figure 4.15-1 Typical SDZs 4-309
Figure 4.15-2 Baseline SDZs 4-312
Figure 4.15-3 SDZs under No Action Alternative 4-314
Figure 4.15-4 SDZs under Alternative A 4-316
Figure 4.15-5 SDZs under Alternative B 4-317
Figure 4.16-1 ACUB Priority Areas 4-322

VOLUME II

PUBLIC COMMENTS

1.0 Introduction……1

2.0 Comment Response Process……...1

3.0 Locating Your Comment……2

4.0 Locating Responses to Comments……2

APPENDICES

A Notice of Intent A-1

B Socioeconomic Modeling B-1

C Transportation Methodology C-1

D Operational Noise Data D-1

E Air Quality Modeling E-1

F Biological Assessment Addendum and Opinion F-1

G Cultural Resources G-1

CHAPTER 1

PURPOSE, NEED, AND SCOPE

1.0 PURPOSE, NEED, AND SCOPE

1.1 INTRODUCTION

In November 2005, the Army announced its intent to implement the Base Realignment and Closure (BRAC) 2005 recommendation at Fort Benning, Georgia (GA). Under this recommendation, the Armor Center and School would relocate from Fort Knox, Kentucky to Fort Benning and eventually consolidate with the Infantry Center and School to form the Maneuver Center of Excellence (MCOE). In addition to the MCOE establishment, the Army prepared the BRAC 2005 and Transformation Actions Environmental Impact Statement (referred to as the BRAC/Transformation EIS, action, or projects) to evaluate both BRAC 2005 and Transformation Actions. In November 2007 a Record of Decision (ROD) announced the preferred alternative to implement the BRAC-directed and discretionary decisions, and Transformation Actions (i.e., Army Modular Force [AMF] initiatives, Global Defense Posture Realignments [GDPR], and other Army Stationing activities) for those projects that were funded, programmed, and/or planned through the Fiscal Year (FY) 2013. Those projects that were identified as reasonably foreseeable into FY14, but were not funded nor programmed at time of EIS publication or ROD announcement, were evaluated for their potential cumulative effects. Since the November 2007 ROD, however, projects that were reasonably foreseeable in FY14 have now been funded, programmed, and/or planned, and new projects identified. In addition, some of the projects, originally identified in the FY08 to FY13 timeframe, have changed in location, size, and/or timing and these changes are substantial enough to require a re-evaluation. None of these project changes, however, impacts the ability of Fort Benning to complete the BRAC-directed actions by September 2011. The BRAC-directed actions must be completed by the 2011 BRAC law deadline.

During the same timeframe as the BRAC and Transformation actions were being evaluated, the Army announced its decision to increase its overall size (USAEC 2008) while continuing to restructure its forces in accordance with modular Transformation decisions (USACE 2002a). The permanent increase in the Army end strength, which is being implemented in accordance with Congressional authorizations, allows the Army to realign its force structure (e.g., modular forces) so that it is capable of meeting national security and defense objectives, implements Quadrennial Defense Review (QDR) recommendations (DoD 2006), sustains unit equipment and training readiness, and eases the deployment burden on its Soldiers and Families (USAEC 2007).

Through increased numbers and unit reconfigurations, the Army's operational (e.g., combat) readiness is enhanced by giving Soldiers more time to train and maintain their equipment, allowing Soldiers and their Families to spend more time together at home station between deployments, and ensuring the nation has greater capability to respond to increased threats (such as terrorism) both here and abroad. The impacts of this growth were analyzed in the Programmatic EIS (PEIS) for Army Growth and Force Structure Realignment (USAEC 2007) and the Army's ROD was formally announced in the *Federal Register* in January 2008 (USAEC 2008). For Fort Benning, this growth primarily translates into increased student

numbers (or throughput) undergoing training at the Armor and Infantry Schools, Basic Officers Leaders Course, Officer Candidate School, and Army Airborne School.

The Proposed Action, therefore, includes construction, operation, and maintenance of facilities and training areas (including assets such as ranges and maneuver areas) to support those projects that have either been added or have substantially changed in location or size from what was originally analyzed in the BRAC/Transformation EIS. In addition, the Proposed Action includes adding facilities and training areas to support the increased throughput of military personnel and students associated with Grow the Army missions.

The Proposed Action is presented in Chapter 2.0 of this EIS; Alternatives, including the No Action Alternative, are described in Chapter 3.0. Chapter 4.0, Affected Environment and Environmental Consequences, presents the potential environmental and socioeconomic effects of the action alternatives when compared to baseline and the No Action Alternative conditions. Chapter 4.0 also addresses the potential for cumulative effects and mitigation measures where applicable.

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to:

- accommodate newly identified requirements for Armor School training;
- re-evaluate projects that have moved or substantially changed from those evaluated in the BRAC/Transformation EIS (USACE 2007a)
- implement the decisions taken by the Army for growth, and
- support the MCOE standup.

The overarching need for the Proposed Action is to provide sufficient operational facilities, training areas (including ranges and maneuver areas), and infrastructure to accommodate the consolidated Armor and Infantry mission of the MCOE and the increased military personnel and students due to Army Growth. The Army plans to meet this need by minimizing land use incompatibilities and balancing the military readiness mission with a sustained natural environment.

In accordance with 40 Code of Federal Regulation (CFR) Section 1502.4 of the National Environmental Policy Act (NEPA) implementing regulation, and the Army NEPA Regulation (32 CFR 651, also known as Army Regulation [AR] 200-2), the Army has determined that the BRAC/Transformation actions that have been reconfigured and/or newly identified, funded, planned and/or programmed as well as those projects associated with the MCOE and Army Growth are all activities closely related to each other both in location and time on Fort Benning. Their potential environmental effects are, therefore, being evaluated together in this independent EIS.

1.3 SCOPE OF ENVIRONMENTAL IMPACT STATEMENT

This EIS identifies, documents, and evaluates environmental effects of activities at Fort Benning, GA in accordance with the President's Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508) and the Army NEPA Regulation. The purpose of the EIS is to inform decisionmakers and the public of the possible and probable environmental consequences of the Proposed Action and alternatives and associated mitigation. The range of actions, alternatives, and impacts considered in this EIS are intertwined with the analysis requirements found in the following EISs and related RODs: the Final BRAC/Transformation EIS (USACE 2007a), the Programmatic EIS for Army Growth and Force Structure Realignment (USAEC 2007), and Final Programmatic EIS for Army Transformation (USACE 2002b). As further described below, the scope of this EIS includes the geographic area potentially influenced by the Proposed Action as well as the area of potential environmental effect, which varies by resource.

Fort Benning consists of 181,275 acres of federally-owned land south and east of Columbus, GA, south of Phenix City, Alabama (AL), on the banks of the Chattahoochee River (Figure 1.3-1). Virtually all of the training facilities and 93 percent of the total land area are in Georgia, within Chattahoochee and Muscogee counties. The remaining southwestern corner of the Installation, approximately 12,000 acres, is located in Russell County, AL. Among Department of Defense (DoD) installations, Fort Benning is the sixth largest in terms of land area and the third largest in terms of troop numbers. As of November 2007, there were 17,771 military personnel, 8,690 civilian employees, and 9,386 students (daily average of the number of students being trained on any one day, based on a total annual attendance) stationed at Fort Benning (USACE 2007a). Following the complete stand up of the BRAC/Transformation activities, an additional 5,605 military personnel, 2,545 civilians and/or contractors, and a daily average number of 7,238 students will be added to Fort Benning (USACE 2007a, 2007b). This increases the total Fort Benning population (not including family members and dependents) to a total of 35,837 military, civilian, and contractor personnel, as well as 16,624 students (daily average) (USACE 2007a, 2007b). In addition, a temporary increase in Army end strength, authorized in advance of the Army Growth ROD (USAEC 2008), has resulted in an estimated maximum increase of 2,640 in the average daily number of students at Fort Benning (personal communication, Brown 2008). This temporary increase has now been authorized by Congress to be established on a permanent basis and is included in this EIS. Please note that these numbers represent a snap-shot in time and may change as Army missions evolve.

Under the Proposed Action, Fort Benning would increase active-duty military personnel, receive additional students; and support increased training requirements which would involve:

- constructing new facilities and renovating/upgrading existing facilities and infrastructure;
- constructing, reconfiguring, and/or modifying ranges, training areas, and maneuver lands; and
- increasing use on training ranges and maneuver areas.

Further definition of these projects is found in both Chapter 2 (Description of the Proposed Action) and Chapter 3 (Alternatives).

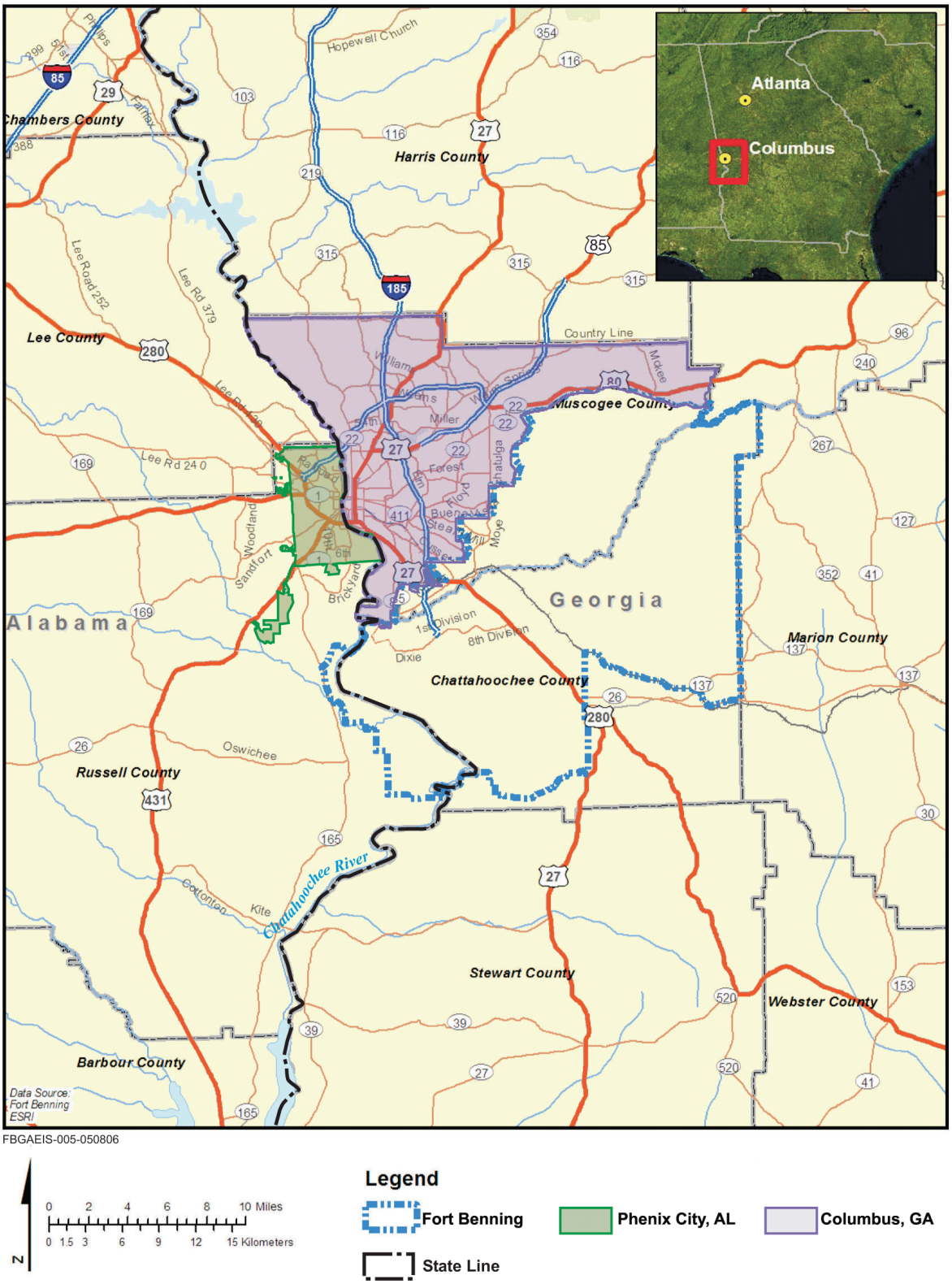


Figure: 1.3-1: Fort Benning Vicinity

1.3.1 NEPA Context

In the BRAC/Transformation EIS (final), BRAC-directed and discretionary actions, as well as other Transformation actions, were evaluated for their potential impacts under two action alternatives and compared to the No Action Alternative (USACE 2007a); the subsequent ROD selected the preferred Alternative B for implementation (USACE 2007b). The final EIS and associated Biological Assessment (as well as the decisions found in the ROD and conclusions in the Biological Opinion) pertained to specific projects under the BRAC/Transformation preferred alternative; however, since the publication of the final EIS and ROD, some projects have changed location or grown in size and, therefore, warranted another hard look. In addition, projects that were identified originally as reasonably foreseeable in the FY14 timeframe, but were not funded, programmed, and/or planned, have now become funded, programmed, and/or planned; and the Army feels that they need to be re-evaluated for their potential impacts. For both the Army Growth and BRAC/Transformation actions, the resultant RODs called for site-specific NEPA analyses to address any major actions that would be required (USAEC 2008, USACE 2002a). This EIS fulfills the Fort Benning NEPA documentation required for the BRAC/Transformation actions as well as those actions associated with Army Growth.

1.3.2 Scope of Environmental Analysis

The Army's NEPA Regulation calls for the environmental analysis to be proportionate to the nature and scope of the action, the complexity and level of anticipated effects on important resources, and the capacity of Army decisions to influence those effects in a productive, meaningful way from the standpoint of environmental quality. This EIS analysis is necessarily broad, and commensurate with the planning horizon and diverse array of actions associated with Proposed Action. The actual process of change at Fort Benning began with implementation of the BRAC/Transformation actions in FY06 and will continue through FY13. Specific activities and related timeframes and locations for each of the MCOE projects has been identified to the fullest extent possible for those occurring through 2013; however, while projects and locations have been identified for those occurring after 2011, the timing, scope, and location may change due to Congressional funding or other considerations. To conservatively evaluate impacts, the approach taken here was to conduct analysis at the scale appropriate for each resource category. For instance, at a habitat level for those impacts that may affect threatened and endangered species, at the watershed level for water quality impacts, or at the regional level for air quality impacts. This approach assisted in coordination with participating regulatory agencies such as the U.S. Fish and Wildlife Service (USFWS) and Georgia Environmental Protection Division (GEPD).

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, attorneys, and military technicians has analyzed the Proposed Action and alternatives, evaluated their potential impacts, and identified mitigation measures to minimize adverse impacts. Environmental resources addressed in this EIS are land use, aesthetics and visual resources, noise, socioeconomics, transportation, utilities, hazardous and toxic substances and waste, air quality, water resources, geology and soils, biological and cultural resources, and safety.

1.4 PUBLIC INVOLVEMENT

The Army invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the Proposed Action, including minority, low-income, and/or disadvantaged groups, are urged to participate in the decision-making process.

1.4.1 General Public Involvement Process

The term "public" is used to describe individuals who reside in communities near the project proposal area or who might be interested or affected by the Proposed Action; "stakeholders" include federally-recognized American Indian Tribes (Tribes) associated with the Fort Benning area; federal, state, and local governmental agencies with regulatory authority over Fort Benning (e.g., USFWS and GEPD); special interest groups with a charter involving environmental or military matters; and any other person that may have a particular interest in Fort Benning.

Public participation opportunities with respect to this EIS and decision making on the Proposed Action are guided by Army NEPA regulation that requires the preparation and implementation of a Public Involvement Plan to guide the public and stakeholder involvement process throughout the EIS process. The Plan is available upon request in hard copy from Mr. John Brent, Fort Benning Directorate of Public Works, Environmental Division, Bldg #6 (Meloy Hall), Room 310, Fort Benning, GA 31905, or by visiting the website at https://www.benning.army.mil/EMD/program/legal/index.htm.

1.4.2 Notice of Intent

The Army published a Notice of Intent (NOI) announcing this Proposed Action in the *Federal Register* on March 18, 2008 (Volume 73, Number 53, Pages 14459-14460) (Appendix A). The NOI was announced in the *Ledger-Enquirer* on March 21, 2008 in the *Tri-County Journal* on March 26, 2008 and in the *Bayonet* on March 28, 2008.

1.4.3 Scoping Process

EIS Mailing List

A mailing list was developed for this EIS; it includes federal and state agencies, elected officials, federally recognized American Indian Tribal representatives, interest groups, libraries, and media points of contact (see Chapter 6). This list was continually updated to reflect newly elected officials, agency representation, and public requests.

Public Scoping Process

Scoping is an early and open process for 1) actively bringing the public into the decision-making process, 2) determining the scope of issues to be addressed, and 3) identifying the major issues related to a Proposed Action (40 CFR 1501.7). CEQ and Army NEPA regulations require a scoping process in the development of an EIS. The scoping period began on April 2, 2008 with the announcement of the

scoping meeting and comment period in the local Columbus newspapers, starting with *Ledger-Enquirer* on April 2. The scoping meeting was held on April 22, 2008 at Founders Hall, Columbus State University in Columbus, GA; eight people from the general public attended. Both at the meeting, and in advertisements, the public was invited to provide comments and that comments would be accepted throughout the NEPA process, but scoping comments were encouraged to be submitted no later than May 1, 2008.

Scoping Summary of Issues and Concerns

While a court reporter and written comment sheets were available for the public to submit their comments at the meeting, none were received. There were, however, several issues and questions mentioned to Army personnel which included: concerns about noise emanating from the Oscar Complex ranges; locations where construction access roads would be established; and a question regarding the recommissioning of Fort Benning's water treatment plant and where this plant would draw water. Specifically, Columbus Water Works' (CWW) originally-submitted proposal indicates new pipes would be installed to Lake Oliver to support Fort Benning's requirements; however, the currently proposed pipe location would be downstream of the sewage discharge point and expose Fort Benning to potential hazards if the water is not remediated through tertiary sewage treatment. The commenter strongly recommended that consideration be given to using Upatoi Creek, where Fort Benning's water supply has historically been drawn for the treatment plant.

1.4.4 Public Review and Comment Process

The Army prepared the draft EIS and the U.S. Environmental Protection Agency (USEPA) published a Notice of Availability (NOA) for the draft EIS in the *Federal Register* on December 12, 2008. Official notification of the public comment period began with this NOA. The 45-day comment period provided an opportunity for early public and agency participation on the EIS prior to a decision being made by the responsible Army official. On December 12, the NOA was announced in three local newspapers *Columbus Ledger Enquirer, Tri-County News,* and the *Bayonet.* Advertisements ran three times in each of the three newspapers prior to the January 13, 2009 public meeting. The information contained in the advertisements included the date, time, and location of the meeting; the meeting format; repositories where the draft EIS could be reviewed; website where the document was available electronically; duration of comment period; and contact information.

In accordance with NEPA and CEQ regulations, the Army made reasonable accommodation for public review of the draft EIS. The draft EIS (in either hard-copy or compact disc format) was sent to over 200 members of the general public; elected officials; federal, state, and local officials; and Tribal representatives. The draft EIS was sent to seven local libraries as well as the Fort Benning public library, it was available through the internet, and the public could receive a copy by contacting the Fort Benning representative noted on the advertisements.

Public Comment Period

During the public comment period, a meeting was held and set up in an open-house format with informative posters and fact sheets. Fort Benning personnel staffed the displays and other Army staff were available to answer any questions the public might have on the analysis presented in the draft EIS. A total of three individuals and one agency representative attended the meeting. Out of this total, only one individual provided an oral comment to the court reporter; no written comments were submitted at the meeting. During the 45-day comment period, which ended on January 26, 2009, three members of the public and seven agencies provided comments.

Comments received ranged from thanking the Army for providing all the information found in the draft EIS, to specific criticisms of and questions about particular analyses. Each comment was reviewed and considered. Volume II provides copies of all comments with the relevant issues marked with brackets; responses to the bracketed comments are also included in Volume II.

Much of this final EIS (Volume I) remains substantially the same as the draft EIS; however, in accordance with 40 CFR 1503.4, some analytical supplements, improvements, or modifications and factual corrections have been made in response to comments. Since the draft was announced in the *Federal Register* on December 12, 2008, changes have occurred to preferred Alternative A, primarily in response to the formal consultation process with the USFWS. These changes have resulted in modifications to Alternatives A and B. Chief among these changes, and pursuant to the Biological Opinion, is that the Army would mitigate impacts of Alternative A by relocating training associated with the Scout Leaders Course field training, an MCOE-related heavy mechanized training course, from the Southern Maneuver Training Area to an off-Post site yet to be selected. This relocation would take place within 5 years from the start date of Scout Leaders Course. To fulfill this mitigation measure, there could be a potential need to acquire land; however, this measure has just been determined through consultation. It is, therefore, too early in the process to have specific sites identified. The Army recognizes that if training were to take place at a site other than Fort Benning, the appropriate level of NEPA documentation would need to be undertaken to evaluate the potential impacts of this training to land uses; socioeconomics; transportation and traffic; biological, soils, and cultural resources to name just a few.

1.4.5 Final Steps in the NEPA Process

The final two steps in the NEPQ process include publication of the EIS in its final format and the ROD. As mentioned earlier, the final EIS is a revision of the draft, and includes consideration of all relevant public and agency comments and the Army's responses, and provides the decisionmaker a comprehensive review of the alternatives, their environmental impacts, and mitigation measures to minimize these impacts. The last step in the NEPA process occurs no earlier than 30 days after publication of the final EIS with the ROD announcement. In the ROD, the Army's decisionmaker considers all relevant environmental information and public issues of concern disclosed in this EIS. In addition, he/she takes into consideration several non-environmental factors critical to the final decision such as Army directives; existing and emerging national defense needs; Soldier and their Family quality of life; Fort Benning mission requirements; and cost efficiencies. Then after a thorough evaluation of this information, the decisionmaker documents the decision and announces selection of one of the alternatives.

CHAPTER 2

DESCRIPTION OF THE PROPOSED ACTION

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 INTRODUCTION

This section identifies the Army's Proposed Action to carry out the BRAC/Transformation projects that have been relocated or grown in size, and to support establishment of facilities and training assets for the MCOE standup and Army Growth.

2.2 PROPOSED ACTION

Under the Proposed Action, the Army would construct, operate, and maintain additional facilities and training areas (including ranges and maneuver areas) in support of the purpose and need identified in Chapter 1. Construction would occur within the Georgia boundaries of Fort Benning; none would be implemented within the Alabama portion of the Installation. The proposed community services, personnel support, classroom, barracks, and dining facilities would be constructed in three of the four cantonment areas: Main Post, Sand Hill, and Harmony Church (Figure 2.2-1). Figure 2.2-2 presents baseline conditions of training lands at Fort Benning. As with the BRAC/Transformation EIS, the range areas are discussed in terms of North and South Ranges, with U.S. Highway 27/280 acting as the dividing line between the two sections.

2.2.1 Changes to BRAC 2005 and Transformation Actions EIS

Given the multi-year timeframe and magnitude of transition at Fort Benning, the planning process has been necessarily iterative for BRAC/Transformation Actions. As noted in the BRAC/Transformation EIS and Biological Assessment (BA), complete design information was not available for projects slated in FY09 and beyond (USACE 2007a, 2007c). Under Army procedures these projects are planned and programmed up to 3 years in advance. The projects are either design-bid-build projects, in which a design is finalized then contracting processes are followed to engage a construction contractor, or the projects are design-build, in which one contractor is engaged to not only design but then construct the project. Nothing can be designed or constructed until funding approval is received from Congress. For some BRAC/Transformation projects being revisited in this MCOE EIS, the design process has been underway, resulting in changes to an extent that some of them warrant another hard look at their potential environmental impacts.

The following is a general description of the type of projects that are evaluated in this EIS; Chapter 3 identifies the alternatives and has a detailed listing of each project, the Army-assigned project tracking numbers, and the years in which construction are planned to begin.

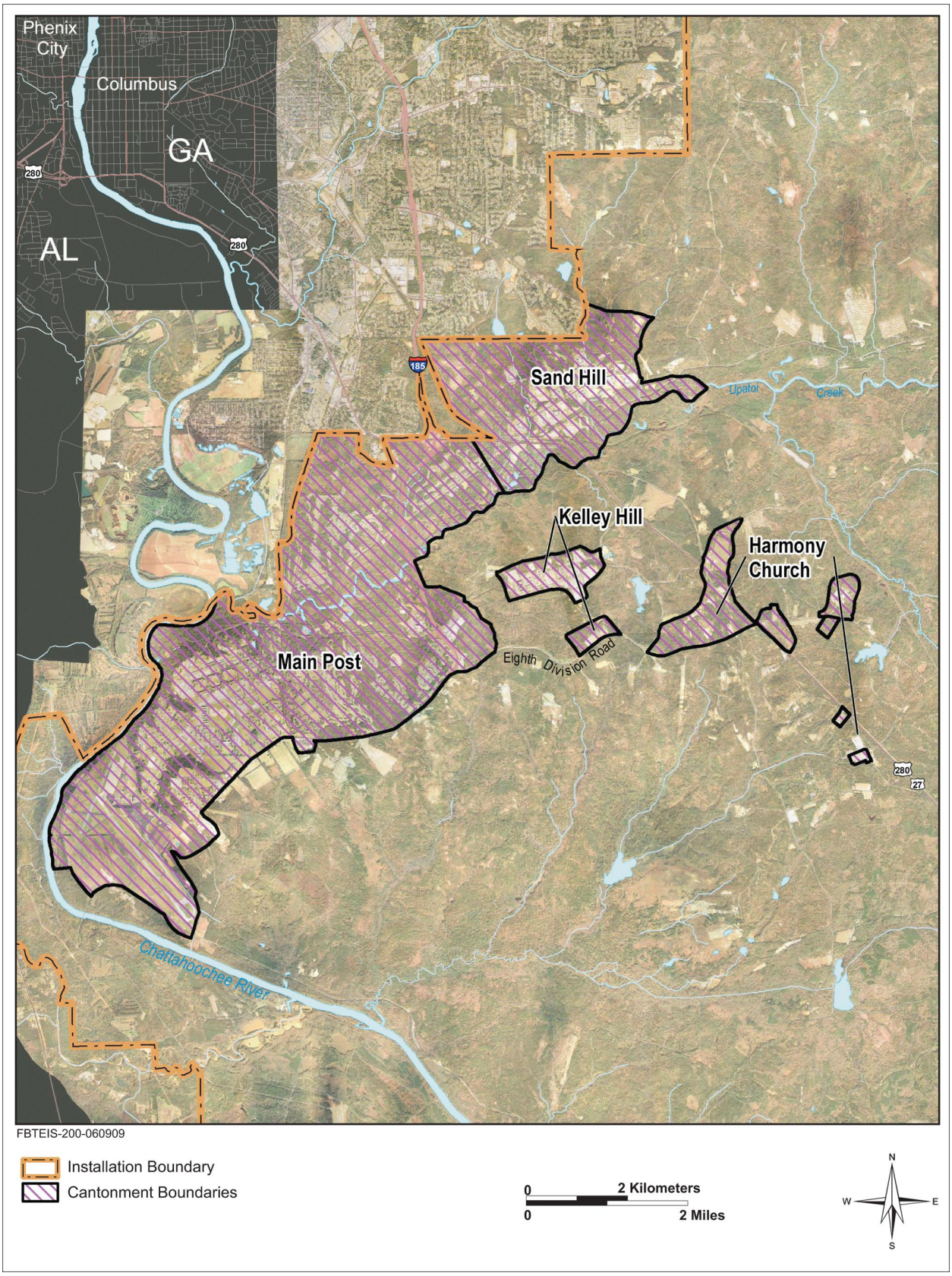


Figure 2.2-1: Fort Benning Cantonment Areas

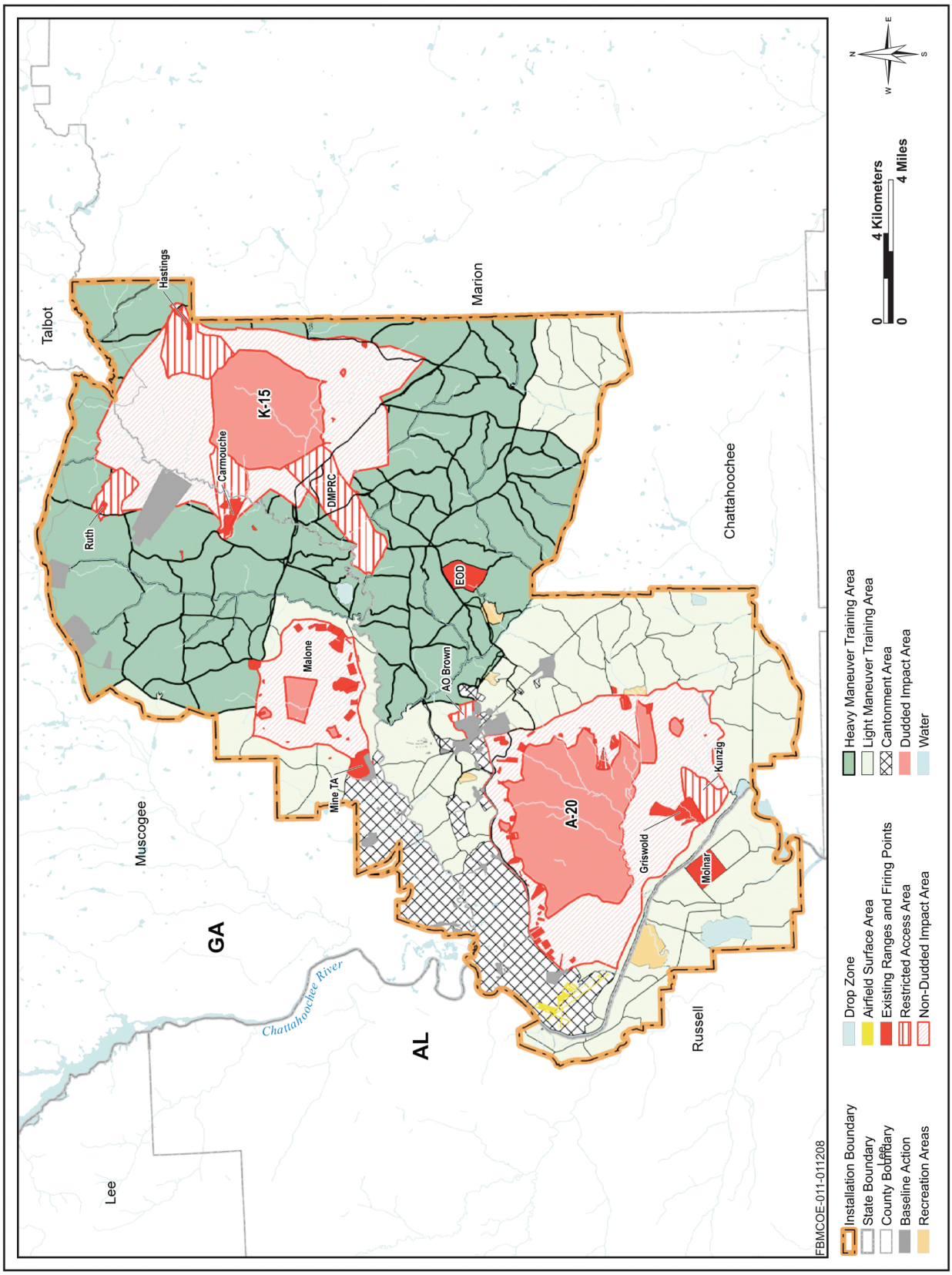


Figure 2.2-2: MCOE EIS Ranges and Maneuver Training Areas Baseline Conditions

Almost 20 projects originally identified in the BRAC/Transformation EIS have subsequently changed in location or grown in size. Most of the projects that have changed in location are found in the training areas (as opposed to cantonment area projects) and include ranges and Installation-wide training area road development.

Several projects have changed in size: the Vehicle Recovery Course, also referred to as the Ground Mobility Division (GMD) (north of U.S. Highway 27/280) has decreased in size for Alternative A, the Physical Fitness Center in Harmony Church has increased in size, and the hospital replacement on the Main Post has decreased under both action alternatives. Installation wide, several infrastructure projects are also proposed. In addition, a number of projects identified in the BRAC/Transformation EIS as reasonably foreseeable in the FY14 timeframe (and were, therefore, analyzed for cumulative effects but not part of the Proposed Action), have since been planned for construction earlier than FY14. Because they are now programmed, the probability of their being funded has increased and the Army felt that they needed to be re-evaluated for their potential impacts. These projects are predominantly in the training areas and include numerous ranges. Several facilities would also be established in the cantonment areas.

2.2.2 Army Growth

The objective of the nationwide Army Growth Campaign Plan is to permanently increase overall end strength by about 65,000 Active-Component Soldiers by 2013. Of this, a gain of 30,000 Soldiers was previously authorized by Congress as a temporary increase; in 2008 the Congress voted to keep these increases on a permanent basis. These Soldiers were accommodated in Army units across the U.S.; impacts associated with this "plus up" were evaluated following Army NEPA Regulations and the appropriate level of NEPA documentation was completed for the receiving units. At Fort Benning, this temporary increase included 45 permanent party military personnel, and 73 military personnel in the 14th Combat Support Hospital, 19th Optometry Detachment, and 497th Movement Control Team for a total temporary gain of 118 personnel. According to an Army Growth Stationing Announcement on January 8, 2008, the additional 35,000-Soldier increase is planned to occur across the Army at a rate of 7,000 Soldiers per year between 2008 and 2013 (U.S. Army 2008). Although the specific student training load and specific supporting cadre gains at Fort Benning were not included in this 2008 Announcement, the following assumptions were used to predict personnel increases (U.S. Army 2008):

- The proposed Grow the Army projects would support one additional Initial Entry Training battalion at Fort Benning. This would equate to 120 cadre members and the average daily training load would increase up to 1,200 Initial Entry Training Soldiers per day (five Companies with 240 Soldiers per Company).
- There would be additional increases in training loads for advanced Infantry and Armor training, as well as Officer Candidate and Airborne School since Fort Benning is the only location for these training opportunities; increases would also occur in the enrollment for Basic Officers Leaders Course, which is offered only at Fort Benning and Fort Sill, Oklahoma.

To accommodate this growth, numerous housing, dining, and classroom facilities are being proposed within the cantonment areas; only one range, the Multi-Purpose Machine Gun Range-1 (MPMG 1, PN68733), would be constructed to meet Growth needs.

2.2.3 Other Projects

There are several proposed projects that, due to implementing the BRAC/Transformation actions are now needed. These unforeseen projects were not included in the BRAC/Transformation EIS and include Warrior in Transition, maintenance, and shopping facilities; hospital and medical additions; water treatment plant upgrades and expansion; as well as training infrastructure projects for ranges and roads.

2.3 PROPOSED CANTONMENT, RANGE, AND TRAINING AREA REQUIREMENTS

2.3.1 Cantonment Area Development

The majority of cantonment area construction would be infill development in Main Post and new development in previously disturbed areas of Sand Hill. The Water Treatment Plant Upgrade and Expansion in the Main Post, approximately 260 acres, would include construction of a new inlet to draw water from the Chattahoochee River. The proposed projects in Sand Hill would together impact approximately 375 acres. The proposed hospital replacement project, approximately 137 acres, has the single largest impact footprint in the cantonment areas.

2.3.2 Range and Training Area Requirements

The proposed range and training area development is primarily driven by the ongoing implementation of the BRAC/Transformation projects; however, they are also related to Grow the Army, GDPR, and existing missions. The types of ranges proposed at Fort Benning include the following (USACE 2008):

- *Vehicle Recovery Course (or GMD) (PN72017)* – used to train Soldiers on how to retrieve tracked vehicles when mired and/or overturned. This includes operating towing equipment and learning towing techniques in various conditions including sandy and muddy areas. The additional equipment associated with this training was fully evaluated in the BRAC/Transformation EIS; however, the potential footprint of this training activity has decreased from that assessed in the BRAC/Transformation EIS.
- *Rifle/Machine Gun Zero Ranges (PNs 65035, 65036 and 65039)* – used to train individual Soldiers on the skills necessary to align the sights and practice basic marksmanship techniques against stationary targets. The range is designed for training Shot-Grouping and Zeroing exercises with the M16 and M4 series rifles as well as crew served machine guns.
- *Modified Record Fire Ranges (PNs 65043 and 65049)* – used to train and test individual Soldiers on the skills necessary to identify, engage, and defeat stationary infantry targets for day/night qualification requirements with the M16 and M4 rifles. The training intent of the Modified Record Fire Range is to meet the Army's requirement that every Soldier assigned a M16 or M4 rifle conduct semiannual qualification with their rifle.

- *Multi-Purpose Training Range (PN64551)* – used to train and test crews and dismounted infantry squads on the skills necessary to detect, identify, engage, and defeat stationary infantry and stationary and moving armor targets in a tactical array. In addition to live-fire, this complex can also be used for training with sub-caliber and/or laser training devices. The complex is specifically designed to satisfy the training and qualification requirements for crews and sections of armor, infantry, and aviation units. This complex also supports dismounted infantry squad tactical live-fire operations both with and without supporting vehicles.
- *Fire and Movement Ranges (PNs 65033 and 65034)* – used to train individual Soldier and buddy/teams on basic fire and movement techniques against stationary infantry targets. Soldiers show their ability to select covered and concealed positions, move while under fire, apply principles of teamwork, and use suppressive fire on enemy Soldier targets.
- *Anti-Armor Tracking and Live Fire Complex (PN65078)* – used to train and test Soldiers on the skills necessary to employ anti-armor missile systems, and identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. The complex is designed to satisfy the training and qualification requirements of medium and heavy anti-armor weapon systems. This type of range is also used for field tracking and qualification exercises.
- *Multi-Purpose Machine Gun Ranges (PNs 65070 and 68733)* – used to train and test Soldiers on the skills necessary to zero, detect, identify, engage and defeat stationary infantry targets, moving infantry targets, and stationary armor targets in a tactical array with the following weapons: M2 machine gun, Mk-19 40mm grenade, M60, M240B, M249 squad automatic weapon, M249 automatic rifle, and M24 7.62mm sniper rifle.
- *Range Roads* – under the Proposed Action, new training roads would be constructed and existing training area roads and/or tank trails repaired or upgraded. After construction, the average operational width of the road would be approximately 30 ft, including the berms to support the variety of wheeled and tracked vehicles used for training.
- *Water Crossings* – crossings would be established along proposed range roads and trails where stream crossing cannot be avoided. Currently, Fort Benning uses two designs for water crossings: one is a hardened low-water crossing where the vehicle drives down a hardened slope, goes into the stream, and then proceeds out the other side. The second type of water crossing is a hardened 30-foot wide roadway over an arched culvert that allows unimpeded stream flow (personal communication, Sweeney 2008). A culvert crossing is the preferred crossing to minimize erosion.

2.4 ARMY DECISIONMAKING PROCESS AND DECISION TO BE MADE

The Army's decisionmaker will consider all relevant environmental information and public issues of concern disclosed in this EIS. In addition, he/she will take into consideration several non-environmental factors critical to the final decision such as Army directives; existing and emerging national defense needs as identified in Chapter 1; Soldier and their Family quality of life; Fort Benning mission requirements; and cost efficiencies. Then after a thorough evaluation of this information, the decisionmaker will document the decision and announce selection of one of the alternatives in the ROD. This document will be signed no earlier than 30 days from publication of the final EIS Notice of Availability (NOA) in the *Federal Register*. The ROD clearly and definitively articulates the decision made and provides supporting explanations. Once the ROD is finalized, the Army will forward a NOA to the *Federal Register* and make the ROD available for public review.

For this proposal, the decision to be made includes:

- Whether or not the action alternatives adequately meet the purpose and need of the Proposed Action.
- Conclude whether the alternative for construction, operations, and maintenance activities associated with the BRAC/Transformation Actions, Grow the Army, and MCOE initiatives is adopted, and if not, for what reasons.
- Concurrence with the findings presented in the EIS.
- Identify mitigation measures the Army will adopt and fund in order to minimize adverse impacts.

CHAPTER 3

ALTERNATIVES

3.0 ALTERNATIVES

3.1 INTRODUCTION

Alternatives form the core of the NEPA process. In compliance with Army NEPA and CEQ regulations, the Army must consider reasonable alternatives to the Proposed Action. Only those alternatives determined as reasonable relative to their ability to fulfill the purpose and need for the Proposed Action warrant detailed analysis. To be considered reasonable, an alternative must not only fulfill the purpose and need for the action, it must also be technically and fiscally feasible. Through a rigorous evaluation, the Army examined a range of alternatives, determined which were reasonable, and identified those not carried forward for detailed analysis.

In conformance with these requirements, the Army explored potential alternatives. Options considered in this examination included alternative locations for facilities, activities, and ranges; modifying the number of students being trained at Fort Benning as a result of Army Growth; and different phasing of implementation. As discussed below, few of these options proved reasonable relative to the purpose and need.

Described below are the various alternatives considered to implement this action. Included are the screening criteria, alternatives considered but not carried forward, the action alternatives, the No Action Alternative, and the baseline conditions. The No Action Alternative incorporates FY09-FY13 projects that were analyzed in the BRAC/Transformation EIS (USACE 2007a). Inclusion of these projects is necessary because the Army announced its decision to construct these BRAC/Transformation facilities in the ROD and they will be built regardless of this Proposed Action (USACE 2007b). If any of these No Action Alternative projects are relocated or substantially change in size from what is presented here, the appropriate level of NEPA documentation and agency consultation will be completed by Fort Benning before any construction is undertaken. In this EIS, impacts for all alternatives (including No Action) are also compared against the baseline conditions; this approach provides a clear basis from which to choose.

Baseline conditions, against which impacts of the alternatives are compared, include the existing environment found as of March 2008 when this proposal was announced in the *Federal Register* (see Appendix A). As such, it includes the FY07 and FY08 projects identified in the BRAC/Transformation final EIS along with the baseline conditions used in the EIS (USACE 2007a). If a comparison is done of projects proposed for construction in the FY07 BRAC/Transformation EIS, readers will notice that some were delayed and not built until FY08. Table 3.1-1 presents an updated version of construction schedule of BRAC/Transformation projects in FY08. Figure 3.1-1 illustrates baseline conditions, including these projects.

Table 3.1-1: BRAC/Transformation FY07and FY08 Projects included in Baseline Conditions

PN	Project Title
46676	Child Development Center (Indianhead)
54931	Child Development Center, Ages 6-10
62956	Health Clinic-Winder, Sand Hill
64080	Troop Medical/Dental Clinic
64368	Soloman Dental Clinic, Sand Hill
64370	Trainee Barracks Complex 1
64459	Training Support Brigade Complex, Phase 1
64462	Reception Station, Phase 1
65032	Fire & Movement Range 1 (FM 1)
65041	Trainee Barracks Complex 3
65044	Modified Record Fire with Location of Hit and Miss System 2 (MRF 2)
65045	Modified Record Fire 3 (MRF 3)
65046	Modified Record Fire 4 (MRF 4)
65048	Modified Record Fire 6 (MRF 6)
65056	Brigade Headquarters Complex
65068	Trainee Barracks Complex 2, Sand Hill
65251	Vehicle Maintenance Facility
65253	16th Cavalry General Instruction Complex 1
65285	Maintenance & Repair Of Maneuver Center
65287	Training Support Center
65382	Tank F/V Stationary Gunnery Range (ST 1)
65394	Special Operations Forces Battalion Complex
65396	Special Operations Forces Headquarters Building Addition
65397	Special Operations Forces Tactical Equipment Shop
65439	Fire Station
	Anti-Terrorism/Force Protection Access Control
	Marne Road/Lindsay Creek Parkway Intersection
65862	Training Support Brigade Complex, Phase 2
67648	Simulations Training Facility
70138	135-Capacity Child Development Center

Resource-specific baseline conditions and environmental consequences are provided in Section 4, along with a contextual discussion of these resources as they relate to baseline conditions and activities identified in the BRAC/Transformation EIS.

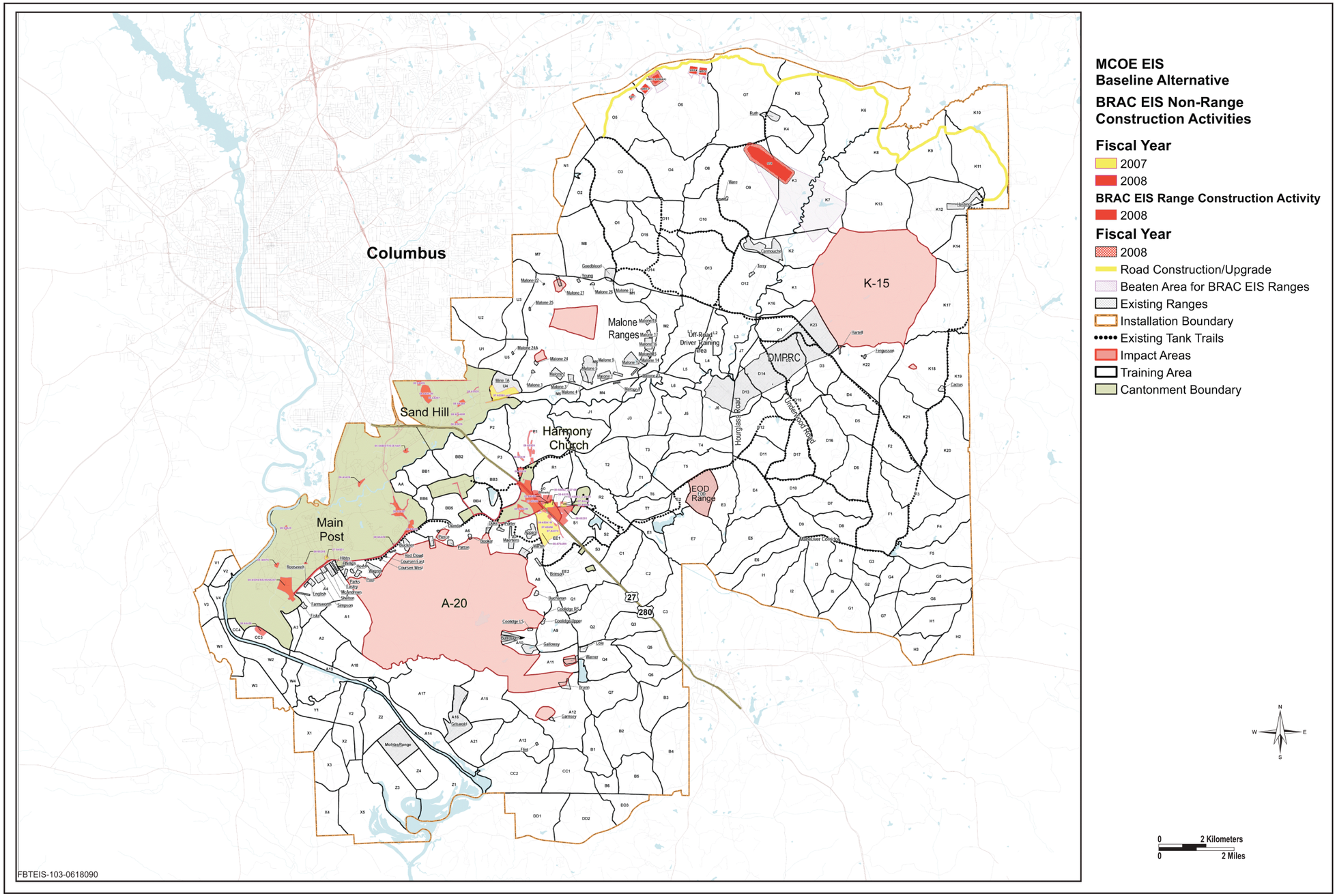


Figure 3.1-1: MCOE EIS Ranges and Maneuver Training Areas Baseline Conditions

This page intentionally left blank.

3.2 ALTERNATIVES CONSIDERED BUT NOT ADDRESSED IN DETAIL

The Army identified three alternative options for the Proposed Action; these included relocating facilities and activities, phasing and scheduling of implementation, and training students at other Army installations.

3.2.1 Alternative Locations and Activities

One set of the alternatives considered focused on alternative sitings for facilities and activities proposed to fulfill the project need. While AR 210-20, *Master Planning for Army Installations* (U.S. Army 2005a) establishes Army policy to maximize use of existing facilities, the planning effort associated with this Proposed Action determined that there were insufficient facilities to meet all of the needs identified to support the BRAC/Transformation, MCOE, and Growth actions at Fort Benning. Similarly, use of off-Post rented/leased facilities was evaluated, but rejected because it would 1) require additional security measures than what are already available on-Post, 2) be more costly than staying on-Post, and 3) be untenable given the number and nature of facilities needed. For example, barracks ideally should be located near similar housing functions and operational and equipment/vehicle maintenance functions should be easily accessible to Soldiers and training areas. For these reasons, alternatives that propose locating facilities or functions off-Post were not considered reasonable and were not analyzed further. However, the Army determined during consultation with the USFWS that by moving the Scout Leader Course (under Alternative A) to an off-Post location could be feasible as a means to minimize adverse impacts to the Red-cockaded Woodpecker. The movement of the Scout Leaders Course would be subject to future NEPA documentation as alternatives are developed. This consultation process is further described in Section 4.13.2.2 and Appendix F. In terms of alternative locations for proposed range and maneuvering activities, Fort Benning considered the possibility of relocating existing dismounted training to off-Post locations, either other federal lands or non-federal lands, creating more room for mounted, heavy maneuver training. This option was not deemed viable due to a lack of suitable locations, availability, and funding.

3.2.2 Implementation Phasing Alternative

Another alternative considered was a different phasing of implementation. Factors influencing the implementation schedule include minimal disruption of on-going mission activities, alignment with construction time frames, arrival dates of increased student numbers, stand-up dates of BRAC and Transformation activities, and the schedule for Army Growth (FY08 through FY13). Earlier implementation is not fiscally possible due to Army and congressional budget processes and delay is not feasible because the projects are necessary to meet the screening criteria during the same time frame as the BRAC/Transformation, MCOE standup, and Army Growth activities. Alternative implementation schedules, other than those presented here, would not meet the purpose and need of the Proposed Action and were not carried further for analysis.

3.2.3 Training Students at other Army Installations Alternative

Yet another alternative considered was to create training sites for increased student numbers at other Army installations. This alternative was not considered to be feasible because all advanced Infantry training is currently located at Fort Benning; creating a new advanced training site would mean new facility and training area construction, increased funding needs, and potential delay in supporting the increased student numbers. Similarly, by 2011 all advanced Armor training will occur at Fort Benning and any new advanced Armor training site would incur similar "costs" that were identified for Infantry training. The Officers Candidate and Airborne Schools are also only found at Fort Benning and to support the additional student load at another Army installation would require establishing the specific training assets needed to support these schools. It is for these reasons that this alternative was not carried forward for further analysis. As noted above, the draft Jeopardy Opinion issued to the Army resulted in the development of an RPA that included the possibility of relocating training, specifically the Scout Leaders Course (Army Reconnaissance Course), to other Army Installations. The Army is in the process of reviewing the options for this training relocation.

3.3 ALTERNATIVES CARRIED FORWARD

Criteria used in screening potential alternatives from further consideration are presented in Table 3.3-1. Only alternatives that would meet these criteria were carried forward for further analysis. Four major factors were applied for screening purposes as shown on Table 3.3-1:

Table 3.3-1: MCOE Screening Criteria

Factor 1. Meet BRAC/Transformation Actions, MCOE, and Growth Purpose and Need:
• Provide the facilities and training assets to support BRAC/Transformation projects that have been relocated, have been funded and brought forward for construction, are newly planned, and/or have been programmed • Provide the facilities and training assets to implement projects under the BRAC/Transformation EIS that have substantially changed in size and warrant another hard look • Provide the facilities and training assets to implement MCOE and Army Growth *Note*: each of these criteria are identified in the description of purpose and need (Section 1.2)
Factor 2. Meet Range and Training Operational Needs:
• Result in no net loss in existing training ranges and maneuver area capabilities • Meet Army training and safety requirements • Use existing live-fire ordnance impact areas
Factor 3. Land Use Compatibility:
• Protect the safety of the public and Fort Benning military and civilian personnel and dependents • Prioritize optimal alternative siting so as not to conflict with Fort Benning's existing missions (per AR 210-20, U.S. Army 2005a)
Factor 4. Sustainability:
• Provide for a sustained natural environment that allows Fort Benning to train and maintain its military missions and readiness in accordance with The Army Strategy for the Environment (U.S. Army 2004b)

Fort Benning used a thorough application of environmental and operational constraints to choose potential alternatives sites for the Proposed Action. The Army's overriding priority for site identification was to ensure the safety of military and civilian populations. The proposed sites were also selected as part of the Installation's goal to minimize interference with its military mission, and its need to address compatibility issues with adjacent land uses, missions, and functions. In siting the proposed training assets, the Army wanted to ensure that performing these activities would be compatible with existing and

planned mission requirements as well as sustain the natural environment. For example, live-fire ranges should be co-located with existing impact areas because no new impact areas may be created without approval by the Assistant Secretary of the Army per Army regulation AR 385-63 (U.S. Army 2003); ranges also could not be sited in a manner that would constrain or conflict with use of existing or planned ranges nor with their associated surface danger zones. After this screening application, Fort Benning identified two action alternatives—Alternatives A and B.

3.4 ALTERNATIVES CONSIDERED

The Army has identified Alternative A as their preferred alternative because it best meets the purpose and need of the Proposed Action. Alternative B would also meet the purpose and need, but, it is not the preferred option because it would involve substantially greater adverse environmental and mission impacts than Alternative A. The maneuver training for Alternative B would require more travel time between the motorpools and the training areas for heavy tracked and wheeled vehicles and this training area would not be located adjacent to the majority of operational facilities. For Alternative B, the 19D/K One Station Unit Training (OSUT) area south of U.S. Highway 27/280 would present constraints to meeting Armor School OSUT training requirements. Alternative B would also result in substantially greater impacts to protected species and other environmental resources.

3.4.1 Alternative A (preferred alternative) and Alternative B Cantonment and Training Area Development

Cantonment and training area development for Alternative A is presented in Table 3.4-1. The projects included in each alternative are grouped by project location; designated project numbers (PN), construction start date, the project name, and disturbance-area footprint. The total acreage of disturbances associated with Alternative A is substantially smaller since the Draft EIS was made available to the public in December 2008 due to project re-design and scoping revisions primarily prompted by consultation with the USFWS. These project changes included the deletion of the Multi-Purpose Machine Gun Range 2 (PN 65070); move of the Multi-Purpose Training Range as an upgrade to Hastings Range; major reductions in the footprint of the Vehicle Recovery Course (PN 72017); major reductions in the training and impacts from the 19 D/K OSUT Area Infrastructure (PN 69741); major reductions in impacts due to training reductions in the Southern Training Area Infrastructure (PN 69743); reductions to the limits of construction and beaten area for the Stationary Tank Range 2 (PN 65383); and reduced impacts from changes associated with the Modified Record Fire Range 7 (PN 65049) and the Firing Range 2 (PN65036). In addition, under Alternative A the Scout Leaders Course field training would be relocated within 5 years of its initiation to a location off Fort Benning, yet to be identified.

Table 3.4-1: MCOE EIS Alternative A (preferred alternative) Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	
		Installation Wide	**Disturbance-Area Footprint (Acres)**
65554	09	Construct Training Area Roads Paved	715
67457	09	Infrastructure Support, Increment 2 (Includes Security Fence and Dixie Road Expansion from Michaels Street to Sightseeing Road)	246
65557	10	Repair Existing Training Area Roads, Phase 1	352
		Cantonment Area—Harmony Church	
71065	09	Troop Store – Army and Air Force Exchange Service (AAFES) (Non-Appropriated Funds [NAF])	6
64460	09	Direct Support/General Support Vehicle Maintenance Facility	36
65322	09	Shop 1 Maintenance Facility	10
65246	12	Recreation Centers in Harmony Church and Sand Hill	28
65248	12	Physical Fitness Center, Harmony Church	39
62953	12	Rail Loading Facility Expansion	134
		Cantonment Area—Main Post	
70235	09	Hospital Replacement	137
69999	09	Warrior in Transition Complex	46
71473	10	Water Treatment Plant Upgrade and Expansion	47
69151	10	Dining Facility to Support Advanced Skill Training (AST)	10
65250	10	Maneuver Battle Lab	27
71620	10	Dental Clinic Addition (Bernheim Site)	10
		Cantonment Area—Sand Hill	
69147	09	Trainee Complex Upgrade	81
70027	10	Classrooms with Battalion Dining Facilities	72
64481	10	Blood Donor Center	12
70026	10	Classrooms with Battalion Dining Facilities	50
72322	10	Training Barracks Complex, Phase 1	131
69150	10	Classrooms & Dual Battalion Dining Facilities	66
72324	11	Training Barracks Complex, Phase 2	Note 1
72456	11	Training Dining and Classroom Facilities, Phase 2	Note 2
72457	11	Training Dining and Classroom Facilities, Phase 2	Note 3
69745	12	Training Barracks Complex, Phase 3	Note 1
65249	13	Chapel	0 (already disturbed)
		Ranges North of U.S. Highway 27/280	
72017	09	Vehicle Recovery Course (GMD)	192
65035	09	Basic 10M – 25M Firing Range 1 (Z 1)	23
65039	09	Basic 10M – 25M Firing Range 5 (Z 5)	22

Table 3.4-1: MCOE EIS Alternative A (preferred alternative) Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	
Ranges North of U.S. Highway 27/280 (cont.)			
65036	09	Basic 10M – 25M Firing Range 2 (Z 2)	9
65049	09	Modified Record Fire 7 (MRF 7) – 5.56mm: M855 Ball	38
65043	09	Modified Record Fire 1(MRF 1) – 5.56mm: M855 Ball	59
64551	09	Multi-Purpose Training Range 1 (MPTR 1) – 25mm, 120mm, 7.62mm, 5.56mm & .50 Caliber (Cal)	Note 4
65033	09	Fire and Movement Range 2 (FM 2) – 5.56mm: M855 Ball	89
69741	09	19D/K OSUT (Heavy Mounted/Dismounted Training in TA- L1, O12-14, and portions of O15 and Heavy Mounted Training in TA-O14, O15, and L1-5)	271
69742	09	Northern Training Area Infrastructure (Heavy Mounted Training in TA-O1,O3,O11,O14, and O15)	260
69743	09	Southern Training Maneuver Area Infrastructure	2,936
65034	10	Fire and Movement Range 3 (FM 3) – 5.56mm: M855 Ball	44
65383	09	Stationary Tank Range 2 (ST 2)	279
64797	09	Drivers Training Course (Access Roads)	18
Ranges South of U.S. Highway 27/280			
65078	09	Anti-Armor Tracking And Live Fire Complex 1	57
69358	09	Range Access Road – Good Hope Maneuver Training Area	162
69668	09	Good Hope Training Area Infrastructure	4,112

Note 1: *Both PN 72324 and PN 69745 occur at the same location as PN 72322*
Note 2: PN 72456 occurs at the same location as PN 70026
Note 3: PN 72457 occurs at the same location as PN 70027
Note 4: *The MPTR is being constructed as an upgrade to the Hastings Range so no additional acreage impacts will occur.*

3.4.2 Alternative B Proposed Cantonment and Training Area Development

The relative difference is readily discernable recognizing that the total amount of land disturbance associated with Alternative B is 24,596 acres while Alternative A is 10,045 acres. Alternative B differs from Alternative A in a number of areas, all of which result in differences in the amount of land disturbance and associated impacts to a wide range of environmental resources especially biological resources, water resources, and soils. In addition to the differences noted above, Alternative B has the following project differences as well:

1. 19D/K OSUT would take place in TA-Q1, Q2, Q3, and Q5 (training areas south of U.S. Highway 27/280 and illustrated in Figure 3.4-3).
2. TA-L1, L2, and L3 would be used for existing maneuver training.
3. The Multi-Purpose Machine Gun Ranges 1 and 2 are included in Alternative B only.
4. The Unit Maintenance Facilities is included in Alternative B only.
5. The Automated Combat Pistol Qualification course is also only included in Alternative B.
6. The MPTR (PN 64551) would be sited north of Hastings Range rather than within the existing Hastings Range footprint.

Figures 3.4-1 and 3.4-2 present cantonment-area development for Alternatives A and B, respectively; training area and range proposed projects are illustrated in Figure 3.4-3 for Alternative A and Figure 3.4-4 for proposed Alternative B.

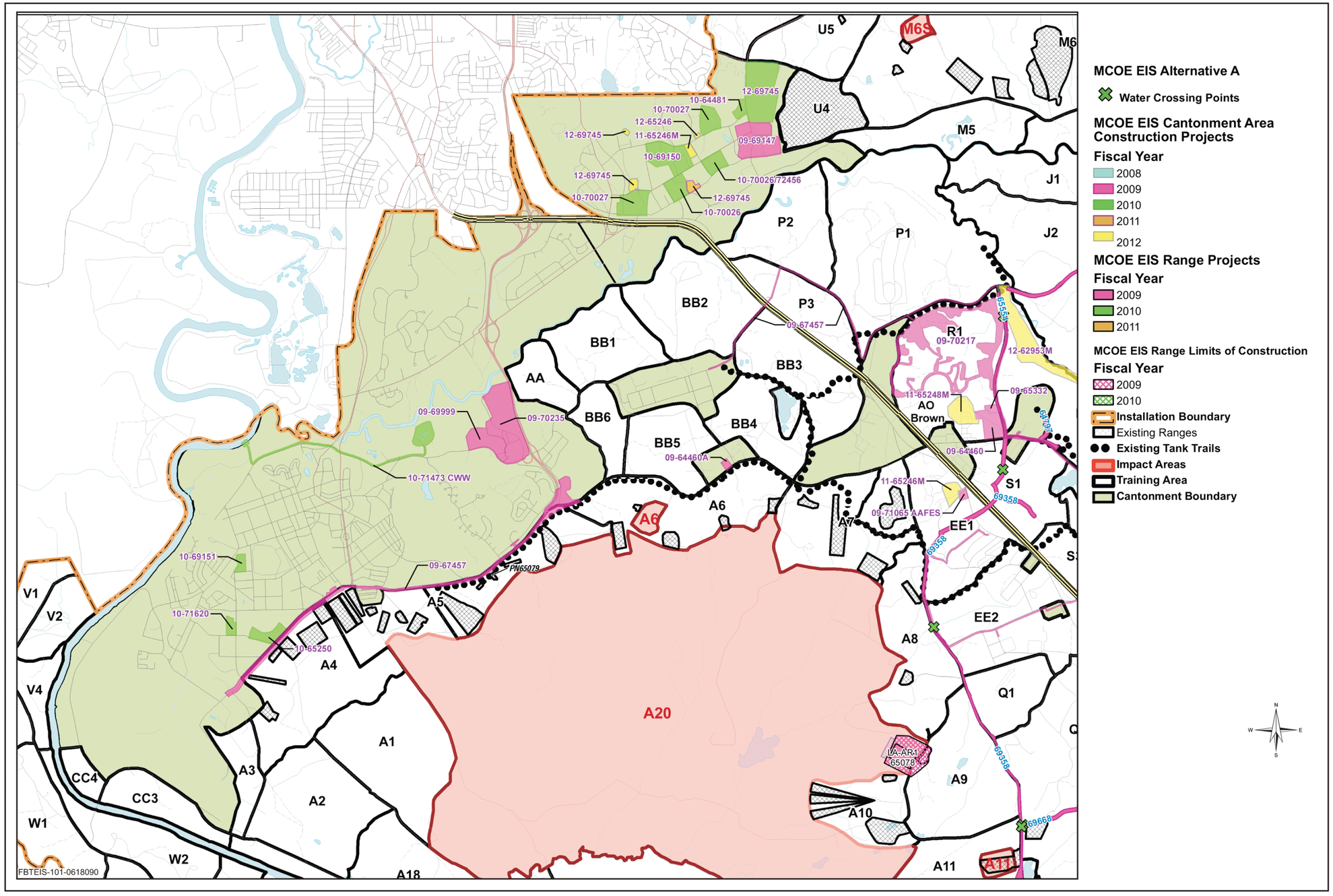


Figure 3.4-1: MCOE EIS Alternative A Proposed Cantonment-Area Construction

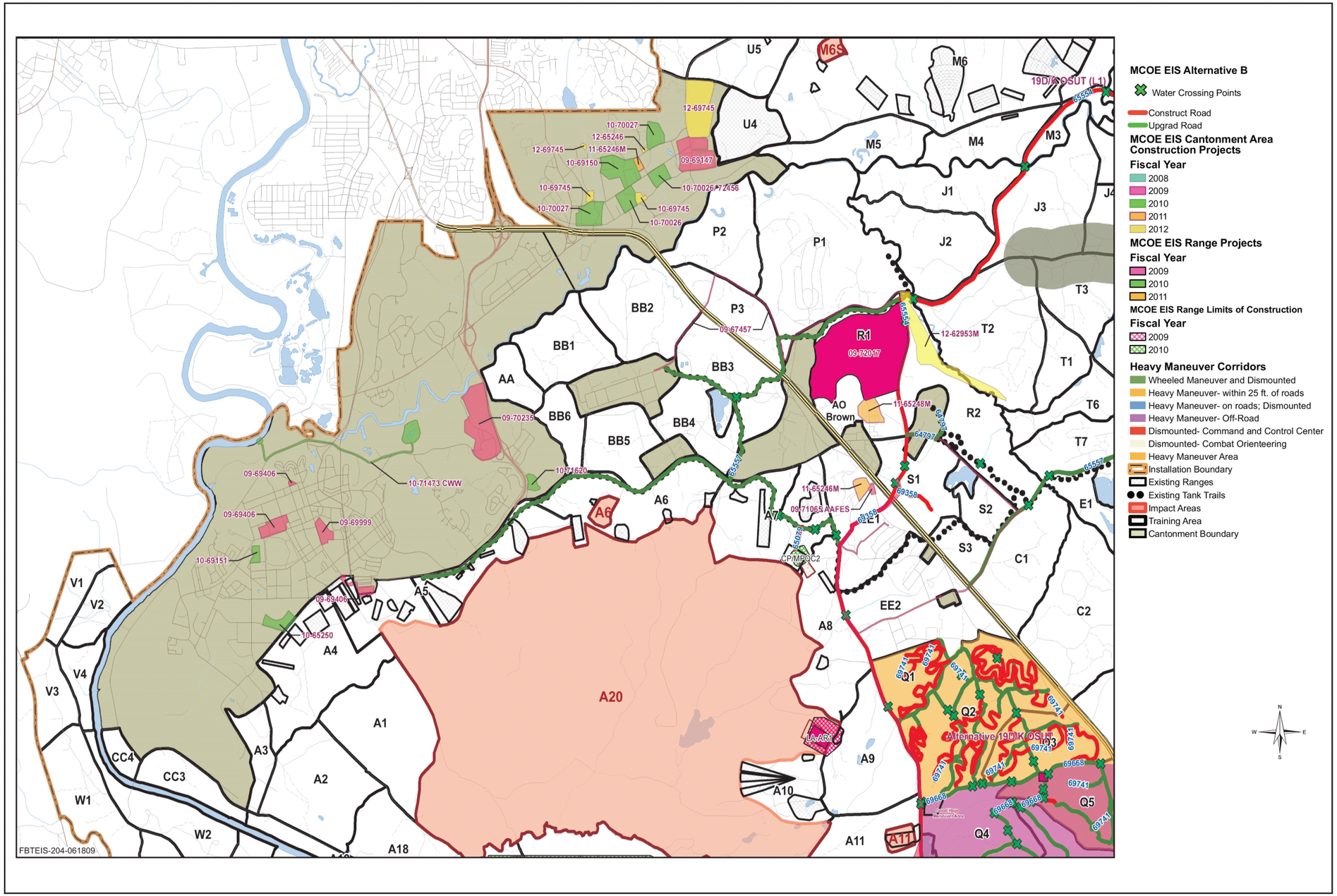


Figure 3.4-2: MCOE EIS Alternative B Proposed Cantonment-Area Construction

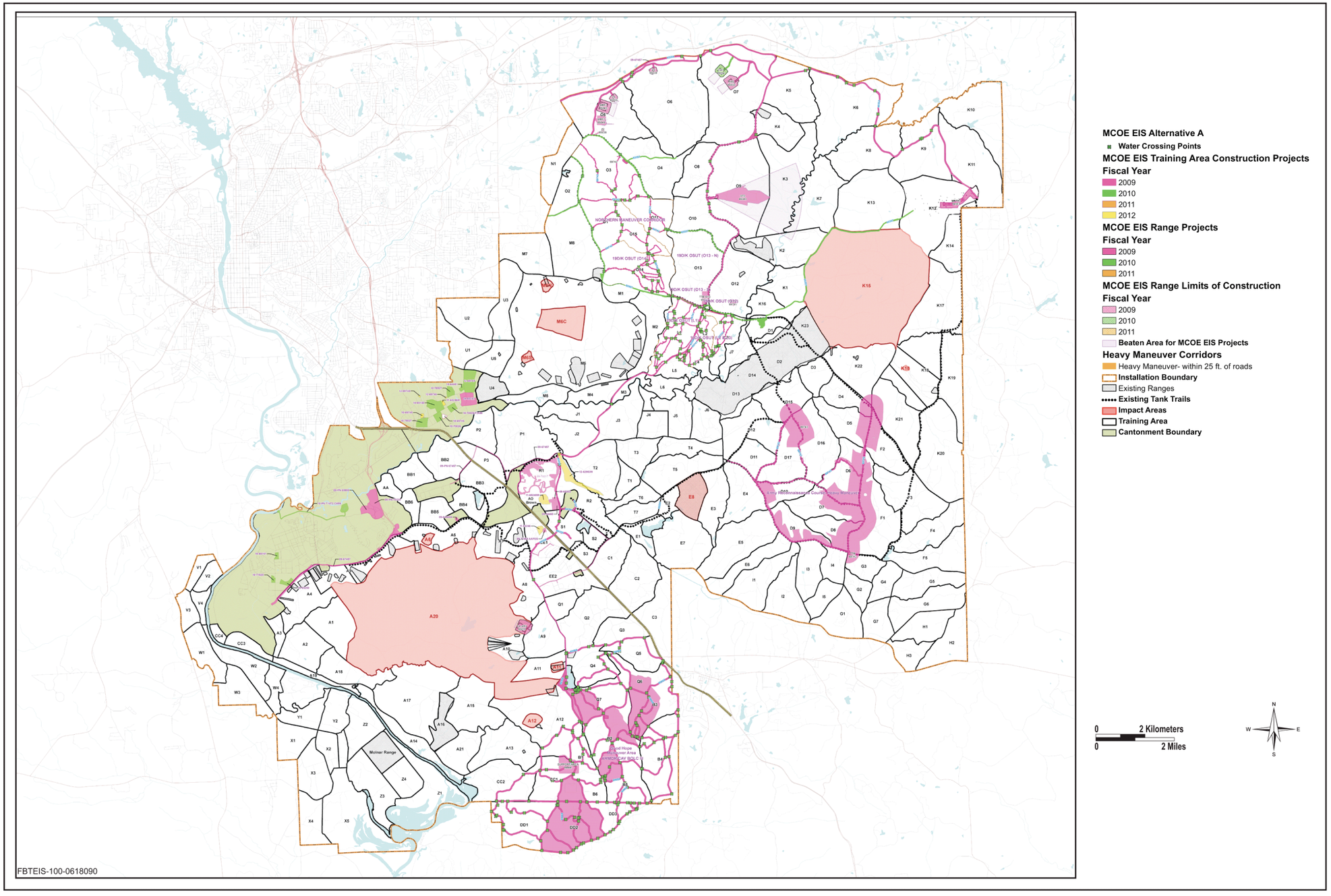


Figure 3.4-3: MCOE EIS Alternative A Proposed Ranges and Maneuver Training Area Construction

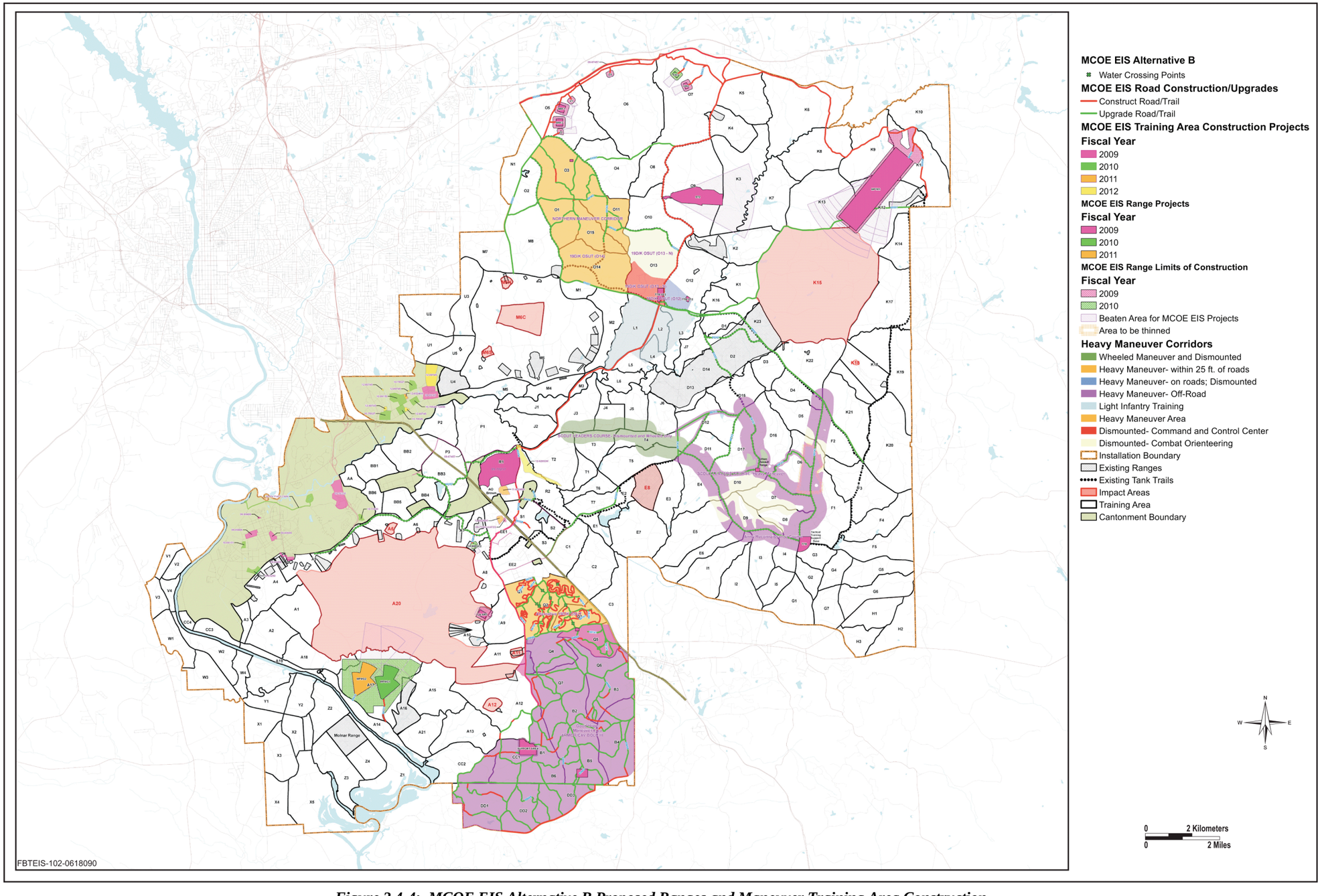


Figure 3.4-4: MCOE EIS Alternative B Proposed Ranges and Maneuver Training Area Construction

Table 3.4-2: MCOE EIS Alternative B Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	
Installation Wide			**Disturbance-Area Footprint (Acres)**
65554	09	Construct Training Area Roads Paved	905
67457	09	Infrastructure Support, Increment 2 (security fence, and Dixie Road Expansion from Michaels Street to Sightseeing Road)	(site already disturbed)
65557	10	Repair Existing Training Area Roads, Phase 1	991
Cantonment Area—Harmony Church			
71065	09	Troop Store - AAFES (NAF)	4
65039	09	Basic 10M-25M Firing Range 5 (Z 5)	1
64460	09	Direct Support/General Support Vehicle Maintenance Facility	36
65322	09	Shop 1 Maintenance Facility	10
65246	12	Recreation Centers in Harmony Church and Sand Hill	27
65248	12	Physical Fitness Center, Harmony Church	39
62953	12	Rail Loading Facility Expansion	134
Cantonment Area—Main Post			
70235	09	Hospital Replacement	137
69406	09	Unit Maintenance Facility	1
69999	09	Warrior in Transition Complex	17
71473	10	Water Treatment Plant Upgrade and Expansion	47
69151	10	Dining Facility to Support AST Training	10
65250	10	Maneuver Battle Lab	27
71620	10	Dental Clinic Addition (Bernheim Site)	(site already disturbed)
Cantonment Area—Sand Hill			
69147	09	Trainee Complex Upgrade	65
64481	10	Blood Donor Center	12
70027	10	Classrooms With Battalion Dining Facilities	72
70026	10	Classrooms With Battalion Dining Facilities	50
72322	10	Training Barracks Complex, Phase 1	155
69150	10	Classrooms & Dual Battalion Dining Facilities	58
72324	11	Training Barracks Complex, Phase 2	Note 1
72456	11	Training Dining and Classroom Facilities, Phase 2	72
72457	11	Training Dining and Classroom Facilities, Phase 2	50
69745	12	Training Barracks Complex, Phase 3	131
65249	13	Chapel	(site already disturbed)

Table 3.4-2: MCOE EIS Alternative B Proposed Projects

PN	Project Date (FY)	Project Name/Location/Size	
Ranges North of U.S. Highway 27/280			
72017	09	Vehicle Recovery Course (GMD)	507
65035	09	Basic 10M – 25M Firing Range 1 (Z 1)	1
65039	09	Basic 10M – 25M Firing Range 5 (Z 5)	1
65036	09	Basic 10M – 25M Firing Range 2 (Z 2)	1
65049	09	Modified Record Fire 7 (MRF 7)– 5.56mm: M855 Ball	24
65043	09	Modified Record Fire 1 (MRF 1)– 5.56mm: M855 Ball	24
64551	09	Multi-Purpose Training Range 1 – 25mm, 120mm, 7.62mm, 5.56mm & .50 Caliber (Cal)	984
65033	09	Fire and Movement 2 (FM 2) – 5.56mm: M855 Ball	10
69742	09	Northern Training Area used for existing maneuver training. No new infrastructure constructed in TA-L1, L2, and L3	Note 2
65383	09	Stationary Tank Range (ST 2)	676
64797	09	Drivers Training Course (Access Roads)	34
65034	10	Fire and Movement 3 (FM 3) – 5.56mm: M855 Ball	10
Ranges South of U.S. Highway 27/280			
65078	09	Anti-Armor Tracking and Live Fire Complex	13
69358	09	Range Access Road – Good Hope Maneuver Training Area	166
69668	09	Good Hope Training Area Infrastructure	1,677
69741	09	19D/K OSUT (Heavy Mounted/Dismounted training in TA-Q1, TA-Q2, Q3, and Q5)	872
69743	09	Southern Training Area Infrastructure	583
68733	10	Multi-Purpose Machine Gun 1-7.62mm & .50 Cal	238
65079	10	Automated Combat Pistol Qualification Course	1
65070	11	Multi-Purpose Machine Gun 2 – 7.62mm & .50 Cal	238

Note 1: Both PN 72322 and 72324 are on the same 155-acre site.
Note 2: The Northern Training Area Infrastructure was analyzed in the BRAC/Transformation EIS (USACE 2007a).

3.4.3 No Action Alternative

According to CEQ NEPA implementing regulations, a clear basis for choice among options must be included and analyzed (40 CFR 1502.14[d]). Because the BRAC/Transformation actions were previously approved, regardless of the decision taken under this Proposed Action, they must be included in the No Action Alternative. The No Action Alternative, therefore, includes conditions found under baseline and the FY09 through FY13 BRAC/Transformation projects and the conditions found under baseline. This EIS offers an opportunity for decisionmakers and the public to evaluate impacts, by comparing impacts due to all alternatives with baseline. Table 3.4-3 provides a summary of the projects considered as part of the No Action Alternative and Figures 3.4-5 and 3.4-6 illustrate the alternative for the cantonment and training areas, respectively; please note to keep the figures less confusing just the No Action projects are

depicted. Refer to figure 3.1-1 for conditions under baseline. Items noted with an asterisk are projects that have been changed either in physical location or in timing of implementation since the BRAC/Transformation ROD and are now evaluated under the Proposed Action.

Table 3.4-3: MCOE EIS No Action Alternative Projects

FY	PN	Project Title
09	48644	Central Wash Facility
09	51256	Reception Barracks, Phase 2
09	64460	DS/GS Vehicle Maintenance Facility
09	64797	Tracked Vehicle Drivers Course
09	72017	Vehicle Recovery Training Area *
09	65035	Rifle/Machinegun Zero Range 1 (Z 1)*
09	65036	Rifle/Machinegun Zero Range 2 (Z 2)*
09	65037	Rifle Machinegun Zero Range 3 (Z 3)
09	65038	Rifle Machinegun Zero Range 4 (Z 4)
09	65039	Rifle/Machinegun Zero Range 5 (Z 5)*
09	65047	Modified Record Fire 5 (MRF 5)
09	65080	Consolidated Troop Medical Clinic
09	65081	Medical Treatment Facility, Increment 1*
09	65286	Armor Officer Basic Course Headquarters
09	65322	General Instruction Building Complex, Phase 1
09		Convert Non Unaccompanied Personnel Housing/Billeting Space to Transient
09		Infantry Basic Officers Course Headquarters Complex Building
09		Student Dining Facility Main Post
09	65383	Stationary Tank Range 2 (ST 2)*
09	65438	Vehicle Maintenance Instruction Facility
09	65578	Criminal Investigation Command Group (CIDC)/Brigade Headquarters Building
09	67419	Reception Station, Phase 3
09	67457	Infrastructure Support, Increment 2*
09	69358	Range Access Road—Good Hope Maneuver Training Area *
09	69668	Good Hope Training Area Infrastructure*
09	69742	Northern Training Area Infrastructure*
09	69743	Southern Training Area Infrastructure*
09	65554	Construct Training Area Roads Paved*
09	69741	Training Area Infrastructure – 19D/K OSUT*
09	65034	Fire and Movement Range 3 (FM 3)*
10	62207	Combined Arms Collective Training Facility, Phase 2
10	64491	Army Reserve Center/Operations and Maintenance Services/ Unheated Storage
10	65061	Armor Climate Control Storage Facility
10	65079	Automated Combat Pistol/Military Police Qualification Course*
10	65284	MCOE Headquarters Expansion/Capabilities Development and Integration (CDI)
10	65405	Equipment Concentration Site
10	65557	Repair Existing Training Area Roads*
10	67458	General Instruction Building Complex (Increment 2)
10	67461	Hospital Replacement (Increment 2)*
11	38134	Barracks Complex Main Post
11	63799	3rd Infantry Division (ID) Brigade Combat Team (Heavy) Complex

Table 3.4-3: MCOE EIS No Action Alternative Projects

FY	PN	Project Title
11	65395	SOF Ranger Support Company
11	67012	Qualification Training Range
12	65246	Community Activity Center*
12	65248	Physical Fitness Center*
12	62953	Rail Loading Facility Expansion*
12	64790	Battle Command Training Center
13	62952	Brigade Complex Headquarters, 14th Combat Support Hospital
13	65065	Chapel Harmony Church
13	65249	Chapel Sand Hill

Note: Items noted with an asterisk (*) are projects that have been changed since the BRAC/Transformation ROD and are now evaluated under Alternative A.

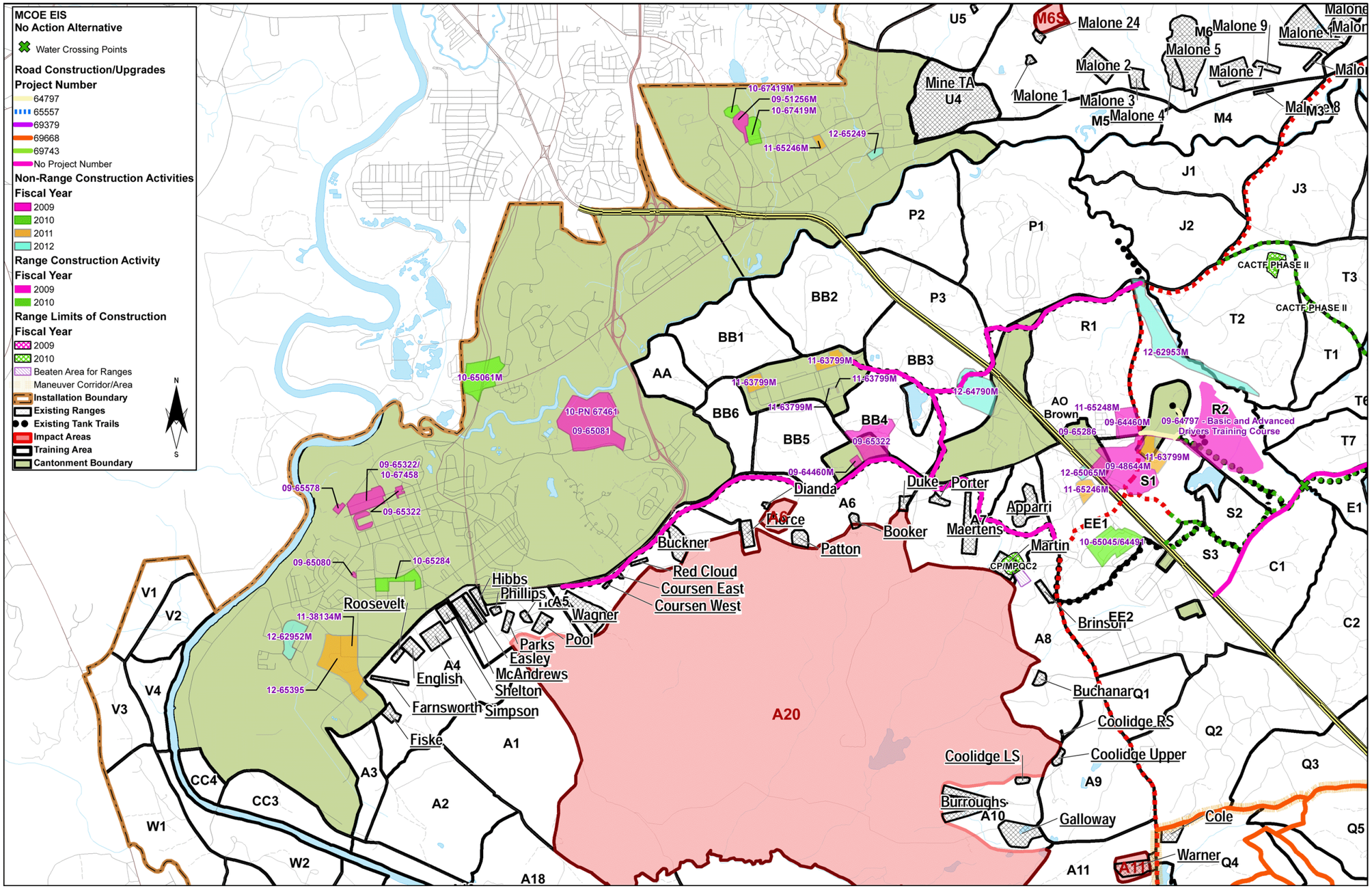


Figure 3.4-5: MCOE EIS No Action Alternative Cantonment Areas

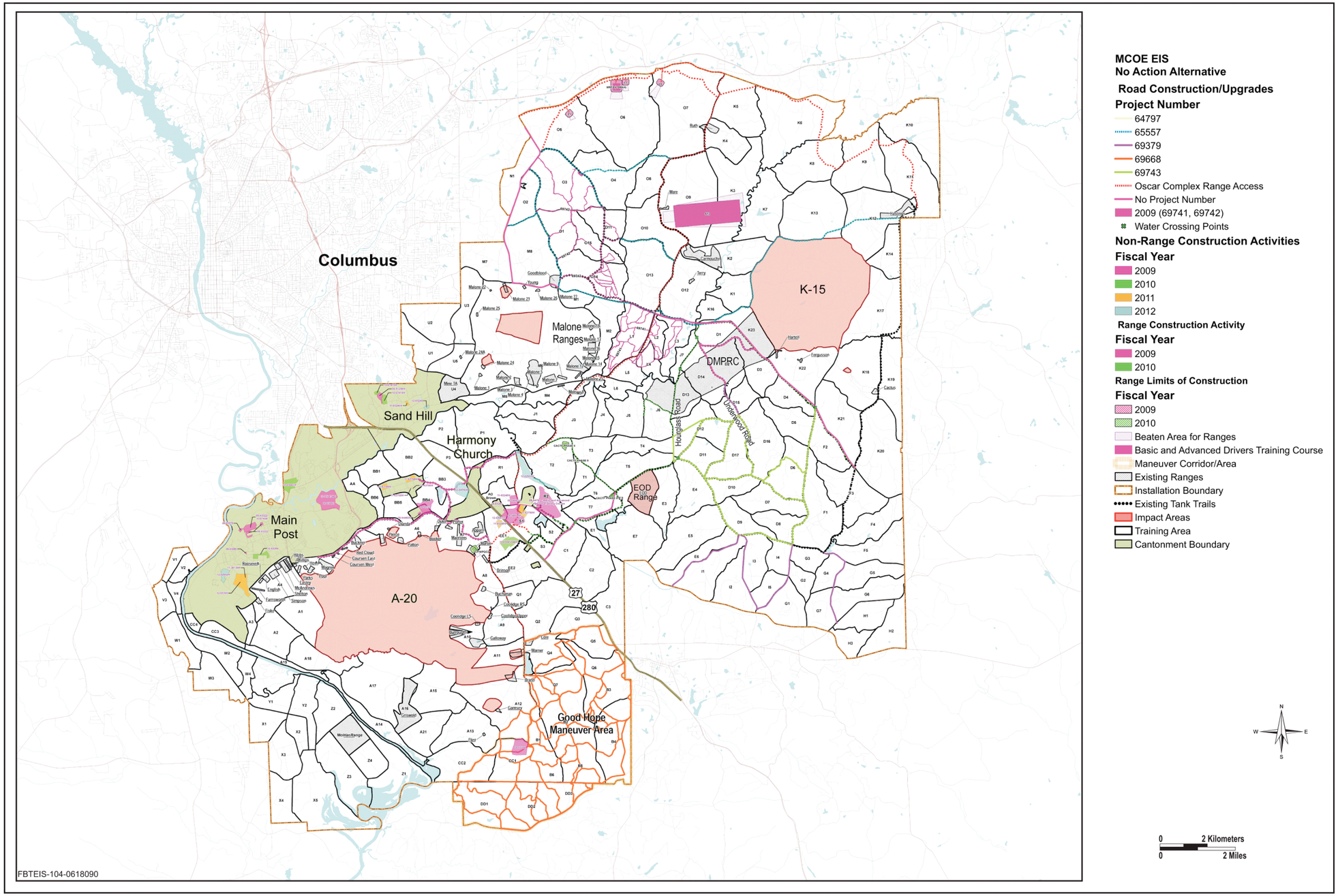


Figure 3.4-6: MCOE EIS No Action Alternative Ranges and Training Areas

CHAPTER 4

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Potential environmental impacts cannot be determined without first understanding the existing conditions in the affected environment. For this reason, the impact analysis process involves two steps. First, this EIS helps the reader develop an understanding of the existing environmental setting and conditions by identifying the "affected environment" or "region of influence" (ROI). The geographic extent of this area is determined by the potential for impacts, due to construction, operations, and/or maintenance, associated with the various resources. The ROI can change depending on the resource category. For instance, soils may be impacted within Fort Benning so the ROI would be those soils where there is the potential for downstream sediment transport due to erosion; however, the air quality affected environment and ROI would be the geographic extent that emissions would likely impact the regional air quality. Second, the EIS uses details of the alternatives (see Section 3) to assess their impacts on the existing environment, or the "environmental consequences." As required by NEPA and Army implementing regulations, this EIS addresses impacts associated with the No Action Alternative, as well as the two action alternatives—A and B, as compared to baseline conditions. To better evaluate existing conditions and impacts, numerous studies and/or surveys were undertaken. A summary follows:

Socioeconomics Assessment – Impacts to the local community were assessed using the U.S. Army Economic Impact Forecast System (EIFS) modeling program. The results were integrated into the Section 4.5 Socioeconomics, and presented in Appendix B.

Transportation Survey – Installation cantonment-area roads were evaluated to establish their ability to support the influx of personnel and families associated with the Transformation action. The results are presented in Section 4.6, Transportation and in Appendix C.

Noise – The Fort Benning Range Division submitted small arms and large caliber operational data information to U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) detailing current and future rounds fired on Fort Benning (see Appendix D); this information was used to generate noise contours which are presented in Section 4.8 Noise.

Air Quality – Emissions generated as a result of Transformation construction activities, as well as those associated with operations and maintenance were examined. Results are summarized in Section 4.9, Air Quality and criteria used to reach these results are found in Appendix E.

Wetlands and Stream Crossing Identification – Wetlands delineation and stream crossing determinations will be conducted on all of the proposed constructions sites where wetlands or stream crossings occur. In some cases, this work has already been done. In other cases, additional field work will be necessary to confirm either the exact acreage of wetlands or the exact number and location for water crossings. This information in terms of exact acreages of jurisdictional wetland and stream impacts will be forwarded to the Albany Field Office of the USACE Regulatory Division, for that agency's permit processing and evaluation. Results are presented in Section 4.13, Biological Resources.

Special Status Species Surveys – These included surveys of the federally-protected Red-cockaded Woodpecker (RCW) and relict trillium, and the state-protected gopher tortoise. Results of these surveys are summarized in the Section 4.13, Biological Resources. In the event that the USFWS determines that the action as proposed may result in jeopardy to a listed species, the USFWS may provide actions the agency can implement to avoid jeopardy.

Biological Assessment – On November 7, 2008, Fort Benning submitted a BA to the USFWS to initiate formal assessments concerning the effects of this action on federally-listed species. The BA Executive Summary is attached in Appendix F. The BA and appendices are available for review at the following website*:* https://www.infantry.army.mil/EMD/program/legal/index.htm.. The BA can also be found the following local libraries: Chattahoochee Valley Regional Library, Columbus Public Library, Fort Benning Main Post Library, Harris County Public Library, Phenix City Public Library, Richland Public Library, and South Columbus Public Library.

Cultural Resources Surveys – Cultural resources surveys (Phase I and/or II) have been conducted to be used for cultural resources assessments. Results are presented in Section 4.14, Cultural Resources. Formal consultation with both the GA State Historic Preservation Office (SHPO) and the Tribes has been requested regarding the potential impacts to and protection of these sites (Appendix G). Appendix G also contains the cultural resource Executive Summary of the document to be used for Section 106 consultation. The complete document contains sensitive information on archaeological sites and, therefore, will not be distributed to the public in accordance with Section 9 of the Archaeological Resource Protection Act (ARPA) and Section 304 of the National Historic Preservation Act (NHPA).

The potential environmental consequences of the alternatives to the 13 resources are presented in this Section followed by an examination of cumulative impacts.

4.1.1 Procedural Requirements and Consultation

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA), the Army must consult with the Secretary of the Interior to ensure that implementation of the proposed action is not likely to jeopardize the continued existence of any federally listed species or result in the destruction or adverse modification of designated critical habitat listed. Formal consultations are required prior to federal agencies authorizing, funding, or implementing proposed actions that may adversely affect a listed species or its critical habitat. Critical habitat for the shiny-rayed pocketbook mussel occurs near the Installation. However, Fort Benning has determined through the BA that there will be no effect on this critical habitat and therefore it will not be discussed further in this EIS. Several federally-listed species are found within Installation boundaries and a BA has been prepared as noted above. This EIS presents analyses of the potential impact to federally listed species as a result of the proposed action and alternatives. Under formal consultation, the USFWS has up to 90 days to review and consult with Fort Benning, with an additional 45 days for the USFWS to prepare a BO (135 days total). The BO provides the following: 1) the written opinion of the USFWS as whether or not a Federal Action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical

habitat; 2) a summary of the information on which the opinion is based; 3) a detailed discussion of the effects of the action on listed species or designated critical habitat; and 4) the incidental take statement regarding the direct and indirect "takes" associated with the reasonable and prudent alternative for the Proposed Action. The BO provides measures that the USFWS deem should be implemented in conjunction with the preferred alternative to avoid or minimize impacts. The USFWS also may provide in the BO nonbinding conservation recommendations. In the event that the USFWS determines that the action may result in jeopardy to a listed species, the USFWS may provide actions the Army can implement to avoid jeopardy.

Section 106 of the NHPA requires all federal agencies to take into account the effects of their actions on properties listed or eligible for inclusion on the National Register of Historic Places (NRHP). The Advisory Council on Historic Preservation (ACHP) is also provided an opportunity to comment on those actions and their potential effects. The proposed action is subject to Section 106 review. In accordance with the ACHP's implementing regulation (36 CFR Part 800), the Army is required to consult with the GA SHPO, and federally recognized American Indian Tribes affiliated with the Fort Benning areas (Tribes) about the potential effects on eligible properties. Fort Benning uses the Army Alternate Procedures (AAP) (as allowed under 36 CFR 800.14) for compliance with Section 106 of the NHPA, as detailed in Fort Benning's Historic Property Component Plan (Fort Benning 2006b). Alternate procedures include, among other actions, timely consultation with Stakeholders through NEPA documentation and processes should adverse effects to historic properties be expected; however, only yearly summaries of actions are required if these actions are determined by Fort Benning to have no adverse effect. Only those historic properties determined eligible for, or already on, the NRHP are managed with preference for avoidance of impacts as feasible. Evaluations of historic properties to determine eligibility for their inclusion on the NRHP will be completed prior to any disturbance by proposed action activities. The Army is seeking input and concurrence from GA SHPO and Tribes through the NEPA process and this EIS. Based on this input, Fort Benning will decide on the appropriate level of mitigation.

The 1972 amendments to the Federal Water Pollution Control Act (FWPCA), also referred to as the Clean Water Act (CWA), prohibit the discharge of any pollutant to waters of the United States from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Efforts to improve water quality under the NPDES program have focused traditionally on reducing pollutants in discharges from industrial and municipal wastewater treatment plants. Prior to 1990, efforts to address storm water discharges under the NPDES program have generally been limited to a few industrial categories with storm water effluent limitations.

Phase I of the USEPA's storm water program was issued in 1990 under the CWA. Phase I relies on NPDES permit coverage to address storm water runoff from: 1) "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater; 2) construction activity disturbing 5 acres of land or greater; and 3) 11 categories of industrial activity. Georgia has been delegated the NPDES program and is therefore responsible for implementation of a program to control

storm water discharges. GEPD has issued NPDES MS4 permits for Phase I large and medium municipal areas and a general permit for the 11 categories of industrial activity. A general permit for construction activity disturbing 5 acres of land or greater was promulgated by GEPD on June 12, 2000 with an effective date of August 1, 2000. As noted below, the acreage threshold requiring permitting from the GEPD was subsequently reduced to 1 acre.

On December 8, 1999 USEPA published the Storm Water Phase II Final Rule, which expanded the Phase I program by requiring additional operators of small MS4s and operators of small construction sites (1 to 5 acres) be covered by NPDES permits and to implement programs and practices to control polluted storm water runoff. In conjunction with the federal regulations, GEPD amended the Georgia Rules and Regulations for Water Quality Control (Rules) in April 2001 to incorporate all Phase II regulations.

GEPD has re-issued three NPDES general permits that authorize the discharge of storm water from three distinct types of construction activity. These permits became effective in August of 2008, and regulate all construction activity disturbing 1 or more acres. The first permit regulates stand-alone construction activity (100001); the second regulates infrastructure (i.e., linear) construction sites (100002); the third regulates common development construction (100003). Each permit contains significant common language and requirements as well as individual differences specific to each type of activity.

The permits were issued pursuant to the authority contained in the Official Code of Georgia Annotated (O.C.G.A.) Sections 12-5- 27 and 12-5-30. As required, the permits incorporated the applicable provisions of O.C.G.A. Section 12-7-6. The permits require regulated activities to perform turbidity sampling on all receiving water(s), or all storm water outfalls, or a combination of receiving water(s) and outfall(s). The numbers applicable to alternative outfall monitoring were established as estimated surrogates for the otherwise applicable in-stream turbidity levels using statewide average factors.

The permits define construction activities as those disturbing areas 1 acre or greater of size, or tracts of less than 1 acre that are part of a larger overall development with a combined disturbance of 1 acre or greater (i.e., common plan of development or sale). GEPD can require applicants to submit an NPDES permit application for an individual NPDES permit upon written notification to the applicant. In addition to storm water discharges, the general NPDES permits authorize certain non-storm water discharges such as fire fighting water and uncontaminated groundwater. The general permits are valid for a term of 5 years.

The major provisions of the proposed permits include a notification of the facility/site's intent to comply with the permit by submitting a NPDES NOI, an Erosion, Sedimentation and Pollution Control Plan (ESPCP), and implementation of this Plan. Coverage under the permits is achieved by submitting a NOI to GEPD by the permittee(s). A permittee structure for common developments remains similar to the previous permit. A primary permittee is the facility/site owner or operator. A secondary permittee is a home builder, a utility contractor, or similar entity conducting land disturbance activities within a common development. Both stand-alone and infrastructure construction activities have primary permittees only. NOIs are required to be submitted to GEPD by all permittees at least 14 days prior to the

commencement of the construction activity, with certain exceptions specified in the permits. The NOI includes basic information about the facility/site including the specific waters of Georgia where the discharges will occur, except in the case of Blanket NOIs for utility companies and utility contractors that are secondary permittees. Specific forms are available from GEPD and must be used for the NOI. Coverage by the general NPDES permit is provided without acknowledgment from GEPD. When final stabilization of the facility/site is achieved, the permittee must notify GEPD they are terminating coverage under the general NPDES permit by submitting a Notice of Termination.

Permittees must maintain records of their activities relative to compliance with the terms and conditions of the proposed general NPDES permits. These records include copies of the NOI, plan, site inspections, sampling results, and Notice of Termination. For new facilities/sites disturbing more than 50 acres, the Plan must be submitted to GEPD with the NPDES NOI. For new facilities/sites disturbing between 1 and 50 acres and where there is no local issuing authority pursuant to the Georgia Erosion and Sedimentation Act, the plan must be submitted to GEPD with the NPDES NOI.

No federal agencies or other entities requested cooperating status on this EIS. Fort Benning informally checked with the Army Corps of Engineers, Savannah District, to determine if they wanted to be a cooperating agency specifically for assistance with wetland-related issues, but the Corps determined that the regulatory process would suffice for their interaction and assistance. No other federal agencies or other entities requested cooperating agency status on this EIS; therefore, no procedural requirements for cooperating agencies apply.

In addition to the completed and signed ROD for this proposed action, the BO must be issued and other permits for specific projects, such as those for the protection of wetlands, water quality, air quality, etc., must be in place prior to breaking ground on any of those projects in the proposed action of this MCOE EIS.

4.1.2 Relevant Statutes, Executive Orders, and Permits

In accordance with CEQ NEPA regulations (40 CFR 1502.25), the Army has prepared this EIS concurrently with environmental impact analyses and related surveys and studies required by the Fish and Wildlife Coordination Act (16 U.S. Code [USC] 661 *et seq.*), the NHPA of 1966 (16 USC 470 *et seq.*), the ESA of 1973 (ESA, 16 USC 1531 *et seq.*), and other environmental review laws (and their implementing regulations), and Executive Orders (EOs) outlined by environmental resource in Table 4.1-1.

Table 4.1-1: Other Major Environmental Statutes, Regulations, and Executive Orders Applicable to Federal Projects

Environmental Resources	Statute, Regulation, or Executive Order
Air Quality	Clean Air Act (CAA) of 1970 (PL 95-95), as amended in 1977 and 1990 (PL 91-604); U.S. Environmental Protection Agency (USEPA), Subchapter C-Air Programs (40 CFR 52-99); 40 CFR Part 63 , National Emissions Standards for Hazardous Air Pollutants (NESHAP); Georgia Rules for Air Quality Control (Chapter 391-3-1).
Noise	Noise Control Act of 1972 (PL 92-574) and Amendments of 1978 (PL 95-609); USEPA, Subchapter G-Noise Abatement Programs (40 CFR 201-211).
Geology and Soils	NPDES Construction Activity General Permit (40 CFR 122-124); Georgia Erosion and Sediment Control Act of 1975.
Water Resources	FWPCA of 1972 (PL 92-500) and Amendments; CWA of 1977 (PL 95-217); NPDES Construction Activity General Permit (40 CFR 122-124), NPDES Industrial Permit and NPDES Municipal Separate Storm Sewer System (MS4) Permit; CWA 40 CFR 112 Spill Prevention Control and Countermeasure (SPCC); USEPA, Subchapter D-Water Programs (40 CFR 100-145); Water Quality Act of 1987 (PL 100-4); USEPA, Subchapter N-Effluent Guidelines and Standards (40 CFR 401-471); Safe Drinking Water Act (SDWA) of 1972 (PL 95-923) and Amendments of 1986 (PL 99-339); USEPA, National Drinking Water Regulations and Underground Injection Control Program (40 CFR 141-149).
Biological Resources	Migratory Bird Treaty Act (MBTA) of 1918; Fish and Wildlife Coordination Act of 1958 (PL 85-654); Sikes Act of 1960 (PL 86-97) and Amendments of 1986 (PL 99-561) and 1997 (PL 105-85 Title XXIX); ESA of 1973 (PL 93-205) and Amendments of 1988 (PL 100-478); Fish and Wildlife Conservation Act of 1980 (PL 96-366); Lacey Act Amendments of 1981 (PL 97-79); Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186).
Wetlands and Floodplains	Section 401 and 404 of the FWPCA of 1972 (PL 92-500); USEPA, Subchapter D-Water Programs 40 CFR 100-149 (105 ref); Floodplain Management-1977 (EO 11988); Protection of Wetlands-1977 (EO 11990); Emergency Wetlands Resources Act of 1986 (PL 99-645); North American Wetlands Conservation Act of 1989 (PL 101-233).
Cultural Resources	NHPA (16 USC 470 *et seq.*) (PL 89-865) and Amendments of 1980 (PL 96-515) and 1992 (PL 102-575); Protection and Enhancement of the Cultural Environment-1971 (EO 11593); Indian Sacred Sites-1966 (EO 13007); American Indian Religious Freedom Act (AIRFA) of 1978 (PL 94-341); Antiquities Act of 1906; ARPA of 1979 (PL 96-95); Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (PL 101-601); Protection of Historic Properties (36 CFR 800) – Fort Benning has a Historic Properties Component of the Integrated Cultural Resource Management Plan (ICRMP) in lieu of these regulations for Section 106 compliance of the NHPA (Fort Benning 2004a).
Hazardous and Toxic Substances and Waste	Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-5800), as Amended by PL 100-582; USEPA, subchapter I-Solid Wastes (40 CFR 240-280); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 USC 9601) (PL 96-510); Toxic Substances Control Act (TSCA) (PL 94-496); USEPA, Subchapter R-Toxic Substances Control Act (40 CFR 702-799); Federal Insecticide, Fungicide, and Rodenticide Control Act (40 CFR 162-180); Emergency Planning and Community Right-to-Know Act (40 CFR 300-399); Federal Compliance with Pollution Control Standards-1978 (EO 12088), Superfund Implementation (EO 12580); Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (EO 13101), Greening the Government Through Efficient Energy Management (EO 13123), Greening the Government Through Leadership in Environmental Management (EO 13148); Georgia Hazardous Waste Management Act.
Socioeconomics	Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898); Protection of Children from Environmental Health Risks and Safety Risks (EO 13045).

4.1.3 Methodology

The impact analysis process requires collecting scientifically valid and up-to-date information. Data collection involves:

- reviewing previous studies, such as technical publications, agency databases, management plans, and other NEPA documents;
- talking to agencies and others with information on specific resources, such as the USFWS, U.S. Army Corps of Engineers (USACE), Georgia DNR, GA SHPO, American Indian Tribal representatives, and community planners;
- reviewing public input during the scoping process; and
- conducting field studies.

Many resources analyzed in this EIS are interdependent. For example, a change in soils might affect local vegetation, which in turn could affect wildlife that depends on the plants for food. The increase in range operations might affect noise conditions around the Installation and changes in noise could affect adjacent neighbors and wildlife. These types of interrelationships are recognized in 40 CFR 1502.6, which states "environmental impact statements shall be prepared using an inter-disciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts." The resources identified in this MCOE EIS for analysis are the same as those used in the BRAC/ Transformation EIS for consistency and comparability of impact purposes.

Assessment of environmental consequences is also based on an understanding that different resources are not equally sensitive to all elements of an action. For example, cultural resources—especially archaeological sites—are most likely affected by activities that disturb the ground (such as facility and range construction) and are usually not affected by noise. On the other hand, certain animal species may be more sensitive to short-term construction activities than long-term exposure to noise increases.

This MCOE EIS adopts an analytic methodology similar to that used in both the Programmatic Environmental Impact Statements for Army Growth and Force Structure Realignment (USAEC 2007) and Army Transformation (USACE 2002b). The PEISs identified several types of activities that were likely to create impacts (e.g., construction/demolition, operations, and maintenance activities). The activity groups were adopted and updated for application in the environmental impact analysis process associated with this EIS. The four activity groups are: 1) cantonment-area construction; 2) range and training area construction to include live-fire and dudded ranges, heavy maneuver training, as well as construction and/or upgrades of tank trails and roads; 3) day-to-day training operations; and 4) maintenance activities associated with equipment/vehicle maintenance units and for roads, trails, ranges, and impact areas. It is important to note that establishing the Valued Environmental Components (VECs') level of potential impact is the fundamental step at the onset of the environmental analyses. Those VECs that have very low or low potential impacts do not need to be considered in detail during the assessment phase. Those VECs that have a medium or higher anticipated environmental impact need substantially more analysis. Table 4.1-2 presents the 13 resource categories analyzed during planning for

the MCOE EIS in November 2007 and indicates the level of impact anticipated under the two action alternatives. Five categories are used to describe the level of impact:

- Very Low – No impact or minor impacts are anticipated.
- Low – Minor impact anticipated.
- Medium – Moderate impact anticipated (less than significant).
- High – Significant impact potential anticipated (likely to be mitigated to less than significant).
- Very High – Significant adverse impact anticipated (mitigation would be applied to minimize adverse effects).

Table 4.1-2: VECs Screening Matrix for Alternatives A and B as of November 2007

Resource	***Proposed Action Elements***							
	Cantonment Area Construction/Demolition		Range/Training Area Construction/Demolition		Training Operations		Maintenance Activities	
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**
Land Use and Management	Low	Low	Medium	Medium	Low	Low	Low	Low
Aesthetics and Visual	Low	Low	Low	Low	Low	Low	Low	Low
Socioeconomics								
Economic Development	Medium	Medium	Medium	Medium	Low	Low	Low	Low
Demographics	Low	Low	Low	Low	Low	Low	Low	Low
Housing	Low	Low	Low	Low	Low	Low	Low	Low
Quality of Life	Low	Low	Low	Low	Low	Low	Low	Low
Environmental Justice	Low	Low	Low	Low	Low	Low	Low	Low
Protection of Children	Low	Low	Low	Low	Low	Low	Low	Low
Transportation/Traffic	Medium	Medium	Medium	Medium	Low	Medium	Low	Low
Utilities	Low	Low	Low	Low	Low	Low	Low	Low
Noise	Low	Low	Low	Low	Medium	Medium	Low	Low
Air Quality	Medium	Medium	Medium	Medium	Low	Low	Low	Low
Hazardous and Toxic Materials and Waste	Low	Low	Low	Low	Low	Low	Low	Low
Water Resources (Quality)								
Wetlands	Medium	Medium	High	High	Medium	Medium	Low	Low
Rivers and streams	Low	Low	Medium	Medium	Medium	Medium	Low	Low
Ground Water	Low	Low	Low	Low	Low	Low	Low	Low
Floodplains	Low	Low	Low	Low	Low	Low	Low	Low
Storm water	Medium	Medium	Medium	Medium	Low	Low	Low	Low
Geology and Soils	Medium	Medium	Medium	Medium	Low	Low	Low	Low
Biological								
Vegetation	Low	Low	Medium	Medium	Medium	Medium	Low	Low
Aquatic Habitats	Low	Low	Medium	Medium	Medium	Medium	Low	Low
Fish and Wildlife	Low	Low	Medium	Medium	Medium	Medium	Low	Low
Special Status Species	Medium	Medium	High	High	Medium	Medium	Medium	Medium
Unique Ecological Areas	Low	Low	Medium	Medium	Low	Low	Low	Low
Cultural Resources	Low	Low	Medium	Medium	Low	Low	Low	Low
Safety	Low	Low	Low	Low	Low	Low	Low	Low

Existing natural, cultural, pollution prevention, solid waste, hazardous materials/wastes, and erosion/ control management plans (further identification of plans is provided within the specific resource sections), prescribed Installation procedures, as well as local, state, and federal permit requirements are *not* considered specific mitigation measures because they are part of the existing management regime to implement requirements of laws or regulations, and will be undertaken regardless of the level of impacts. These ongoing management regimes are part of the proposed action alternatives and are described under the affected environment and/or environmental consequences for the specific resources. Mitigation for potential adverse impacts, when applicable, is also discussed within each resource on any of those projects in the proposed action of this MCOE EIS. Mitigation measures, per the CEQ and Army NEPA regulations, may include avoidance of effect; minimization of effect; repair, rehabilitation, or restoration of effect; reduction of effect; and/or compensation for effect.

Cumulative impacts are presented in this section as well. The alternatives are evaluated for incremental impacts when considering the past, present, and reasonably foreseeable actions within Fort Benning and the adjacent communities.

4.2 TRAINING OPERATIONS

This section on Training Operations provides necessary background and description of the training that currently occurs at Fort Benning and will be affected by the proposed MCOE actions. The information presented below gives an overview for the interested public of the Army's goals for Fort Benning and the facilities and training necessary to meet those goals. While technically not an environmental resource category, it is important that training operations be given due consideration as the action alternatives fulfill the needs and purpose of the Proposed Action differently and therefore a comparative analysis for each alternative is helpful.

Fort Benning's overall goal is to:

- Produce the best trained and equipped Soldiers in the world.
- Facilitate Modularity to complete the Army Chief of Staff's vision.
- Transition modular maneuver forces into the future.
- Support Future Combat Systems development and spin out technology integration.
- Implement "Soldier as a System" as a means to develop requirements and equip Soldiers.
- Improve the quality of life for Soldiers, Civilians, and Family members who live and work on Fort Benning by providing world class ranges, training facilities, housing, and recreational facilities. Medical and dental care will be of the highest quality.
- Transform the U.S. Army Infantry Center and U.S. Army Armor Center into a Maneuver Center of Excellence (Fort Benning 2008a).

The Armor and Infantry Schools and Centers are consolidating and will come under the command of MCOE. The MCOE mission is to provide the nation with the world's best trained Infantry and Armor Soldiers and adaptive leaders imbued with the warrior ethos; provide a power projection platform capable of deploying and redeploying Soldiers, civilians, and units anywhere in the world on short notice; and define the required capabilities for Infantry and Armor to meet the needs of the future force (Fort Benning 2008b).

Infantry School and Center. Since the establishment of the Infantry School at Fort Benning in 1918 (when it was moved to Fort Benning from Fort Sill, Oklahoma), it has had a far-reaching impact in training our armed forces. Even Soldiers never stationed or assigned temporary duty at Fort Benning were exposed to the training standards, Field Manuals, and textbooks published by the Infantry School. With the Infantry, the so-called "Queen of Battle," as the Post's nucleus, Fort Benning has added other significant missions over the years, including: Airborne School, where Soldiers learn to engage in battle from the sky; Ranger School, where Soldiers learn advanced warfare tactics and skills; and the 197th Infantry Brigade (previously the 29th Infantry Regiment), where Soldiers learn how to operate and maneuver the Bradley Fighting Vehicle (BFV) in combat. Fort Benning's 36th Engineer Group has been at the forefront of the Army's Post-Cold War mission of providing aid; and Fort Benning future

technology in Battlelabs is shaping the way the military of the 21st Century will fight its wars (Fort Benning 2008a).

Fort Benning supports the Training and Doctrine Command (TRADOC) mission to conduct initial entry training for Infantry Soldiers, basic- and advanced-level noncommissioned officer (NCO) and officer training courses, the Army's airborne and Ranger schools; and continued study, testing, and development of future joint and combined infantry doctrine. Fort Benning also conducts initial entry training for Infantry Soldiers and officers in weapon systems, tactics, techniques, and procedures. Further, Fort Benning provides the home station training facilities for Forces Command's (FORSCOM's) 3rd Brigade, 3rd Infantry Division; Special Operations Command's (SOCOM) 75th Ranger Regiment; and numerous other active duty deployable units. It is also the home to the Western Hemisphere Institute for Security Cooperation, which has the mission to train cadets, NCOs, and officers from numerous Latin American countries.

Armor School and Center. The Armor School's mission is to provide basic combat training to Soldiers and Marines in tank and fighting vehicle operation, weapons system deployment, and armor vehicle maintenance. Armor crewmen (tankers) work as part of a team to operate armored equipment and fire weapons to destroy enemy targets. During peacetime, armor units must stay ready to defend the United States and U.S. national interests and international policy, anywhere in the world. During combat, their role is to operate tanks and amphibious assault vehicles to engage and destroy the enemy. Tanks (like the M1A1 and M1A2 Abrams) use mobility, firepower, and shock effect to engage enemy forces.

The Armor Center consists of agencies, directorates, and units that oversee and support operations for the Armor Force; most of these activities are of an administrative nature and would not require the breadth of facility and range construction found with the establishment of the Armor School (Fort Knox 2008).

Baseline workforce and student levels at Fort Benning are shown in Table 4.2-1 and reflect conditions as of March 2008.The increase of student population as a result of the BRAC/Transformation is not slated until 2009.

Table 4.2-1: Baseline Workforce Levels and Student Populations

Military	Civilian	Students*	Total
17,771	8,690	9,386	35,847

Sources: Fort Benning 2006b and 2006c
Note: *student totals represent the average daily number of students on Fort Benning.

Baseline student training throughput (or the average number of students that are trained throughout the year on any given day) is noted in Table 4.2-2. Again, note that there are no increased numbers of students associated with the BRAC/Transformation actions until 2009 and are not included in the baseline conditions. Increase of student population as a result of the BRAC/Transformation actions are reflected in the No Action Alternative (Section 4.2.2.1).

Table 4.2-2: Baseline Training Throughput

Type of Training	Student Numbers
Infantry School	
Total Student Input	29,915
Daily Average Load	3,305
Infantry Training Brigade	
Total Student Input	19,256
Daily Average Load	5,008
Basic Combat Training Brigade	
Total Student Input	5,319
Daily Average Load	946
Western Hemisphere Institute for Security Cooperation (WHINSEC)	
Total Student Input	450
Daily Average Load	97
Medical Department Activity (MEDAC)	
Average Load	30

Source: Fort Benning 2006b.

4.2.1 Baseline Training Conditions

Training Assets. To support the numerous training and operational missions at the Post, Fort Benning offers the following:

- 38 basic marksmanship ranges (ranges used to qualify or train on rifles, pistols, sniper rifles, grenade launchers, sub-caliber light anti-armor weapons, shotguns, machine guns, and grenade machine guns);
- 9 direct live fire gunnery ranges (ranges used to qualify and train tank and Bradley crews, including ranges used to qualify anti-armor weapons systems using service ammunition);
- 19 collective live fire ranges (ranges used for collective training events, such as Infantry Squad Battle Course (ISBCs) and Infantry Platoon Battle Course (IPBCs), multi-purpose training ranges, and aerial gunnery ranges);
- 36 indirect firing facilities (ranges or dedicated firing points used for the qualification and training of mortars, field artillery, or air defense artillery and observation Posts);
- 7 special live fire ranges (ranges and training areas used for qualification and training of demolitions, live hand grenades, and claymores);
- 21 other, non-live fire facilities (assets that are used to train Soldiers without the use of weapons such as rappel towers, drop zones, obstacle courses, gas chambers, and other facilities not covered in the previous categories);
- 35 drop/landing zones;
- 83 light maneuver training areas (48,171 designated acres);
- 86 heavy maneuver training areas (62,958 designated acres);
- 15,554-acres, two dudded impact areas A-20 and K-15 (live ordnance impact area with the potential to produce unexploded ordnance (UXO); and

- 30,342-acres non-dudded impact areas (inert ordnance impact area without potential to produce UXO) that can be used for light maneuver training (Fort Benning 2006a).

The Digital Multi-Purpose Range Complex (DMPRC) will provide a state-of-the-art range facility by meeting the Installation's training needs for conducting effective advanced gunnery exercises in a realistic training environment expected by the fall of 2010. Changes in training on other existing ranges (Carmouche and Hastings) will occur to incorporate the new DMPRC. Basic and intermediate Tank and BFV training will take place at the Carmouche and Hastings ranges.

Since the completion of the Transformation EIS, Fort Benning has started construction on several ranges including a fire and movement range, one modified record fire ranges, and a stationary tank range.

Operations. To fulfill the variety of Fort Benning missions, more than 200 training ranges and maneuver areas are available for Soldier training. Training operations include a variety of weapons systems from small arms to field artillery. Table 4.2-3 provides an overview of small caliber (i.e., munitions used in rifles, pistols, shotguns, and grenade launchers) and large caliber weapons (i.e., inert and high explosive field artillery and mortar shells from howitzers, tanks, and BFVs) used on the various ranges up to and including the Baseline Condition described in Section 3.

Table 4.2-3: Baseline Annual Weapons Use

	Day	Night	Total
Small Caliber	35,200,000	3,480,000	38,680,000
Percent Day/Night	91%	9%	
Large Caliber	472,000	59,000	531,000
Percent Day/Night	87%	13%	

Source: USACHPPM 2008.

In addition to small- and large-caliber weapon system training, Soldiers train alongside the M1 Abram tanks, M2s, BFVs, Strykers, High Mobility Multipurpose Wheeled Vehicles (HMMWVs), and other tactical vehicles (e.g., tractor-trailer combinations, troop transport vehicles, and a variety of trailers for water and fuel transport) (Fort Benning 2007a). Fort Benning currently supports 2,595 pieces of equipment in its inventory (Fort Benning 2007a); of these, 1,079 are vehicles (Table 4.2-4).

Table 4.2-4: Baseline Vehicle Inventory

Vehicle	Type	Existing
Tracked Armor Equipment	Tanks, Armored Personnel Carriers, BFVs, Recovery Vehicles, Tanks With Assault Bridges, And Mine Clearers	201
Wheeled Heavy Equipment	Stryker, HMMWVS (Carriers, Cargo, Armament, And Heavy Weight Trucks)	328
Wheeled Heavy Trucks	Heavy Cargo Equipment Transport, Fuel Tankers, Wrecker/Recovery Vehicles	141
Wheeled Trailers	Low-Bed Trailers For Armaments, Water, And Utility Towing	216
Wheeled Medium/Light Trucks	Fork Lifts, Cargo, And General Personnel Carriers	193
	Total Vehicles	**1,079**

Note: Numbers represent levels as of March 2008 (USACE 2007a).

Fort Benning is also home to the airborne school and Lawson Army Airfield (AAF), which supports both fixed-wing and rotary aircraft. While no additional aircraft would be associated with the Proposed Action, these baseline airfield operations contribute to the Installation mission and consequently to its noise environment.

Fort Benning Ongoing Environmental Protection Process for Training Activities. To address the potential for ongoing training activities to adversely affect the natural and cultural resources on Fort Benning, an environmental review of the training plan must occur prior to any on-the-ground activities. In accordance with Army NEPA Regulation, Headquarters U.S. Army Infantry Center Regulation 210-4, and Fort Benning Installations Range and Terrain Regulation (U.S. Army 2005b), all training activities must be preceded by the timely submission of a completed Fort Benning Form 144-R, Request for Environmental Analysis by the Fort Benning user/proponent, to the Environmental Division, Directorate of Public Works (DPW). The Form must include a training plan and provide sufficient detail of the training scenario to allow for a comprehensive analysis of the potential impact on the environment. The potential environmental resource impacts include impacts to vegetation, threatened and endangered species, historical/archeological sites, soil erosion, wetland protection, hazardous materials spill prevention and/or control, noise management, etc. Even when existing NEPA documentation adequately covers a proposed training action, submission of the Form is still required. Repetitive actions, such as those scheduled for the same sites by the same units, using the same training scenarios, involving the same amount of troops, equipment, supply, ammunition, etc., are required to be submitted for environmental review and concurrence on a periodic basis (not to exceed 12 months). Environmental Division reviews these submittals and renders concurrence/non-concurrence with the proposed training activities. The concurrence may include conditions such as avoidance of sensitive areas, spill protocols, etc. A non-concurrence is accompanied by reasons and conditions under which alternatives to the submittal can be favorably considered before the training can take place. In cases where restrictions identified by the Environmental Division may adversely impact training, Fort Benning Environmental Division, training, and range personnel explore options to modify the exercise to meet mission needs and environmental requirements (U.S. Army 2005b). Following training activities, the area is surveyed by the Range Safety Officer to ensure safety and environmental compliance. If noncompliance is identified, the impact is reported via the Environmental Incident Report Form and mitigated per Environmental Division direction. These processes and all other existing regulations (e.g., special status species protection, spill prevention, sedimentation controls) will remain in place and will be used to evaluate the training exercises both before and after they take place at Fort Benning under the Proposed Action.

Role of Integrated Training Area Management Program. Another tool used to manage resources and to minimize impacts to the environment (associated with training and operations), is the Integrated Training Area Management (ITAM) program. ITAM provides the Army with the capabilities to manage and maintain training and testing lands by integrating mission requirements with environmental and land management practices. The objectives of the Army's ITAM program are to:

- Achieve optimal sustained use of lands for the execution of realistic training and testing by providing a sustainable core capability that balances usage, condition, and level of maintenance.
- Implement a management and decision-making process that integrates Army training and other mission requirements for land use with sound natural resources management.
- Advocate proactive conservation and land management practices by aligning Army training land management priorities with the Army training and readiness priorities.

The ITAM program is formalized in Army Regulation 350-19, *The Army Sustainable Range Program,* which lays the groundwork and established responsibilities and procedures for the Sustainable Range Program (U.S. Army 2005c).

4.2.2 Environmental Consequences

This section is intended to provide important background information and overview of the Army's goals for Fort Benning and the facilities and training necessary to meet those goals. At the same time, Training Operations are not considered a VEC and therefore no threshold of significance is applicable. A description of the consequences on mission and operations, however, for each alternative is presented.

4.2.2.1 No Action Alternative

Under the No Action Alternative, environmental protection and ITAM procedures found under the baseline conditions would continue, so no impacts are anticipated for these facets of training operations and land management.

Mission. The missions and eventual consolidation of the Armor and Infantry Schools and Centers would still exist as described above in Baseline Conditions. Upon completion of implementing the BRAC/Transformation actions in 2013, the total workforce will have increased to 52,461 personnel. Table 4.2.-5 shows the breakdown of military, civilian, and student personnel under the No Action Alternative. Table 4.2-6 presents annual student throughput and represents the end state following BRAC/Transformation actions.

Table 4.2-5: MCOE EIS No Action Alternative Workforce Levels and Student Populations

	Military	Civilian	Students	Total
Baseline	17,771	8,690	9,386	35,847[1]
BRAC/Transformation	5,605	3,771	7,238	16,614[2]
Total	23,376	12,461	16,624	52,461

Sources: USACE 2007a.and 2007b.
Notes: [1] From USACE 2007a, Table on p. 3-25.
[2] From USACE 2007a, Table 2.2-1 on p. 2-6.

Table 4.2-6: MCOE EIS No Action Alternative Student Training Throughput

Type of Training	Student Numbers
Armor School*	
Total Student Input	7,638
Daily Average Load	840*
Infantry School	
Total Student Input	29,915
Daily Average Load	3,305
Infantry Training Brigade	
Total Student Input	19,256
Daily Average Load	5,008
Basic Combat Training Brigade	
Total Student Input	5,319
Daily Average Load	946
WHINSEC	
Total Student Input	450
Daily Average Load	97
MEDAC	
Average Load	30

Note: *Armor School average uses the same percent daily loading as the Infantry School.

To support the numerous training and operational missions, Fort Benning will offer the following by 2013:

- 52 basic marksmanship ranges (ranges used to qualify or train on rifles, pistols, sniper rifles, grenade launchers, sub-caliber light anti-armor weapons, shotguns, machine guns, and grenade machine guns); and
- 11 direct fire gunnery ranges (ranges used to qualify and train tank and Bradley crews, including ranges used to qualify anti-armor weapons systems using service ammunition).

Operations. Under the No Action Alternative, operations are nearly identical to that described for Baseline Conditions. The amounts, shown in Table 4.2-7, of small- and large-caliber weapons comprise the differences between the baseline and No Action Alternative conditions.

Table 4.2-7: MCOE EIS No Action Alternative Annual Weapons Use (Rounds Fired)

	Day	Night	Total
Small Caliber	35,800,000	3,540,000	39,340,000
Percent Day/Night	91%	9%	
Large Caliber	556,000	59,000	636,000
Percent Day/Night	87%	13%	

Source: USACHPPM 2008.

With the completion of the BRAC/Transformation actions in 2013 under the No Action Alternative, the vehicle inventory will be 1,035 vehicles as shown in Table 4.2-8.

Table 4.2-8: MCOE EIS No Action Alternative Armor School Vehicle Inventory

Vehicle	Type	Armor School
Tracked Armor Equipment	Tanks, Armored Personnel Carriers, BFVs, Recovery Vehicles, Tanks With Assault Bridges, And Mine Clearers	530
Wheeled Heavy Equipment	Stryker, HMMWVS (Carriers, Cargo, Armament, And Heavy Weight Trucks)	311
Wheeled Heavy Trucks	Heavy Cargo Equipment Transport, Fuel Tankers, Wrecker/Recovery Vehicles	37
Wheeled Trailers	Low-Bed Trailers For Armaments, Water, And Utility Towing	67
Wheeled Medium/Light Trucks	Fork Lifts, Cargo, And General Personnel Carriers	90
	Total Vehicles	**1,035**

Source: USACE 2007a.

Under the No Action Alternative, the missions would not conflict with those found under baseline, nor would there be any substantial changes (that have not been already addressed in the BRAC/ Transformation preferred Alternative B) to impact training operations at Fort Benning.

4.2.2.2 Alternative A (preferred alternative)

Under the preferred Alternative A, environmental protection and ITAM procedures under baseline conditions would continue so no impacts are anticipated for these facets of training operations and land management.

Mission. Under the preferred alternative, no changes to the missions would occur from that described under the No Action Alternative. Workforce numbers are not anticipated to change as well; however, it is anticipated that with the Growth initiative to increase Soldiers across the Army, there could be a similar percent increase in the number of Soldiers needing advanced training at the MCOE.

Training Assets. Under the Proposed Action, there will be changes to the range assets such as new ranges and additional range roads which are listed in Table 3.4-1. While the training assets under this alternative are related to the BRAC/Transformation actions, they are re-evaluated here. The timing, location, and/or size of the projects have changed to such an extent that they warranted further evaluation in this EIS.

Operations. There would be a slight increase in the number of operations due to the increase in student throughput. Table 4.2-9 presents these potential increases for both Alternatives A and B in comparison to the No Action. Under either action alternative, the number of rounds fired would be essentially the same. The number of vehicles expected under either alternative would be the same as the No Action Alternative; it is anticipated that the number of wheeled and tracked vehicles available under No Action would be sufficient to accommodate the increases in Soldiers under either action alternative.

Table 4.2-9: MCOE EIS Alternatives A and B Projected Annual Weapons Use (Rounds Fired)

	Day		Night		Total	
	No Action	***Projected Alternative A/B***	***No Action***	***Projected Alternative A/B***	***No Action***	***Projected Alternative A/B***
Small Caliber	35,800,000	37,800,000	3,540,000	3,700,000	39,430,000	41,500,000
Percent Day/Night	91%	91%	9%	9%		
Large Caliber	556,000	664,000	59,000	107,000	615,000	771,000
Percent Day/Night	87%	87%	13%	13%		

Source: USACHHPM 2009.

Alternative A would not introduce any new missions to conflict with those found under baseline or No Action, but substantial improvements to training capabilities would be provided at Fort Benning. Therefore, no impacts to training are anticipated under preferred Alternative A.

4.2.2.3 Alternative B

Under Alternative B, ITAM and environmental protection procedures would not change and therefore no impacts to training land management would occur. In terms of training, the weapons use numbers under Alternative B would not differ substantially from that found under Alternative A (see Table 4.2-9); however, the location, type, and number of ranges and maneuver assets would vary from Alternative A. Differences include two Multi-Purpose Machine Gun Ranges 1 and 2 (PNs 65070 and 68733), the MPTR north but separate from Hastings Range, and the Automated Combat Pistol Qualification Course (PN65079). In addition, Alternative B would not support the reduced impacts at the Vehicle Recovery Course (PN72017) in comparison to Alternative A. Major changes that have reduced impacts in Alternative A also do not occur in Alternative B's Southern Training Area Infrastructure (PN69743). Changes that have occurred under Alternative A to the Modified Record Fire Range 7 (MRF 7) (PN65049) and Firing Range 2 (Z 2) (PN65036) were not modified under Alternative B. The Armor 19D/K OSUT training would take place in TA-Q1, Q2, Q3, and Q5) (PN69741), south of U.S. Highway 27/280 for Alternative B. While this alternative is reasonable, the training taking place in these areas to the south would require an increased number of heavy tracked/wheeled vehicles needing to travel a longer distance to undertake this training than found under Alternative A. The result would separate OSUT training, spend more money on fuel, and take slightly more time to travel back and forth between OSUT training in the north and that in the south. The increased traffic across U.S. Highway 27/280 and along training roads and tank trails may also restrict the amount of training that currently exists in these TAs and potentially conflict with existing mission requirements. Operational and maintenance facilities would also lose their adjacency under this alternative and may constrain Armor training administration and management. Under this alternative, there would be moderate impacts to training operations and made manageable through scheduling and traffic restrictions.

4.3 LAND USE AND MANAGEMENT

Land use often refers to human modification of land for residential or economic purposes. The attributes of land use include general land use and ownership, special use land areas, and land management plans. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or to protect specially designated or environmentally sensitive uses.

Both in terms of the affected environment and potential environmental consequences, this assessment first focuses on non-range and training area land use and management within the boundaries of Fort Benning. A discussion of land use, ownership, and special use land areas for lands on the perimeter of Fort Benning follows. The geographic setting and location of Fort Benning provides the context for this land use assessment. Fort Benning covers 182,464 acres in portions of Muscogee, Chattahoochee, and Russell counties (personal communication, Markham, 2009). Approximately 80 percent of Chattahoochee County is within the boundaries of Fort Benning. The largest population center is the City of Columbus. The central business district of Columbus, GA lies approximately 8 miles north of the Main Post of the Installation. Columbus has the third largest population in Georgia and is the largest in land area (Columbus Consolidated Government 2006a). The City of Columbus and Muscogee County have a consolidated government (Columbus Consolidated Government, formed in 1971) and share the same jurisdictional boundaries (Columbus Consolidated Government 2006b). Phenix City, AL, the next largest incorporated city in the region, is located 9 miles northwest and across the Chattahoochee River from the Main Post area of Fort Benning. Phenix City shares close ties with the neighboring City of Columbus in terms of land use, as it is just west of the Chattahoochee River. The City of Cusseta, GA, the county seat of Chattahoochee County, is a small, incorporated city located south of Fort Benning. In 2003, the City of Cusseta and Chattahoochee County became the Unified Government of Cusseta-Chattahoochee County (Lower Chattahoochee Regional Development Center 2006). From 2005 to 2006, Chattahoochee County was the fastest growing county in the U.S. by percent increase in population (the county grew by 13.2 percent that year) (U.S. Census Bureau 2007). The remainder of the region is characterized by a few small, unincorporated communities and rural residences and predominantly agricultural and undeveloped vacant land used for farming and forestry. Other major urban areas within a 100 mile radius of Fort Benning include Albany and Macon, GA, and Montgomery and Dothan, AL.

The baseline conditions within the ROI for perimeter land use are found within a 3-mile zone of Fort Benning. This is consistent with the Army Compatible Use Buffer (ACUB) program, which is further detailed in Section 4.16. Because the area potentially affected by the Proposed Action and alternatives evaluated in this EIS are primarily within the Georgia portion of Fort Benning, the Alabama/Russell County land use is not analyzed in as much detail as are other areas adjacent to Fort Benning.

4.3.1 Affected Environment

4.3.1.1 Fort Benning

Lands that are not used for operational training at Fort Benning are used to support cantonment functions. Land use and management within the cantonment areas of Fort Benning is primarily in accordance with *AR 210-20, Real Property Master Planning for Army Installations*, dated May 16, 2005. The Real Property Master Plan (RPMP) for Fort Benning dates from 1994 (Harland Bartholomew and Associates 1994) and, while it provides a basis for orderly development of the Installation, the planning therein has largely been overcome by the events surrounding the unforeseen scale of development associated with the Transformation. The RMP places emphasis on: 1) eliminating or minimizing conflicts among incompatible functions; 2) improving the function efficiency of operations on the Installation; 3) improving the appearance of the Installation by buffering or relocating unattractive industrial, utility, or maintenance functions; and 4) improving the Installation environment by reducing motor vehicle use. Much of the planning in recent years has been charrette-style planning that draws from this foundation and is conducted in accordance with the guidelines of AR 210-20 and guided the development associated with various proposals. Fort Benning's annual planning board addresses ongoing Real Property Management Planning by considering and prioritizing projects for future years. Other management guidance included the Installation Design Guide (IDG), Integrated Cultural Resource Management Plan (ICRMP, November, 2007), Integrated Natural Resources Management Plan (INRMP), and aforementioned Range and Training Land Program (RTLP) Development Plan.

The Fort Benning IDG (U.S. Army undated) provides basic standards for the appearance of elements to be built or installed at Fort Benning within administration, community facilities, housing, industrial, open space, and mission support land use zones (see Section 4.4 for more detail on application of the Installation design guidelines at Fort Benning). The INRMP (Fort Benning 2001) is a component of the RPMP and serves as the decision document for natural resources management actions and compliance procedures. The ICRMP serves as the decision document for cultural resources management actions and compliance procedures. These documents guide land use by identifying potential conflicts between the Installation's mission and cultural and natural resources management. These guidance documents recommend compliance actions necessary to maintain the availability of mission-essential properties and acreage, and together develop a comprehensive plan for deliberately managing cultural and natural resources to attain and sustain stewardship requirements while optimizing primary activities on mission land and, where compatible, conducting secondary activities. Cultural resources management is discussed in more detail in Section 4.14. Land use components principally guided by the INRMP include timber management, outdoor recreation, habitat management, and management for the 15 Unique Ecological Areas (UEAs) identified in the INRMP. The biological resources management components of the INRMP, including the UEAs, are addressed in more detail in Section 4.13.

The Army has transferred ownership and responsibility of family housing to a private entity and issued a land lease on underlying Army land. This initiative is discussed in further detail in Section 4.15.2. Fort Benning's water, wastewater, gas, and electrical distribution systems have been privatized as part of the

Army's initiative to obtain safe, technologically current, and environmentally sound utility systems from private entities at a relatively lower cost than they would under continued government ownership. In the privatization process, military installations shift from the role of owner-operators to that of utility service customers. Tables 4.3-1, 4.3-2, and 4.3-3 provide a breakdown of baseline community support facilities, improvements, and housing at Fort Benning.

Table 4.3-1: Baseline Community Support Facilities

Type/Facility	Number	Type/Facility	Number
Morale, Welfare, and Recreation (MWR) Facilities[1]		***Army and Air Force Exchange Service (AAFES) Facilities***[1]	
After hours Community Activity Center	1	Main Post Exchange	1
Benning Conference Center (Former Officers' Club)	1	Barber Shops	7
Golf Course *(27 Holes)*	1	Beauty Shop – Main Post Exchange	1
Auto Skills Center	1	Shoppettes/5 with gas stations	12
Libraries (1 MWR; 2 Technical)	3	Theater (10-Plex)	1
Recreation Areas		Military Clothing Sales	2
(Destin, Florida and Uchee Creek, AL)	2	Troop Stores	2
Laundromat	1	Mini Mall	1
Gym/Fitness Centers	6	Class 6 Package Beverage Store	1
Recreation Centers	3	Car Wash	1
Outdoor Equip Checkout/Storage Units	1	AAFES Food Establishments	15
Car Washes	2		
Bowling Centers	2	***Commissary***[1]	1
Bingo Facility	1		
School Age Services	1	***Medical Facilities***[2]*:*	
Youth Services Center	1	Hospital	1
Child Care Centers	3	Emergency Room	1
MWR Food/Beverage Outlets	7	Troop Medical Clinics	4
Lodging Hotel	1	Primary Care Clinics	5
		Pharmacies	3
Other Facilities/Services[1]		Optical Fabrication Lab	1
Dependent Schools	7	Dental Clinic	5
Army Community Service Center	1	Veterinary Clinic	1
Chapels	7		

Source: [1]Personal communication, Osbourne 2009.
[2]Personal communication, Aut 2009.

Table 4.3-2: Baseline Assets

Improvement	Measurement
Buildings	
Number	2,981
Square Feet	21,013,625
Grounds	
Total Acres	182,464
Improved	11,035
Other	170,351
Roads (Miles)	
Paved	494
Gravel	696
Dirt	1,228
Tank Trails	40
Railroad Track	5
Utilities (not Army owned; privatized)	
Electrical Distribution (Miles)	590
Water	201
Gas	111
Sewer	167

Source: Fort Benning May 2006c.

Table 4.3-3: Baseline Military Housing

Type of Housing	Quantity
Married Personnel	
Available for Officers	675
Available for Enlisted	3,229
Bachelor Personnel (E6 and Above)	
Officer Quarters (in adequate condition)	0
Senior Enlisted Quarters (in adequate condition)	0
Enlisted Barracks (E5 and Below)	
Space Available: Trainees	19,054
Space Available: Permanent Party	3,365
Temporary Lodging Facilities	1,157

Source: Personal communication, R.A. Brown 2009.

Land use categories, defined in Army Technical Manual 5-803-1, *Installation Master Planning* (U.S. Army 1986), are summarized in Table 4.3-4. The distribution of these land use types is discussed for Fort Benning.

Table 4.3-4: Land Use Categories

Land Use	Definition
Administration	Headquarters and office buildings to accommodate offices, professional and technical activities, records, files and administrative supplies.
Airfield	Includes landing and takeoff areas, aircraft maintenance areas, airfield operations and training facilities, and navigational and traffic aids.
Community Facilities	Commercial and service facilities, the same as are associated with towns in the civilian community.
Family Housing	Facilities to house military families, along with support and recreational facilities
Industrial	Includes activities for manufacturing Army equipment and material, utility plants, and waste disposal facilities.
Maintenance	Facilities and shops for maintenance and repair of all types of Army equipment found at the depot, Installation, and manning and equipment levels.
Medical	Facilities providing for both inpatient and outpatient medical and dental care for active duty and retired personnel.
Open Space	Safety clearances, security areas, utility easements, water areas, wetlands, conservation areas, forest stands, and grazing areas.
Outdoor Recreation	Outdoor athletic and recreational facilities of all types and intensities of use.
Supply/Storage	Depot, terminal, and bulk-type storage for all classes of Army supply.
Training/Ranges	Academic training areas required to support entry level and continuing education, and fire and movement/maneuver areas.
Unaccompanied Personnel Housing	Unaccompanied enlisted and officer personnel barracks, including dining, administration, supply, outdoor recreation, and community retail and service facilities.

Source: U.S. Army 1986.

Main Post. Currently at 8,850 acres, Main Post is the largest and most developed of the cantonment areas. It includes the Post Headquarters, Infantry School, Cuartels barracks complex, Martin Army Community Hospital, Post Exchange, Commissary, and various family housing areas. Lawson AAF is located in the southernmost portion of the Main Post. The areas of the Main Post adjacent to the Chattahoochee River and Upatoi Creek are largely open space. Family housing and outdoor recreation dominate the northern portion of the Main Post. The densely developed core of the Main Post includes unaccompanied personnel housing, community facilities, training facilities, supply and storage, maintenance, industrial, and medical land uses. Implementation of the FY07 and FY08 projects from the BRAC/Transformation EIS (USACE 2007a) resulted in infill development and an overall improvement in land use compatibility, circulation, and efficiencies at the Main Post cantonment area. The improved efficiencies result from wider roads, improved roads, and overall infrastructure improvements.

Harmony Church. The Harmony Church cantonment area is approximately 775 acres and lies 5 miles east of Main Post along U.S. Highway 27. The existing Harmony Church cantonment area supports a diverse assortment of low density facilities including unaccompanied personnel housing, maintenance, training, administration, and outdoor recreation land uses. As a result of the implementation of the following FY07 and FY08 projects analyzed in the BRAC/Transformation EIS (USACE 2007a), a marked expansion of the Harmony Church cantonment area is underway:

- IET Brigade Headquarters Building (PN65056)
- Trainee Barracks Complex 1 (PN64370)
- Training Support Brigade Complex 3 (PN65862)

- Maneuver Center Simulation Facility (PN67648)
- Unit Maintenance Activity Facility (PN65251)
- 16th Calvary Regimental Headquarter Building Complex (Brigade, Battalion, and Company Operations Facilities) (PN65286)

Kelley Hill. The approximately 400-acre Kelley Hill cantonment area is located 3 miles east of Main Post. Current land use, which is fairly concentrated, includes unaccompanied personnel housing, community, and maintenance facilities. Unlike the Harmony Church cantonment area, the implementation of the FY07 and FY08 actions analyzed in the BRAC/Transformation EIS (USACE 2007a) had little effect on land use in this cantonment area.

Sand Hill. The approximately 2,510-acre Sand Hill cantonment area is located 4 miles northeast of Main Post. Land use in this cantonment area includes family housing, unaccompanied personnel housing, training, and community facilities. Some of the FY08 projects analyzed in the BRAC/Transformation EIS (USACE 2007a) within this cantonment area have changed and been slated for later implementation and are being reanalyzed in this EIS. Transportation and utilities infrastructure projects analyzed in the BRAC/Transformation EIS (USACE 2007a); however, improved the baseline land use functionality within this cantonment area.

***Recreation Areas*.** On-Post recreation areas are dispersed throughout the Installation. Most recreation and leisure programs on Fort Benning are managed and administered by the Directorate of Morale, Welfare, and Recreation (MWR). The operation and maintenance of those facilities and areas are the responsibility of MWR and the DPW. Fort Benning's undeveloped lands used for recreation, commonly called open space, may include golf courses, ball fields, or other similar recreation areas. Recreation areas adjacent to training areas include Uchee Creek Recreation Area, located off 101st Airborne Division Road at the junction of Uchee Creek and the Chattahoochee River in Alabama; Kings Pond recreation area, located off Hourglass Road; Twilight Pond, located off First Division Road at Dickman Field in Harmony Church area; and Weems Pond, located at Jamestown Road across from Warner Range. Use of these areas must be scheduled through Community Recreation Division, Directorate of Community Activities in accordance with USAIC Regulation 210-4. Other recreational opportunities, such as a pistol club range, bird-watching, fishing, hunting, and hiking, also occur on the Installation. Recreation within developed lands includes recreational and physical fitness facilities, child care programs, libraries, club activities, bowling, and other similar opportunities.

Fishing and recreational boating is permitted at largely undeveloped lands along the Chattahoochee River. There are fishing ponds throughout the Post that authorized personnel may use after acquiring a permit from Fort Benning and a fishing license from either Georgia Department of Natural Resources or Alabama Department of Conservation and Natural Resources (depending on which area of the Installation they fish). Issuance of the Fort Benning permit includes the acceptance by the permittee that ponds within training areas may be closed when the training areas are active. Before visiting any ponds, permittees must check if they are open for access.

Hunting on Fort Benning is regulated and coordinated with the schedule of field training exercise in the training compartments. As with fishing, a hunting license must be obtained from the state and a permit from Fort Benning. Permittees must check if access is allowed to any training compartment on any day before visiting. The areas open for hunting on a given day are determined by the amount of military training and land management activities occurring in the training compartments. No hunting of any kind is allowed on any range.

The Uchee Creek Recreation Area, located on the southwestern side of Fort Benning, is the most developed recreation site at the Post. The Uchee Creek Army Campground and Marina provide active duty and retired military personnel, DoD civilians, their families, and other eligible personnel with various recreational opportunities. Facilities include recreational vehicle (RV) sites, log cabins, boat launching ramp, boat slips, docking facilities (with gas, water, and electrical hookups), boat rentals, RV Rally site and Activity Center, archery range, basketball and volleyball courts, a softball field, picnic pavilions, playground equipment, and shuffleboard courts. Fort Benning has developed an Outdoor Recreation Plan to address administration and improvement of on-Post recreation resources to support the baseline population at Fort Benning (U.S. Army Installation Management Agency 2006).

4.3.1.2 Off-Post

Georgia Planning Requirements. Comprehensive planning is primarily conducted at the regional and local level, with the Georgia Department of Community Affairs monitoring State agencies and supervising local governments to ensure they conform to the State's long-term goals and objectives. In 1989, the Georgia General Assembly passed the Georgia Planning Act that established a coordinated planning program for the State of Georgia. This program provides local governments with opportunities to plan for their future and to improve communication with their neighboring governments. In addition, the Planning Act assigns local governments certain minimum responsibilities to maintain "Qualified Local Government" status and, thus, be eligible to receive certain state funding.

The cornerstone of the coordinated planning program is the preparation of a long-range comprehensive plan by each local government in the state. This plan is intended to highlight community goals and objectives as well as determine how the government proposes to achieve those goals and objectives. It is intended that the comprehensive plan be used to guide local government decision-making on a daily basis. "Qualified Local Governments" are required to have a comprehensive plan in conformity with the minimum standards and procedures; establish regulations consistent with its comprehensive plan and with the minimum standards and procedures; and participate in the Department of Community Affairs mediation process in a good faith effort to resolve any conflict. The Georgia Department of Community Affairs designates levels of analysis appropriate for the county comprehensive plans. For those within the ROI, the department requires an advanced level comprehensive plan for Muscogee County only; Harris County is required to prepare an intermediate level comprehensive plan; and the remaining counties in the ROI are required to complete a basic level comprehensive plan (personal communication, Henson 2008).

The State Advisory Committee on Rural Development advises the Board of Community Affairs on matters related to rural development and prepares a biennial rural economic development plan. Regional Development Centers are boards established by the Board of Community Affairs and can prepare studies of the region's resources as they affect existing and emerging problems of industry, commerce, transportation, population, housing, agriculture, public services, local governments, and any other matters relating to planning and development. They are also authorized to cooperate with local governments and planning agencies, required to develop a regional plan, and empowered to develop plans for counties and municipalities that request it. However, it is specifically provided that the provisions creating the Regional Development Centers do not impinge upon the zoning power of counties and municipalities.

In 2003, Title 36 of the Official Code of Georgia, relating to local government, was amended to require planning entities to investigate and make recommendations on proposed zoning decisions on land that is "adjacent to or within 3,000 ft of any military base or military Installation or within the 3,000-ft Clear Zone and Accident Prevention [*sic*] Zones Numbers I and II as prescribed in the definition of an Air Installation Compatible Use Zone of a military airport." Specifically, given the proposed land use's proximity to the military facility, planning entities are to determine the following:

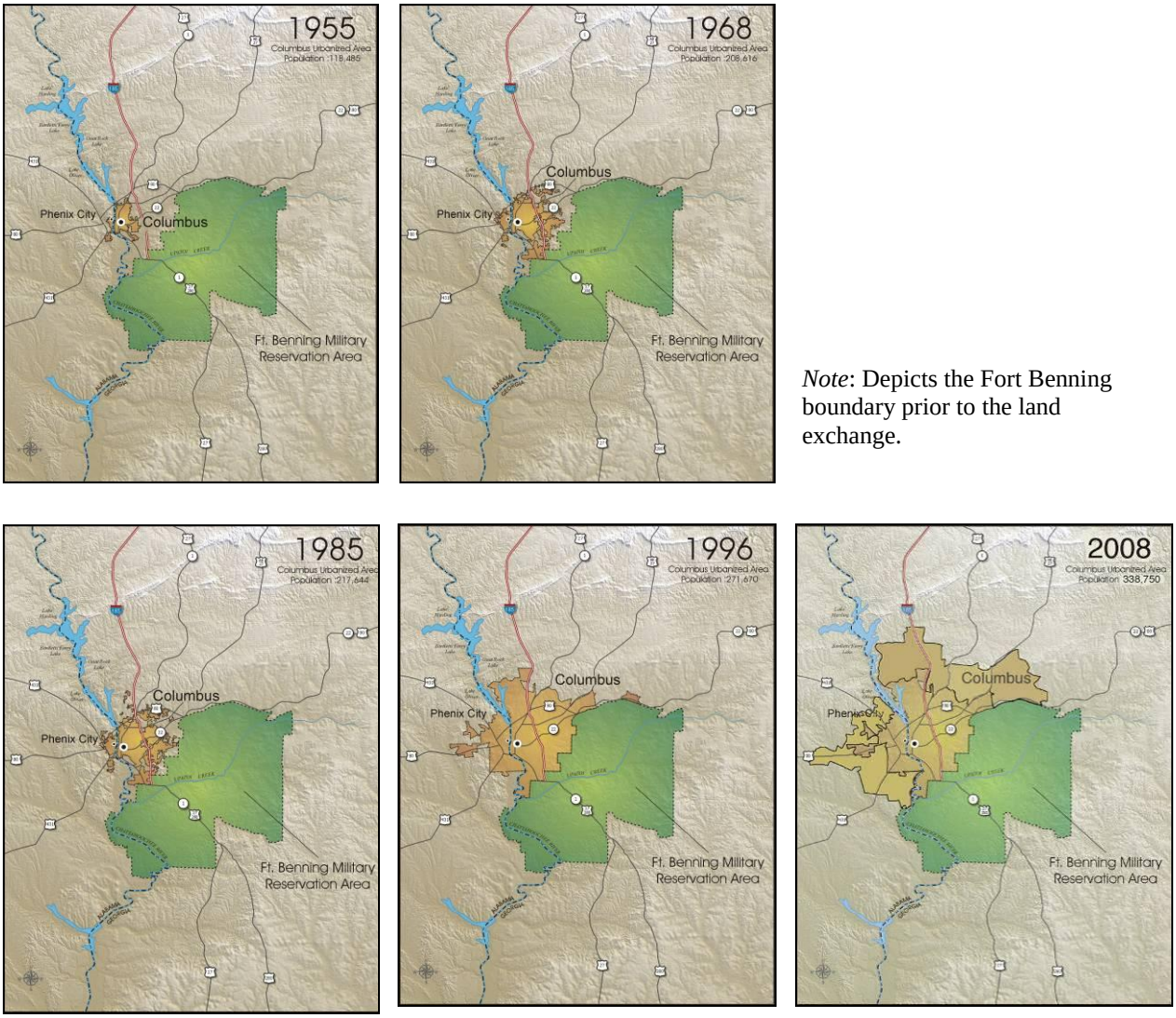
- if the proposal will permit a suitable use;
- if the proposal will adversely affect the existing use or usability of nearby property;
- if the affected property has a reasonable economic use as currently zoned;
- if the proposed use could cause safety issues to such items as streets, transportation facilities, utilities or schools;
- if a land use plan has been adopted and, if so, if the proposed change conforms with the policy and intent of the land use plan; and
- if there are existing or changing conditions that would affect the use of nearby property.

At least 30 days prior to the zoning hearing, the planning entity must request that the military commander provide "written recommendation and supporting facts relating to the proposed land use change." If the military commander does not submit a response by the date of the public hearing, then the proposed zoning change is presumed to not have an adverse effect. Any information received shall become part of the public record (Georgia Code 36-66-6).

Alabama Planning Requirements. Under Alabama state law, regional councils are mandated to "prepare a regional plan consistent with state comprehensive planning." In the mid-1960s, local governments were either required to have community and "area wide plans" to qualify for grants-in-aid; or were provided increased federal assistance if projects conformed to existing plans. This direct incentive for planning; however, no longer exists in Alabama (Alabama Association of Regional Councils 2002). Lee-Russell Council of Governments (LRCOG) serves as the regional planning and development organization that serves member governments by managing programs, promoting collaborative efforts, and serving as a clearinghouse for federal, state, and local funds (LRCOG 2006).

Increasing Urbanization within the ROI

In recent decades, there has been increasing urbanization of the Phenix City/Columbus area located to the northwest of Fort Benning. Whereas, in 1955, there was geographic separation between the urban landscape and the Post, urbanization expanded along the northwestern borders of the Post by the mid-1990s (Figure 4.3-1). Increasing urbanization adjacent to the north of the Post and southwestern portion of the Post is projected. This following series of graphics represent the historic urban growth of the Phenix City/Columbus area northwest of Fort Benning from 1955 through 1996 and projected growth through 2008. In 1955, the urbanized population was estimated at 118,485; by 2008, it is projected to be 338,750 (GAO 2003 and TNC 2006).



Note: Depicts the Fort Benning boundary prior to the land exchange.

Sources: GAO 2003 and TNC 2006.

4.3-1: Projected Regional Urbanization

Columbus Consolidated Government (Muscogee County and City of Columbus), GA

The City of Columbus and Muscogee County Planning Department is responsible for the following:

- preparing and updating the Comprehensive Plan;
- administering the subdivision regulations and reviewing site plans;
- preparing and recommending zoning ordinances to the City Council;
- administering the Georgia Greenspace Program for the City (to promote the permanent protection of at least 20 percent of the county's geographic area as greenspace);
- maintaining land use database; and
- providing technical support for city departments and agencies.

The *Muscogee County Comprehensive Plan, 1993-2013* (Columbus Consolidated Government 2003) as updated in 2003 (Columbus Consolidated Government 2003) is the current comprehensive plan for the Columbus Consolidated Government. The general land use and community development objectives are to guide future growth consistent with community objectives, encourage redevelopment of substandard and underutilized areas, and improve and protect existing development. The next update to the comprehensive plan was due to the Georgia Department of Community Affairs in October 2008 (personal communication, Cooper 2008). Figure 4.3-2 depicts the existing land use for Muscogee County per the Land Use Portion of the 2003 Comprehensive Plan. A total of 13 planning districts have been established, five of which border Fort Benning (from southwest to northeast): Districts 12, 13, 11, 3, and 4. Although Planning District 10, located between Districts 13 and 11, does not border Fort Benning it is within the 3-mile adjacency planning area. Land use within each of these districts is discussed in more detail below.

Planning District 12 is located along the Chattahoochee River and abuts the southwestern corner of the Installation with Victory Drive serving as its northeastern boundary. It is characterized by the predominance of public facilities associated with disposal of solid waste and wastewater. The city's former sanitary landfill is located in this area. Sand, gravel, and clay mining also occur in this area. Most of this planning district is dedicated to open space associated with the Chattahoochee River. The northern portion of the planning district includes some low-density residential land use west of Lumpkin Road. East of Lumpkin Road and along Victory Drive, land use is mixed and includes medium-density residential, high-density residential, commercial, and some industrial and public facilities. Plans for future development include encouragement for development of public institutions, such as the National Infantry Museum and the new marina, on South Lumpkin Road to tie in with the Oxbow Meadows Water Treatment site, the Oxbow Meadows Learning Center, and the Oxbow Meadows Golf Course. Like Planning Districts 10 and 13, this planning district is part of the Columbus South Redevelopment Area. The consolidated government has prepared more detailed planning for various redevelopment areas throughout the county. A primary objective in establishing this urban renewal area is to re-establish Columbus South as a viable commercial and residential area (Columbus Consolidated Government 2003).

Planning District 13 is a small district that extends eastward from Victory Drive to Cusseta Road. Land use in this area is primarily low-density residential, with some commercial development along Victory Drive. Commercial development in this area is attributed to services to the Fort Benning population. Parks include Lindsay Creek, Benning Hills, Calhoun Tract, and South Columbus.

Future plans for this area call for City review of all proposed development, rezoning, etc. for potential encroachment into the 3,000-ft area designated as an informal planning zone around the Installation. Like Planning Districts 10 and 12, Planning District 13 is part of the Columbus South Redevelopment Area.

Planning District 11 is a larger district that shares much of its southern boundary with Fort Benning. The predominant land use in this area is low-density residential. Residential land use is separated from other land uses that support major state and city public facilities by Schatulga Road. These include the Jack Rutledge Correctional Institute, the Columbus Diversion Center, West Georgia Regional Hospital, offices and storage facilities of the Georgia Department of Transportation, Columbus Correctional Camp, the Metro Animal Shelter, and the city's sanitary landfill. East Columbus (Corporate Ridge) Industrial Park, with tenants that include the expanding Aflac insurance company, is located in the northeastern portion of this district. A segment of I-185 forms the western boundary of this district. The interchanges at Buena Vista and St. Mary's Roads provide east-west access to Fort Benning and other major employment centers and commercial land uses are located along these routes. Bull Creek forms the northern boundary of this area. Parks include Shirley Winston, Carver, Belvedere, and Primus King. As is the case with Planning Districts 4 and 13, future planning for this area includes review of all proposed development, rezoning, etc. for potential encroachment into the 3,000-ft planning zone and discourages residential development from the zone if the developments are deemed too close to the firing ranges. A portion of Planning District 12 was part of a land exchange with Fort Benning, wherein the Army transferred land in this "North Tract" to the consolidated government of Columbus/Muscogee County for the "South Tract" located in Chattahoochee County. The North Tract now supports economic and development uses for Columbus/Muscogee County and the South Tract now supports military training uses (U.S. Army 1999).

Planning District 3 is a larger planning district that extends to the northward extent of the County, but shares only a portion of its southern boundary with Fort Benning. Garrett Road forms the eastern boundary of the district and Macon and/or Chattsworth roads form the southern boundary of the district. Existing land use includes low-density residential, rural residential, industrial, and park/open space associated with Flat Rock Park, John Rigdon Park, and Bull Creek Golf Course. The land use plan for this area includes providing for long-range industrial, commercial, and various types of residential uses and support for light or heavy industrial development in the areas between Macon Road and the Fort Benning boundary.

Planning District 4 is a large planning district that includes lands north of Fort Benning to the Harris County line. This area commonly referred to as the panhandle, remains largely undeveloped. Garrett Road serves as the western boundary of this planning zone and the Talbot County line serves as its eastern

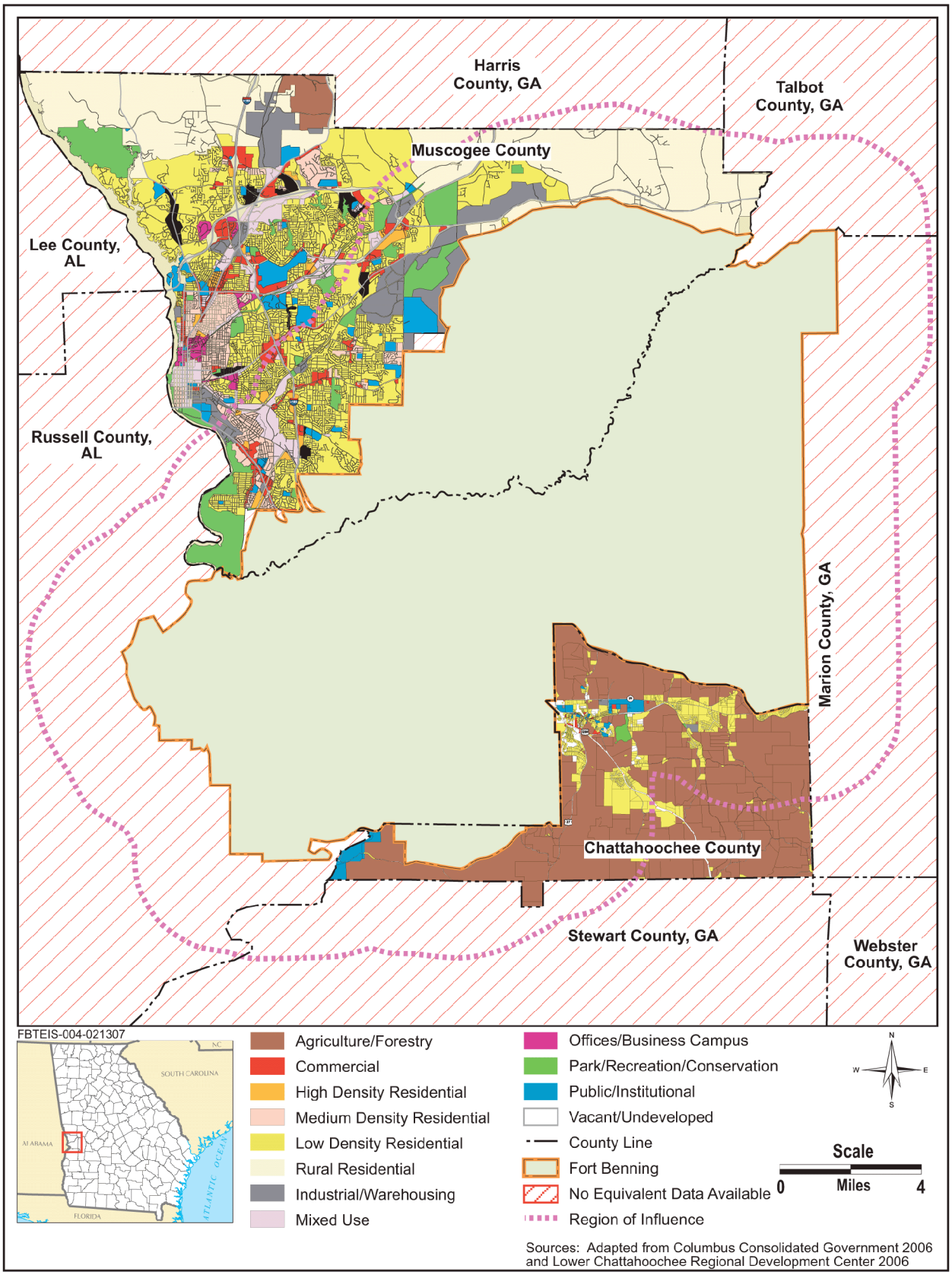


Figure 4.3-2: Region of Influence for Land Use in Muscogee and Chattahoochee Counties

boundary. Land use in this planning district is rural residential with the exception of the western portion, which includes some industrial (Pratt and Whitney), low-density residential, and a small park located north of U.S. Highway 80/Macon Road. Growth in this area is expected along this highway as a result of increasing urbanization associated with Columbus. The Miller Tract, east of Pratt-Whitney, has been identified as a potential area for expansion of industrial land uses. The Land Use Plan recommends that the city review all proposed development, rezoning, etc. in this district for potential encroachment into the 3,000-ft planning zone. Proposed residential development should be discouraged from the zone if the developments are deemed too close to the firing ranges.

Planning District 10 is a relatively small, wedge-shaped planning district that is bound by the Central Railroad, Bull Creek, and Cusseta Road on the west and I-185 on the east. Land use is a mix between low, medium and high-density residential and mixed commercial-industrial. Industrial development along the railroad lines is the predominant land use factor. The Columbus South Redevelopment Area is located in this planning zone. A primary objective in establishing this urban renewal area was to re-establish Columbus South as a viable commercial and residential area.

Chattahoochee County, GA

Chattahoochee County is dominated by Fort Benning lands; the approximately 20 percent of the county that is not included within the Installation is located southeast of Fort Benning. The *Comprehensive Plan for the Unified Government of Cusseta-Chattahoochee County 2008-2030* (The Lower Chattahoochee Regional Development Center, 2008) is the current comprehensive plan for the unified government of Cusseta – Chattahoochee County. The vast majority (84 percent) of the land use in the county and most lands adjacent to Fort Benning are characterized as agriculture/forestry. Approximately 12 percent of the county land use is low-density and rural residential land use occurs primarily within the City of Cusseta and along State Route 26 and U.S. Highway 27/280. Single-family detached housing is the predominant residential land use and manufactured housing is the second most frequently used housing type. Public/institutional land uses account for about 2 percent of all land uses and are located in close proximity to the Cusseta Town Center. Commercial and industrial land uses occur in association with the Cusseta Town Center (Lower Chattahoochee Regional Development Center 2008). The comprehensive plan's vision for parks/ recreation and conservation is to protect state and federal natural resource areas as well as local parks, conservation areas, wetlands, and streams. The county strives to protect agricultural areas and promote an agriculturally based economy while encouraging limited residential development. The county seeks to maintain the rural residential areas and undeveloped land by encouraging large lot sizes and open spaces. Fort Benning Commercial areas are to be designed for Fort Benning business related activity, with consideration given to smoke and noise generation due to base activities. Additionally any commercial activity must meet low lighting requirements in order to avoid disturbing night time exercises at Fort Benning. The county plans on conserving and maintaining green space to buffer Fort related activities from public activities. The plan also includes the adoption of a green space buffering policy to be applied to the area around Fort Benning (Lower Chattahoochee Regional Development Center 2008).

Marion County, GA

Marion County is located on the eastern boundary of Fort Benning. No major communities are located in this county adjacent to the Installation. The land uses adjacent to the Installation are primarily rural agricultural areas. Marion County completed the community's first comprehensive plan in September 1995. The plan was scheduled to undergo a full update in October 2006; however, revisions to the state-mandated Standards and Procedures for Local Comprehensive Planning took effect in May of 2005. To alleviate the work load of developing a new planning document in a relatively short period, one year, a Partial Update component was added to the planning standards. The Partial Update of the Marion County comprehensive plan was accepted in September 2007, and meets the Georgia Department of Community Affairs planning standards. The county is scheduled to complete a new comprehensive plan under Georgia Planning Act standards by October 2010 (personal communication, Mixon 2008). Figure 4.3-3 provides a general overview of the land use cover in Marion County and surrounding counties.

Talbot County, GA

Talbot County is located on the northeastern boundary of Fort Benning and does not include any major communities in the area adjacent to the Post. The land uses adjacent to the Installation are primarily rural agricultural areas. Talbot County prepared a comprehensive plan in 2005, prior to the Department of Community Affairs adoption of new local planning requirements. The next full plan update is due in 2015 and a partial update is required in 2010 to address the updates to the local planning requirements (personal communication, Johnson 2008).

Harris County, GA

This county is located to the north of Fort Benning and north of Muscogee County/City of Columbus. The county boundary is 2 miles north of the Installation boundary at its closest proximity. Land use in the southern portion of this county is primarily undeveloped with some rural residential and agriculture and forestry uses. Harris County implemented a Comprehensive Plan in May of 1999 and the next update is scheduled for December of 2009. A partial update was scheduled for 2007, but a statewide extension nullified the update (personal communication, Gray 2008). Areas of concentrated and diversified land use are associated with the communities of Hamilton, Pine Mountain, Waverly Hall, Fortson, and West Point (Joint Harris County, City of Pine Mountain, City of Shiloh, City of Waverly Hall Comprehensive Planning Commission 1992).

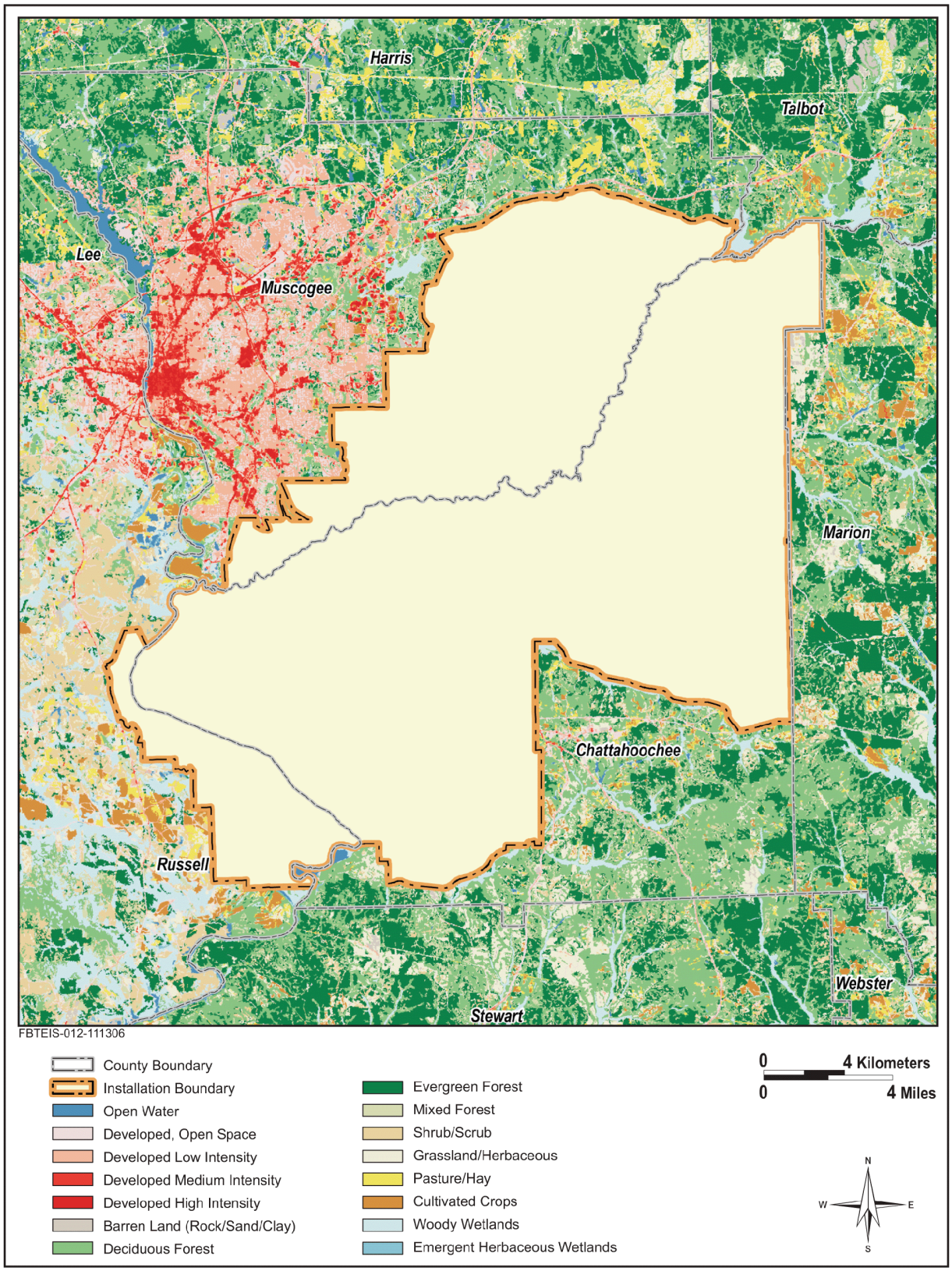


Figure 4.3-3: Existing Land Use Cover Data for Counties in the Vicinity of Fort Benning

Russell County, AL

There is no comprehensive plan for Russell County, Alabama. Land use zoning has only been established for the Phenix City area of this county (personal communication, Smith 2008). Land uses adjacent to Fort Benning are characterized as rural agricultural.

Fort Benning Army Compatible Use Buffer and Joint Land Use Study Programs

Under Fort Benning's Army ACUB program, Fort Benning has partnered with The Nature Conservancy (TNC) and other stakeholders to pursue a combination of conservation easements and fee acquisitions in the areas surrounding Fort Benning to achieve the complementary goals of limiting disruptions to training capabilities or flexibility, while protecting key environmental resources. Since FY06, nearly 2,000 acres near Fort Benning has been acquired or placed in conservation easement under the ACUB program. The program is expected to continue to expand, particularly given potential synergies related to the trend of timber companies divesting of timberlands in the area (personal communication, Harrison 2008). This program is described in more detail in the cumulative impacts analysis, Section 4.16.

A Joint Land Use Study (JLUS) was completed for Fort Benning in May 2008 through a partnership consisting of Columbus-Muscogee, Cusseta-Chattahoochee, Harris, Marion, Russell, Stewart, and Talbot Counties; City of Phenix; Middle Flint and Lower Chattahoochee Regional Development Centers; Lee-Russell County of Governments; and Fort Benning (The Valley Partnership 2008). The purpose of the JLUS is to ensure that the military mission can continue without degrading the public health, safety, and welfare of surrounding communities; sustain economic development without hindering national military readiness; identify regulatory and non-regulatory actions to ensure future land use compatibility between local governments and military installation; continue to foster increased communication between Fort Benning and surrounding local governments and communities; and to ensure that the economy remains strong and the Army is able to continue its mission efficiently and effectively.

The JLUS identified the following six areas of concern for land use compatibility (due to noise and smoke) based on a combination of existing land use, zoning, future land use, and current development patterns:

- East Columbus-Muscogee adjacent to the Fort Benning boundary;
- The Columbus-Muscogee panhandle;
- Box Springs community in south Talbot County;
- Northwestern Marion County adjacent to the Fort Benning boundary;
- Cusseta Community; and
- an area referred to as the Lawson AAF Influence Area.

This JLUS provides a number of options for minimizing land use conflicts between Fort Benning and the surrounding communities. All of the entities participating in the JLUS, including the Army and each local government, retain the prerogative of adopting any of the tools (The Valley Partnership 2008). Therefore, the JLUS is further evaluated in the cumulative impacts analysis, Section 4.16.

4.3.2 Environmental Consequences

Impacts on land use would be considered significant if one or more of the following occurs within the ROI for any of the action alternatives:

- the action is incompatible with surrounding land use; or
- the action changes land use in such a way that mission-essential training is degraded; or
- the action is inconsistent or in conflict with the environmental goals, objectives, or guidelines of a community or county comprehensive plan for the affected area.

It should be noted that, while mentioned below, potential noise-related impacts both on-Post and off-Post are addressed in detail in Chapter 4.8.

4.3.2.1 No Action Alternative

Consequences to on- and off-Post land uses would continue to occur as described in the BRAC/Transformation EIS (USACE 2007a). No significant impacts would occur on- or off-Post; however, some areas will have increased potential for incompatibilities such as noise-related impacts associated with the BOLC III Heavy maneuver training noted below. While the cantonment areas would expand, some infill and infrastructure development would be expected to improve land use functions and the overall land use pattern would continue to separate incompatible functions. Off-Post, there would be indirect impacts of increased urbanization related to the increased personnel stationed at Fort Benning under the actions analyzed in the BRAC/Transformation EIS. There would also be the potential for increased incompatibilities in the Chattahoochee-Cusseta area due to the establishment of the Good Hope Maneuver Area. For example, BOLC III Heavy maneuver training is required to occur during the hours of 0400 hours (4:00 am) to 2400 hours (midnight) for half of the training days and 0600 (6:00 am) to 2400 hours (midnight) for the remainder of the training days. The community would be informed regarding the training schedule through a website that is currently under construction and will be available to the general public in the late summer of 2009. The PAO will continue to notify the public of noise associated with training activities through public notices issued to the local media outlets and local governments.

As further discussed in the cumulative impacts analysis (Section 4.16), completion and adoption of recommendations provided in the JLUS and ACUB, including working with local jurisdictions to implement land use controls, would continue to minimize inconsistencies and/or conflicts with adjacent land uses.

4.3.2.2 Alternative A (preferred alternative)

Fort Benning

The planning process that was used to select sites of proposed facilities and associated land uses under Alternative A was consistent with AR 210-20, *Real Property Master Planning for Army Installations*, and Technical Manual, TM 5-803-1, *Installation Master Planning*. GIS and charrette-style planning were used extensively in this process. Multi-disciplinary input was obtained from the ultimate users of proposed facilities, DPW, Environmental Division, range management, and Garrison command staff. Among the factors considered when siting proposed facilities were compatibility with existing and proposed adjacent land uses, natural resource constraints and compatibility with the INRMP, cultural resource constraints, transportation and circulation, compliance with regulated environmental requirements (e.g., air quality, hazardous materials, water resources), and architectural/aesthetic compatibility. Therefore, cantonment area development associated with implementation of Alternative A would be compatible with surrounding land use and would enhance rather than degrade mission-essential training. Other changes to land use within the cantonment area would occur and are described below.

Harmony Church. The greatest change in land use would occur at the Harmony Church and Sand Hill cantonment areas. Implementation of Alternative A would result in continued expansion of the Harmony Church cantonment area from the baseline condition. For the most part, the types of land uses proposed for the Harmony Church cantonment area would be consistent with the existing use of this area, with the addition of community facilities (physical fitness center, recreation center, and Troop Store) in the form of infill development. In addition, Alternative A includes the construction of access control facilities and infrastructure into the Harmony Church cantonment area that would be required for orderly vehicular access and circulation throughout the expanded cantonment area. The proposed Vehicle Recovery Course, which would be used to train soldiers on how to retrieve tracked vehicles when mired or overturned, would be somewhat inconsistent with community facilities in the area, but this is balanced with the synergies provided by co-location with vehicle maintenance facilities also occurring in Harmony Church. While the Vehicle Recovery Course, DS/GS Vehicle Maintenance Facility and Shop 1 Facility, and Troop Store are FY09 projects, the remainder are FY12 projects.

Sand Hill. The proposed development within the Sand Hill cantonment area would provide for additional unaccompanied personnel housing, classroom training, and community facilities consistent with baseline land uses. Associated infrastructure support projects would address transportation utilities infrastructure requirements. Most of the Alternative A projects are slated for FY10.

Main Post. Within the Main Post cantonment area, Alternative A includes development for various uses, including medical, administrative, unaccompanied personnel housing, community facilities, and operational facilities. Major projects (affecting the greatest land area) are the hospital replacement project and the water treatment plant upgrade and expansion. In addition, there would be a dental clinic addition (at the Bernheim Site in the southeastern portion of the Main Post), a Warrior in Transition Complex, three unit maintenance facilities, a dining facility, and associated infrastructure improvements that would

be required for adequate service to the cantonment area. The land use configuration at the Main Post with the development included under Alternative A would be more concentrated, and would provide for overall improvements in land use compatibility, circulation, and efficiencies. Essentially, the facilities proposed for construction in the Main Post are similar from a land use perspective and would simply involve a more intense use of compatible land uses. The Main Post projects are slated from FY09 or FY10 implementation. The increased noise Zone III occurrences along Dixie Road (near Red Cloud Range) cause incompatible land uses with some Residential Community Initiative (RCI) family housing in the Boutin Heights and Davis Hills areas (see Section 4.8, Noise for further information regarding noise impacts). Fort Benning is working with RCI program personnel to determine the appropriate mitigation for these occurrences which will be addressed in later NEPA documentation.

Outdoor Recreation. An increase in recreation demand is anticipated with the arrival of additional personnel at Fort Benning. Alternative A incorporates recreational considerations into the land use development plans for the cantonment areas. A Recreational Center and Physical Fitness Center are both proposed for the Harmony Church cantonment in FY 2012. As previously noted, Fort Benning has developed an Outdoor Recreation Plan to address improvements to provide for additional opportunities (U.S. Army Installation Management Agency 2006). Access to lands for hunting and fishing, which is always subject to availability, would be expected to become more limited as range land use and operational use expands under Alternative A. In addition to the on-Post recreation opportunities, ample opportunities for recreation lie beyond the boundaries of the Post within the area immediately surrounding Fort Benning and the region.

Off-Post

Pursuant to the Biological Opinion for this action, the Army will mitigate impacts to the RCW from the Scout Leaders Course field training, a MCOE-related heavy mechanized training course, by moving it out of the Southern Maneuver Training Area to area(s) yet to be determined outside of the Installation's boundaries. This relocation would occur within 5 years of the beginning of training on the Scout Leaders Course. This training relocation would be subject to additional, future NEPA documentation.

Under Alternative A, changes in land use adjacent to Fort Benning would occur as a result of the secondary impacts of induced growth. Such changes would not be inconsistent or in conflict with the environmental goals, objectives, or guidelines of the existing comprehensive plans. In fact, the communities surrounding Fort Benning have been planning for the anticipated growth that would be driven by the BRAC/Transformation action and Fort Benning is working closely with these communities in the planning processes. In terms of land use, it is anticipated that primary changes would result from increased demand for residential land use and commercial and public services.

The ongoing development in the Oscar Range Complex with seven small arm ranges included in Alternative A would contribute to incompatibilities with existing rural residential land use along Chattsworth Road/Columbus-Muscogee panhandle area. The establishment of the Northern maneuver corridor could increase concern for potential incompatibilities in the Columbus-Muscogee District 11

area. Incompatibility issues include air quality (dust and smoke) and potential noise impact issues associated with range operations. The Columbus-Muscogee comprehensive plan addresses the potential for such conflict and includes provisions for review of all proposed development, rezoning, etc. for potential encroachment into the state-mandated 3,000-ft planning zone and states that proposed residential development should be discouraged from the planning zone if the developments are deemed too close to the firing ranges (Columbus Consolidated Government 2003). The proposed development, therefore, in the Oscar Range Complex would not conflict with the goals, objectives, or guidelines of the comprehensive plan.

Army Growth would continue to result in indirect impacts in the form of increasing urbanization surrounding Fort Benning. The community comprehensive plans adjacent to Fort Benning include strategies to address this growth and this indirect impact would not be in conflict with these plans.

As with the No Action Alternative, Alternative A may increase encroachment pressures on the Installation. The JLUS initiatives, noise management planning, and cooperative efforts with the community could reduce the likelihood that encroachment would occur if the recommendations provided in these plans were adopted by the communities; therefore, lessening the opportunity for mission-essential training to be degraded. Fort Benning would continue to work with counties and communities surrounding the Installation as they plan for future growth and in the development and implementation of a JLUS.

4.3.2.3 Alternative B

The types of land use impacts associated with Alternative B are similar to Alternative A. Alternative B would disturb approximately 24,595 acres of land while Alternative A would disturb approximately 10, 045 acres of land. The project differences for Alternative B in the ranges and training areas include establishment of 19D/K OSUT in TA-Q1, Q2, Q3, and Q5 (south of U.S. Highway 27/280) (PN69741) and two Multi-Purpose Machine Gun Ranges (PNs 68733 and 65070) in the training area south of U.S. Highway 27/280. An Automatic Combat Pistol Qualifications Course (PN65079) would be constructed under Alternative B. In Alternative B, the MPTR would be built north of Hastings Range rather than on Hasting Range, as in Alternative A. Other differences between Alternative B and Alternative A are that the major changes that have occurred in Alternative A to reduce impacts for the Vehicle Recovery Course (PN72017) do not occur in Alternative B. Major changes to reduce impacts in Alternative A in the Southern Training Area Infrastructure (PN69743) also do not occur in Alternative B. Modifications that have occurred in the Modified Record Fire (MRF 7) (PN65049) and Firing Range 2 (Z 2) (PN65036) do not occur in Alternative B. Consequently, there would be significant impacts to land use with Alternative B similar to Alternative A.

4.3.3 MITIGATION MEASURES

Under all alternatives, there would be continued implementation of existing noise management and compatible land use programs (further detailed in Section 4.16), which would lessen impacts. The mitigation for the potential land use incompatibilities that could result from the establishment of the Good Hope Maneuver Area would be the same as those established in the BRAC/Transformation EIS (as this project was first analyzed in the BRAC/Transformation EIS and is reanalyzed in this EIS). Heavy maneuver training would occur as noted above in 4.3.2.1. To minimize these impacts, the public will be notified of the training schedule through a website under construction and should be available for access by the end of the summer of 2009.

4.4 AESTHETICS AND VISUAL RESOURCES

4.4.1 Affected Environment

Fort Benning can trace its aesthetic roots back to the 1929 design and layout by George B. Ford. His vision for Fort Benning incorporated elements of the City Beautiful Movement, which included a balance of open space and developed space, tree lined avenues with generous setbacks, and aesthetically consistent architecture. He also separated land uses by clustering administrative, training, and recreation areas away from the residential areas and warehouses on the periphery of the Installation (Kane & Keeton). While Ford's intentional separation of land uses, and deliberate planning of open space made for a pleasant aesthetic in the 1930s, in the years that followed Fort Benning's role in the U.S. military evolved. As a result, the rapid growth and expansion at the Installation had little opportunity to incorporate the principles of the City Beautiful Movement or other of Ford's intentions. Instead, the building types and materials reflect this growth and the need to accommodate utility in buildings rather than aesthetics.

Today, there is no single image to represent Fort Benning nor can it be characterized by a unified architectural character or style. The Installation's cantonment areas are divided into three distinct visual districts within the Installation Design Guidelines for Fort Benning, Georgia. These visual districts do not completely coincide with the four main cantonment areas (Figure 4.4-1). Instead, they are grouped according to common architectural characteristics, building styles, landscaping, and building materials. These three separate districts are the Main Post Visual District, Historic Visual District, and Sand Hill Visual District (Fort Benning nd.).

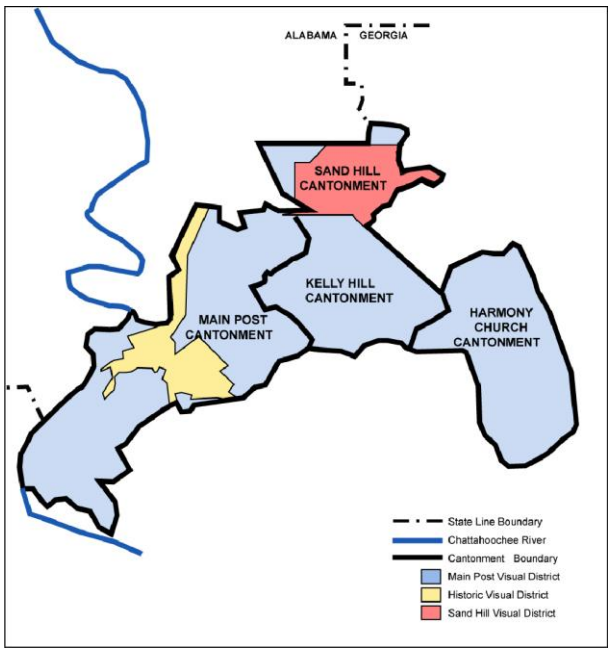


Figure 4.4-1: Fort Benning Visual Districts and Cantonment Areas

Main Post Visual District. The Main Post Visual District is the largest district with the most diverse characteristics and includes the Kelley Hill and Harmony Church areas, residential land use areas, and outlying areas such as Camps Darby and Merrill, and Lawson Army Airfield (AAF). The residential communities within this district include McGraw Manor, Custer Terrace, Upatoi Terrace, Battle Park Homes, and Bouton Heights and are characterized by a distinct identity, consistent building materials (white stucco with red clay tile roofs), and uniform setbacks. Kelley Hill and Harmony Church exhibit more diverse characteristics and a range of building materials and styles. The former is characterized by a series of masonry barracks while the latter is characterized by pre-fabricated wood frame buildings. Lawson AAF is characterized by a series of pre-fabricated hangar structures, storage, and maintenance facilities.

Sand Hill Visual District. The Sand Hill Visual District is the basic training area that houses the Infantry Training Brigade and Basic Combat Training Brigade. Of the three districts, this area is characterized by the most consistent architectural characteristics. The barracks buildings are almost identical three-story concrete structures with red brick columns and detailing with low sloped roofs. The other facilities in the Sand Hill District are one to two story red brick structures.

Historic Visual District. The Historic Visual District is not synonymous with the Main Post Historic District, though many structures and buildings belong to both Districts. The Historic Visual District is characterized by the prevalence of buildings with stucco exteriors, limestone details, and red clay tile roofs and distinctive architectural characteristics such as columns, pilasters, friezes, and arcades. The Historic Visual District and associated viewsheds are addressed in the Cultural Resources section.

4.4.2 Environmental Consequences

Impacts for aesthetics and visual resources are considered to be significant if one or more of the following criteria is met.

- Changes at the site, including changes to form, line, color, and/or texture substantially degrade an existing viewshed or alter the character of a viewshed by the introduction of anomalous structures or elements.
- Changes at the site would result in changes in the expectations of viewers (measured against the relative importance of those views) and result in a negative impression of the viewshed. The emphasis of this criterion is on views from public view areas.

4.4.2.1 No Action Alternative

Changes to the visual environment from the implementation of the No Action Alternative would not result in a significant impact to aesthetics and visual resources. Impacts to the visual environment, consistent with a military installation, which would occur at various sites are discussed below.

Main Post Cantonment Area

The selected sites for facilities and infrastructure improvements for the No Action Alternative occur at dispersed locations throughout the Main Post.

Conversion of UPH Billeting Space to Transient UPH, Infantry Basic Officers Course Headquarters Complex, Student Dining Facility, and General Instruction Building Complex (PN65322). Conversion of the Cuartels Buildings would not be anticipated to significantly change the aesthetic viewshed. The functionality of the buildings would be changed, but the landscape would remain largely unaltered. Aesthetic changes to the buildings themselves would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings. An increase in vehicle traffic accessing these facilities would be likely to occur but would not adversely impact the viewshed or aesthetic values.

Armor Climate Control Storage Facility (PN65061). Construction of the proposed Storage Facility would not change the visual character of the site since it would be built alongside the newly opened Infantry Museum. The viewers' sensitivity to this construction would not be likely.

Brigade Headquarters Building/CIDC Facility (PN65578) and MCOE Headquarters Expansion and CDI (PN65284). These expansion and new construction projects for on the Main Post would modify the viewshed. The buildings and expansion, however, would be constructed near existing buildings and would not be significant since it is in keeping with the surrounding military facilities. Aesthetic changes due to new facility construction would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings. Increased volumes of traffic would be anticipated on the road network used to access and egress these facilities.

Medical Clinic Expansion (PN65081). Expansion of the Medical Clinic would not be anticipated to change the overall aesthetic viewshed. The functionality of the buildings would remain the same. Aesthetic changes to the buildings themselves would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings. An increase in vehicle traffic accessing these facilities would be likely to occur but would not adversely impact the viewshed or aesthetic values.

Hospital Replacement (PN67461) and Warrior in Transition Complex (PN69999). Construction of the Hospital and Complex would change the aesthetic viewshed in that the current hospital would be replaced with a larger hospital facility on the same site as the existing hospital and expand the developed area to accommodate the Transition Complex. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings. An increase in vehicle traffic accessing these facilities would be likely to occur but would not adversely impact the viewshed or aesthetic values.

SOF Complex (PN65395). Construction of the proposed SOF complex would change the visual character of the site from a forested setting to the north and west and residential setting to the east to a more urbanized setting with new structures and elements that would have long-term impacts to the existing viewsheds. The viewers' sensitivity to this visual change would not be notable, because this development is consistent with surrounding buildings and land uses. Traffic volumes in the near vicinity of the proposed buildings would not be changed from existing conditions.

Barracks Complex (PN38134). Construction of the proposed barracks would not change the visual character of the site. The viewers' sensitivity to this visual change would be noticeable but would not be adverse because it would be consistent with adjacent military facilities. Traffic volumes in the near vicinity of the proposed buildings would not significantly change from existing conditions.

Harmony Church Cantonment Area

The No Action Alternative would not result in significant impacts to aesthetics and visual resources to the Harmony Church cantonment area. The current area is sparsely developed and the introduction of any dense development would likely change the expectations of viewers; however, it is not anticipated that the new viewshed would leave a negative impression. Although the character of a viewshed would be altered by the introduction of new structures, they would not necessarily be inconsistent with the area, since the current site lacks a density of structures with which to conflict. In addition, this area has historically been developed and would introduce no new aesthetic values that have not been apparent in the past. This would help to establish a visual presence and consistency to a currently semi-developed area.

Building Conversion for 3 ID Brigade Combat Team (BCT) (PN63799). Conversion for 3 ID BCT would not be anticipated to cause a notable change to the aesthetic viewshed. The functionality of the buildings would be changed, but the landscape would remain largely unaltered. Aesthetic changes to the buildings themselves would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings. An increase in vehicle traffic accessing these facilities would be likely to occur but would not adversely impact the viewshed or aesthetic values.

Central Wash Facility (PN48644.) A central wash facility to support the Armor School training at Fort Benning will consist of wash lanes to include pump houses, water recycle system and distribution system, heavy vehicle baths, vehicle final wash area, vehicle staging area hardstand, grit and oil chambers, filter area including service roadway, detention pond, concrete tank trail road to facility, and tactical vehicle hardstand. Supporting facilities will include: night and security lighting; water, sanitary and industrial waste systems; POV parking, sidewalks, storm drainage system; fencing; signage; dumpster pad and enclosures. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Armor Officer Basic Course Headquarters (PN65286). This project converts existing Historic Buildings 71, 67, 69 and 15 to battalion and company headquarters (two companies) including administrative space and general instructional space. Supporting facilities include, but are not limited to: water, sewer, and natural gas services, POV parking, security lighting, fire protection, storm sewer system, sidewalks, landscaping, and signage. Aesthetic changes to the buildings themselves would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Vehicle Maintenance Instruction Facility (PN65438). This project involves construction of a vehicle maintenance instructional and general instruction building to include a concrete apron and tactical vehicle hardstand. Supporting facilities include security lighting; storm sewer system and detention structure; and sidewalks; landscaping; fencing; and signage. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Community Activity Center (PN65246). This project involves construction of a 40,000 square foot recreation center on Harmony Church. This facility will include an auditorium with seating capacity for 1,000; stage, stage lighting, projection room; 4 storage rooms; 3 movie rooms with seating for 30 in each room and other recreational activities. Parking will accommodate 400 spaces. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Physical Fitness Center (PN65248). This project involves the construction of a 64,800 square foot standard design physical fitness center including gymnasium, racquetball court, outdoor swimming pool, exercise facilities, administrative facilities, classroom, and storage areas. Supporting facilities include paving, walks, outdoor recreation areas, signage, dumpster enclosures, landscaping, protection of historic landscape features are required. Anti-terrorism/force protection measures will include exterior lighting. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Army Reserve Center, Operations and Maintenance Services, and Unheated Storage (PN64491), Equipment Concentration Site (PN65405). Construction of the proposed projects would change the visual character of the area but would not be significant due to its consistency with the surrounding military facilities.

Rail Loading Facility Expansion (PN62953). This project will involve the construction a total of 26,328 linear feet of rail car storage track ballast, and cross ties, (6 new rail spurs) adjacent to the State of Georgia Department of Transportation (GADOT) Right of Way railroad that lies within the Fort Benning

Military Reservation and south of the area known as "Ochillee Junction". This project will also involve the construction of a crossover track, ballast, and cross ties and switching system between the Norfolk Southern Railroad Company railroad line and these storage tracks; construction of a switch track consisting of three spurs adjacent to the Norfolk-Southern railroad; construction of a temporary construction access road and rail crossing; and construction of a transit loading shed and a blocking/operations building. At the existing Ochillee Railhead, the project will widen the existing concrete tank trail for additional vehicle staging/parking space. Railroad crossing warning signal systems (with flashing lights and gate assemblies) are to be constructed at primary road crossings. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Battle Command Training Center (PN64790). This project involves the construction of a: Battle Command Training building, Access Control Point (PN65439), Tactical Operations Center (TOC) Pads, and communication/antennae structure. Support facilities include: site development and improvements, utility extensions, parking for tactical and non-tactical vehicles, access road, storm drainage, and security systems. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Chapel (PN65065). This project involves the construction of a standard-design Army chapel (400-seat capacity). Supporting facilities include: exterior lighting; covered front and rear entrance drop-off and pickup areas; sidewalks; new parking and refurbishment of existing parking spaces; retaining walls; and site improvements. Anti-terrorism/force protection standards will be incorporated into the planning, programming, design, and construction of this project. These measures include resistance to progressive collapse, laminated glass on all windows, canalizing berms, decorative retaining walls, and establishment of no parking areas along adjacent streets. Access for the handicapped will be provided. While aesthetic values in the area would change, the impacts would be minimized by adhering to the Installation Design Guide and any cultural resource management requirements that mandate new construction maintain the consistency of materials, colors, and styles of adjacent buildings.

Sand Hill Cantonment Area

Maneuver Center Reception Station Barracks (PN51256). Construction of the proposed barracks would change the visual character of the site from an undeveloped vegetated area to a more urbanized setting with new structures and elements that would have negative impacts to the existing forested viewsheds. The viewers' sensitivity to this visual change would be noticeable but would not be adverse because they would be consistent with adjacent military facilities. Traffic volumes in the near vicinity of the proposed buildings would not change significantly from existing conditions.

Chapel (PN65249). Construction of the proposed Chapel and infrastructure support would change the visual character of the site from a forested setting to a more urbanized setting. The viewers' sensitivity to this visual change would not be notable because it is consistent with adjacent facilities. Traffic volumes in the near vicinity of the proposed buildings would not change significantly from existing conditions.

Basewide Proposed Projects

Various Road and Infrastructure Improvements (PN67457). Improvements to infrastructure including roadway upgrades are anticipated to have minor long-term aesthetic impacts. Improvements to existing infrastructure would be anticipated to increase the prominence of these elements within an area that is dense forest. Traffic would increase but would not significantly impact the viewshed or aesthetic values.

Range Areas

The proposed development of range facilities, driver training areas, and heavy maneuver areas under Alternative A would change the visual character of some training areas by increasing land disturbance and introducing range facilities. Refer to Table 3.4-3 for a listing of these multiple projects. Viewers' sensitivities to changes in form, line, color, and/or texture are not a consideration within a training range area. Such sensitivities also are not a concern with regard to adjacent cantonment areas because such changes would not be inconsistent with viewer expectations. Views from north of the Oscar Ranges would be buffered from the public by enough distance that there would not be a negative impression created.

4.4.2.2 Alternative A (preferred alternative)

Main Post Cantonment Area

The greatest potential for significant aesthetic and visual resource impacts is associated with development that is proposed within the Main Post Historic District. Any construction within the Main Post Historic District would require compliance with Fort Benning's ICRMP and HPC to ensure that the visual integrity of the District is not degraded (see Section 4.14 for more information). This would include the Water Treatment Plant Upgrade and Expansion (refer to Table 3.4-1 and Figure 3.4-1 Main Cantonment Area for PNs and project proposed locations). The site is located on the northern edge of the historic district and stretches east to west along the north edge of 10th Division Road on either side of Fort Benning Boulevard. Since the site is on the northern edge of the Historic Visual District and surrounded by forested area, no significant impacts to existing viewsheds are anticipated. In addition, although the proposed design has not been determined, if the new building is consistent with the materials, style, color, and articulation of surrounding buildings, it would not degrade long term visual resources. However, there would be temporary negative impacts to visual resources in the cantonment area localized near the construction site.

Elsewhere within the Main Post cantonment area within the Main Post Visual District, the Hospital Replacement Project would be infill development and located to the eastern edge of the Main Post cantonment area, outside the viewshed of the Historic Visual District and surrounded by forested area.

Hospital Replacement (PN70235). This proposed project, which includes former BRAC/Transformation projects PN67461 and PN65081 (combined due to the decision to replace the existing hospital), is located at the east edge of the cantonment in the Main Post Visual District. The site is located at the undeveloped interchange between Marne Road and Lindsey Creek Parkway (Route 411). The development that surrounds the project site consists of large commercial and industrial buildings to the northwest and southeast of the interchange. There are low residential buildings along the south eastern edge of the site. The remaining area around the intersection is surrounded by heavily forested area.

Dining Facility to Support AST Training (PN69151). The proposed site is located between Marchant Street., Benjamin Street, and Riordan Street immediately to the west of the parachute jump towers. The site is currently occupied by eight barracks that are not historic and ineligible for the Historic Register. The site is surrounded to the north and west with low density development such as parking lots and small support structures. There are additional barracks located to the south. To the east, across Riordan Street is the Parachute Jump Towers, a historic open area within the Historic Visual District.

Dental Clinic Addition (PN71620). The site is located in the southwest corner of the cantonment at the northwest corner of the intersection of Way Street and Sightseeing Road. The Auto Skills building currently occupies the project site. The area is surrounded by low density single story development and maintenance structures and forested area to the north.

Maneuver Battle Lab (PN65250). The site is located in the southwest corner of the cantonment to the south of the one mile track and immediately to the east of the Audie Murphy Gymnasium, and to the north of Way Street and west of Dixie Road. The existing area is occupied by several small structures to the south, along Way Street at Dixie Road. The site is surrounded by forested area to the north, open field to the east, and development to the south.

Warrior in Transition Complex (PN69999). The project site is located on the west side of the new hospital. The site is currently undeveloped and is wooded to the north and west with Marne Road to the south.

None of these structures would be located adjacent to historic resources or within a historical viewshed. While the Installation should ensure that new construction would be aesthetically harmonious through the use of appropriate architectural design characteristics and landscape planning, no significant impacts to visual resources are expected as a result of implementing Alternative A.

Harmony Church Cantonment Area

The proposed development within the Harmony Church cantonment area is within the Main Post Visual District in an area along U.S. Highway 27/280. The existing facilities in this area are mixed architecturally and include semi-permanent barracks, vehicle maintenance/motor pool facilities, administrative facilities, and various recreational fields. Much of the area is currently undeveloped and supports dense forest stands.

DS/GS Vehicle Maintenance Facility (PN64460). This facility provides a base-operations vehicle maintenance facility for Fort Benning's support of all assigned units. The Maintenance Division, Directorate of Facilities Engineering and Logistics is assigned the mission of providing maintenance of Army equipment in support of assigned tenant units, activities, and organizations at Fort Benning.

Shop 1 Maintenance Facility (Component of General Instruction Complex Project) (PN65322). This facility provides a base-operations vehicle maintenance facility for Fort Benning's support of all assigned units.

Physical Fitness Center (PN65248), Rail Loading Facility Expansion (PN62953), and Troop Store (PN71065). These projects are located in a sparsely developed area, straddling U.S. Highway 27/280 that is surrounded on all sides by heavily forested area.

Community Activity Center (PN65246). This project supports community activities for various functions; it is centrally located and close to nearby barracks.

The proposed construction in Harmony Church would remove numerous mature trees within the natural landscape, to be replaced by new structures and elements. This would have long-term impacts to the existing viewsheds. However, these new projects would not necessarily significantly impact the corridor viewshed. Although the design of the new structures is undetermined at this time, the proposed projects could create a new visual district that could create a visually consistent and coherent image currently lacking within the majority of this cantonment area.

Sand Hill Cantonment Area

The proposed projects located within the Sand Hill cantonment area are also located within the Sand Hill Visual District, which is characterized by the most consistent architectural characteristics. The projects include: Trainee Complex Upgrade (PN69147), Classrooms & Dual Battalion Dining Facilities (PN69150), Training Barracks Complex (PN69745), and Classrooms with Battalion Dining Facilities (PNs 70026 and 70027), Blood Donor Center (PN64481), Training Barracks Complex, Phase 1 (PN72322), Training Barracks Complex, Phase 2 (PN72324), Training Dining and Classroom Facilities, Phase 2 (PN72456), Training Dining and Classroom Facilities, Phase 2 (PN72457), Chapel (PN65249).

As was mentioned above, these projects are proposed for construction within the central portion of the Sand Hill Visual District, to the north and south of 11th Airborne Division Road, between 3rd Infantry Division Road to the west and Moye Road to the east. This area is located in a densely developed area on parcels presently occupied by buildings. While the design for the proposed projects is undetermined at this time, no significant impacts are anticipated if the new designs conform to the consistency of the existing, one to three story concrete structures with red brick columns and detailing within the visual district.

Basewide Proposed Projects. Infrastructure Support, Increment 2 (PN67457), Construct Training Access Road, Paved (PN65554), and Repair Existing Training Area Roads (PN65557) are proposed northwest of the Sand Hill cantonment and in the vicinity of old Cusseta Road.

Range Areas

There are no significant impacts anticipated for Proposed Actions in the heavy maneuver corridors or range project areas (refer to Table 3.4-1 and Figure 3.4-3). The proposed construction of these projects would require the removal of the numerous mature trees within the natural landscape that would be replaced by new structures and landscape elements that would have long-term impacts to the existing viewsheds. These new projects, however, would not necessarily adversely affect the corridor viewshed.

4.4.2.3 Alternative B

Except for the Unit Maintenance Facilities (PN69406), only proposed under Alternative B, visual and aesthetic impacts would be similar to those found under Alternatives A. No significant impacts are anticipated within the various cantonment areas if Alternative B were implemented. Please refer to Table 3.4-2 and Figures 3.4-2 and 3.4-4 for project comparison and locations.

Ranges and Training Areas North and South of U.S. Highway 27/280

These areas are sparsely developed, heavily forested, and occupied by few structures. The construction of the proposed action would require the removal of the numerous mature trees within the natural landscape that would be replaced by new structures and landscape elements that would have long-term impacts to the existing viewsheds. These new projects, however, would not necessarily adversely affect the corridor viewshed.

4.4.3 Mitigation Summary

Visual compatibility within the cantonment areas of new structures would be maintained through design, by ensuring the new facilities are consistent with the form, line, color, and texture of adjacent manmade and natural features. Viewsheds pertaining to ranges and training areas would remain consistent with the historic training that has occurred at Fort Benning for over 40 years.

4.5 SOCIOECONOMICS

4.5.1 Affected Environment

The socioeconomic Region of Influence (ROI) for Fort Benning consists of Muscogee, Chattahoochee, Harris and Marion Counties, Georgia, and Russell County, Alabama. The socioeconomic ROI constitutes the area where the predominant socioeconomic effects of the Proposed Action and alternatives would take place. The geographical extent of this ROI is based on residential distribution of the Installation's military, civilian, and contracting personnel and the location of businesses that provide goods and services to the Installation and its employees. The baseline year for the socioeconomic analysis is 2007, although much of the economic and demographic data for the ROI are available only through the year 2006 or 2000. Wherever possible, the most recent data available is presented so that the affected environment descriptions are reflective of current conditions in the ROI.

4.5.1.1 Economic Development

Regional Economic Activity

During the last 8 years, the ROI unemployment rate has increased from a low of 4.7 percent in 2000 (USBLS 2007b). The ROI labor force in 2007 totaled 128,685, with 122,021 employed (USBLS 2007a). In 2007, the unemployment rate for the ROI averaged 5.2 percent, compared to 4.4 percent for the state of Georgia, 3.5 percent for the state of Alabama, and the national unemployment rate of 4.6 percent. Private businesses are the major source of employment in the ROI. Private sector employment generated approximately 74.7 percent of the ROI's jobs in 2006. In Muscogee County, the largest in population of the five ROI counties, private sector employment accounted for 81.5 percent of the total jobs (USBEA 2006). In Muscogee County, retail and trade and health care and social assistance are the two largest of the 20 major sectors. Information and management of companies sectors constitute only a small percentage of the total sectors in the ROI (USBEA 2006). In the State of Georgia, government and government enterprises is the largest of the 20 major sectors followed by retail trade (USBEA 2006).

The ROI per capita personal income (PCPI) for Chattahoochee County was $26,502 in 2006, 72.2 percent of the national PCPI and lower than the state of Georgia's PCPI of $32, 095. Muscogee County's 2006 PCPI was $33,409 and Marion County's was $26,790. Russell County, Alabama had a PCPI of $25,112 (USBEA 2006). The highest per capita personal income in the ROI was in Harris County ($37,664) at 102.6 percent of the nation's (USBEA 2006).

Installation Contribution to the Local Economy

The most recent data indicate that Fort Benning employs a total of 26,461 (excluding students): 17,771 military personnel; 3,307 civilian employees; and 5,383 contract workers. The Installation workforce accounts for about 34 percent of all ROI employment which presents a substantial economic contribution to the local economy. Installation expenditures in the ROI totaled $2,266,490,543 during 2005 (USACE 2007a). Payroll expenditures, which reached $1,054,214,521 in 2005, have increased by almost 29

percent since 2000. The average annual salary for civilian workers at Fort Benning is $29,377 and salaries for permanent military personnel at Fort Benning averaged $24,378 in 2005 (USACE 2007a).

4.5.1.2 Demographics

The five counties comprising the economic ROI are primarily rural in character. Demographic and economic trends over the last three decades have contributed to a growing disparity in population and income levels among the five counties. With a population of 187,046, Muscogee County is the most heavily populated county in the ROI. Growth rates for the five counties have diverged greatly over the past three decades. The population of Chattahoochee County has actually decreased by 56.6 percent since 1980, falling from 21,732 to 9,430 (Stats Indiana 2007). In contrast, Harris County has experienced 88.0 percent population growth over this period, far above the national growth rate of 33.1 percent. The smallest of the counties, Marion County, has grown 32.6 percent during that time. Muscogee and Russell counties have experienced modest growth at 10.0 percent and 6.0 percent respectively. Population data for ROI counties and the United States are also provided in Table 4.5-1 for comparison purposes.

Table 4.5-1: ROI Population Growth 1980 -2007

County	1980	1990	2000	2007
Russell County, AL	47,356	46,860	49,756	50,183
Chattahoochee County, GA	21,732	16,934	14,882	9,430
Harris County, GA	15,464	17,788	23,695	29,073
Marion County, GA	5,297	5,590	7,144	7,024
Muscogee County, GA	170,108	179,280	186,291	187,046
Total ROI	259,957	266,452	281,768	282,756
U.S. Total	226,545,805	248,709,873	281,421,906	301,621,157

Source: Stats Indiana 2007a.

4.5.1.3 Housing

The ROI housing stock is summarized in Table 4.5-2, which identifies both owner-occupied and renter-occupied homes, along with median home values, for each county in the ROI. The housing units identified in Table 4.5-2 include all structure types (e.g., single-family homes, apartments, and mobile homes).

Table 4.5-2: Housing Characteristics for the ROI*

Type	Russell	Chattahoochee	Harris	Marion	Muscogee
Total Housing Units	22,831	3,316	10,288	3,130	76,182
Occupied Housing Units	19,741	2,932	8,822	2,668	69,819
Owner-occupied	12,341	793	7,600	2,084	39,350
Renter-occupied	7,400	2,139	1,222	584	30,469
Vacant Housing Units	3,090	384	1,466	462	6,363
Vacant for Seasonal, Recreational, or Occasional Use	295	6	907	145	362
Median Home Value (Owner-occupied)	155,118	107,855	254,783	151,250	280,799

Source: U.S. Census Bureau 2000a.
Note: * The 2000 census data are most recent data available.

As with other economic indicators, the five counties have very different housing markets. The estimated median values of owner-occupied units in Chattahoochee, Marion, and Russell counties are substantially lower than the current estimated nationwide median home value of $222,000. Muscogee and Harris Counties, however, support home values of more than 25 percent above the national median. In 2005, it was estimated that the total number of housing units in Chattahoochee and Marion counties barely increased. However, Muscogee increased its housing units from 76,182 to 81,008. Russell and Harris County housing markets are estimated to have increased by approximately 2,000 units each. Within the ROI, there are many programs to aid the homeless including approximately nine shelters (USACE 2007a). Military housing is addressed in the Quality of Life Section.

4.5.1.4 Quality of Life

Quality of life refers to those amenities which are available to the Installation's military personnel, their family members, and civilian employees and which contribute to their well being. The relative importance of these amenities to a person's well-being is subjective (e.g., some individuals consider educational opportunities essential to their well-being, others may place a high value on the availability of medical services, and still others may hold public safety as their primary quality of life concern). Quality of life analyses typically address issues relating to potential impacts of the Proposed Action and alternatives on the availability of public services and leisure activities that contribute to quality of life of the affected Installation's workforce and their family members. For purposes of this study, the affected environment (i.e., elements or factors) for quality of life includes military housing, schools for DoD family members, family support services, medical facilities, shops and services, and recreational opportunities.

Military Housing

Approximately 25 percent of military personnel reside on Fort Benning. In 2005, there were more than 30,000 housing units on Fort Benning. Table 4.5-3 shows the categories of military housing at Fort Benning, including barracks housing for unaccompanied personnel.

Table 4.5-3: Distribution of Fort Benning Housing by Type

Housing Type	Number of Units
Officer (married) Family Units	685
Enlisted (married) Units	3,361
Officer (bachelor) quarters	108
Senior Enlisted (bachelor) quarters	26
Trainee Barracks	25,190
Temporary Lodging	1,157

Source: USACE 2007a.

Medical Facilities

The U.S. Army Medical Department Activity provides medical care to an eligible patient population in excess of 72,000 beneficiaries out of the 103-bed Martin Army Community Hospital (MACH). The facility is served by approximately 792 civilian and 546 military staff members.

On average, the hospital provides inpatient care to more than 30 patients daily, and averages nearly 1,500 outpatient visits a day. In addition, there is an outpatient pharmacy that processes more than 2,200 prescriptions per day. Additional medical facilities are located in Soldiers' Plaza including the Community Mental Health Service, the Social Work Service, and the Preventive Medicine Service. Marion Memorial Hospital (Marion County), Stewart-Webster Hospital, Columbus Doctors Hospital, The Medical Center (Chattahoochee-Cusseta), Cobb Memorial Hospital (Russell County), Bush Hospital, Doctors Hospital, Muscogee County Health Center, Saint Francis Hospital, and West Central Georgia Regional Hospital (Muscogee County) all provide medical services within the ROI (Fort Benning 2007a).

Educational Services for DoD Dependents

For educational services off-Post, the U.S. Department of Education provides federal impact aid to school districts that have federal lands within their jurisdiction. This federal impact aid is authorized under Public Law 103-282 as payment in lieu of taxes that would have been paid if the land were not held by the federal government. School districts receive federal impact aid for each federally connected student whose parent or parents live on or work on federal property. The amount of federal impact aid a school receives is based on the number of "federal" students the district supports in relation to the total district student population. Schools receive more federal impact aid for those students whose parents both live and work on federal property. Total federal impact aid varies year by year according to congressional appropriations for the program, but in general federal impact aid has ranged from $250 to $2,000 per student. Fort Benning has seven DoD schools on the Installation (6 elementary and 1 middle); high school students residing on the Installation (grades 9-12) attend local county high schools (Fort Benning 2007a). ROI schools are highlighted in Table 4.5-4 below.

Table 4.5-4: 2003-2004 School Year Public Education Statistics

School District or County	School Type	Enrollment	Total District Enrollment	Enrollment Capacity
Chattahoochee	Elementary (1)	341	707	Space Available
Chattahoochee	Middle (1)	157		Overcrowded
Chattahoochee	High (1)	209		Overcrowded
Harris	Elementary (4)	2,162	4,724	Space Available
Harris	Middle (1)	1,141		At Capacity
Harris	High (1)	1,421		At Capacity
Harris	Other (1)	N/A		N/A
Marion	Elementary (1)	642	1,657	Space Available
Marion	Middle (1)	484		At Capacity
Marion	High (1)	531		At Capacity
Muscogee	Elementary (32)	15,828	33,502	Space Available
Muscogee	Middle (12)	7,967		Overcrowded
Muscogee	High (10)	9,707		Space Available

Table 4.5-4: 2003-2004 School Year Public Education Statistics

School District or County	School Type	Enrollment	Total District Enrollment	Enrollment Capacity
Muscogee	Other (8)	N/A		N/A
Russell	Elementary (11)	4,224	11,549 (For Russell County and Phenix City districts)	Space Available
Russell	Middle (3)	2,355		Space Available
Russell	High (2)	2,502		Space Available
Russell	Other (2)	N/A		N/A
TOTAL	**94**	**49,671**	**52,139**	

Source: USACE 2007a.

Family Support Services

Fort Benning has several family support service facilities on-Post. The Installation has a day care center that operates 5 days a week and can provide care for up to 140 children between the ages of 2 and 5. Family counseling services are also available to active military personnel and their family members (USACE 2007a).

Shops and Services

On the Main Post, AAFES operates a Post Exchange with numerous stores as well as a new 10-screen theater. The newly renovated commissary, one of the largest facilities on Fort Benning, sells a variety of goods to authorized patrons, and contains a bank, fresh produce, a bakery, a sushi bar, and a hot foods section. Fort Benning mall also serves the area and its employees. In May 2005, there was a groundbreaking ceremony for a new mall in Fort Benning that opened in November 2007. The Installation also has several gasoline stations including one located at the Post Exchange. Off-Post, there are numerous gas stations as well as shopping malls, including an outlet mall (USACE 2007a).

Recreation

Fort Benning offers numerous recreational opportunities on-Post. The Installation has two bowling alleys and three 9-hole golf courses. It also has a recreational shooting range where military personnel can practice targeting which simulates combat conditions. Outdoor activities are numerous. There are swimming pools, natural ponds, biking trails, and designated hunter and fishing areas as well as facilities to rent equipment for outdoor sports. Off-Post, the usual recreational opportunities for military personnel and their families are found and include restaurants, retail stores, and entertainment venues. In Columbus, for example, the Historic District has a number of activities and attractions of cultural interest like the Springer Opera House and the Columbus Museum (USACE 2007a).

Public Services

Law Enforcement. On-Post, the Provost Marshall provides law enforcement services. Off-Post in Georgia, the Columbus Police Department has a total of 388 sworn officers providing law enforcement in the City. In Muscogee County, there are over 350 sworn officers providing protection; the Cusseta Police Department has 8 sworn officers providing law enforcement in the county; Chattahoochee County has two sworn officers; and in Harris County, 43 sworn officers operate in five districts. In Alabama, the

Phenix City Police Department supports 86 sworn officers and Russell County's Sheriff's Office Patrol Division consists of four squads (USACE 2007a).

Fire Protection. On-Post, Fort Benning's Fire Department provides protection. Off-Post in Georgia, numerous fire districts serve the ROI, including 14 stations with a total of 368 full-time sworn positions in the City of Columbus, 15 volunteer fire personnel in the Cusseta County Fire Department which serves Cusseta and Chattahoochee Counties. In Muscogee County, 5 volunteer fire stations provide services county-wide (excluding Columbus) and in Harris County 11 volunteer fire departments provide protective services. Within Alabama, 3 fire stations provide protection in Phenix City and in Russell County there are 6 volunteer fire departments. Each volunteer fire or rescue district recruits its own volunteers from community members surrounding a particular station. As the demographics of the population have changed over time, it has become increasingly difficult to attract community members to serve as volunteers (USACE 2007a).

4.5.1.5 Environmental Justice

On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. The EO is designed to focus the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities. Environmental justice analyses are performed to identify potential disproportionately high and adverse impacts from Proposed Actions on minority and low income communities, and to identify alternatives that might mitigate these impacts. Data from the U.S Department of Commerce 2000 Census of Population and Housing were used for this environmental justice analysis. Minority populations included in the census are identified as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, Hispanic, of two or more races, and other. Poverty status, used in this EIS to define low-income status, is reported as the number of persons with income below poverty level. The 2000 Census defines the poverty level as annual income of $8,794, or less for an individual, and annual income of $17,603, or less, for a family of four.

To determine where such populations reside, census data for block groups were used. Table 4.5-5 presents these population numbers. The ROI has a higher percentage of minority residents than both the state of Georgia and the state of Alabama. In 2006, 54.5 percent of the ROI population was white and 41.6 percent was black. All other racial groups combined totaled approximately 4.2 percent of the population, while 3.7 percent were of Hispanic origin. In Georgia, 65.8 percent of the population was white, 29.9 percent was black, 4.3 percent was of another minority racial group, and 7.5 percent was of Hispanic origin. In Alabama, 71.2 percent of the population was white, 26.3 percent was black, 2.5 percent was Hispanic, and approximately 1.8 percent was of another racial minority (USACE 2007a). Figure 4.5-1 illustrates the location of the census blocks in relation to Installation boundaries.

Table 4.5-5: Race, Ethnicity and Poverty Status by 2000 Census Block[1]

	9081-2, Marion County	*101.2-1, Muscogee County*	*106.4-3 Muscogee County*	*107.1-1 Muscogee County*	*Marion*	*Muscogee*	*State of Georgia*	*ROI*
Total Persons	2,024	2,046	6,515	4,283	7,144	186,291	8,186,453	281,768
Black or African American	8.3%	10.9%	79.0%	75.0%	34.0%	42.9%	28.7%	40.2%
American Indian or Alaskan Native	0%	0.4%	1.0%	0%	0.6%	0.5%	0.3%	0.4%
Asian	0%	3.1%	0.5%	1.1%	0.3%	1.6%	2.1%	1.2%
Native Hawaiian/other Pacific islander	0%	0%	0%	0%	0%	0.2%	0.1%	0.1%
Hispanic or Latino	3.2%	2.1%	5.5%	4.9%	6.0%	4.5%	5.3%	4.0%
Percent Living Below Poverty Level	21.7%	1.6%	9.3%	9.9%	22.4%	15.7%	13.0%	15.8%

Source: U.S. Census 2000a, 2000b, and USACE 2007a.

4.5.1.6 Protection of Children

On April 21, 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was issued. This EO directs each federal agency to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. EO 13045 recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns make them more susceptible to accidents because they are less able to protect themselves. For example, elevated blood lead levels in children are associated with development impairments, including reductions in IQ. Young children in particular are at higher risks for exposure to lead based paint and lead contaminated soils because of their behavioral traits. Therefore, to the extent

[1] The census block groups included in this analysis are those that fall within the expected noise effects. These groups are defined by expected noise contours and are used to provide the most detailed analysis of the possible environmental justice effects stemming from the Proposed Action.

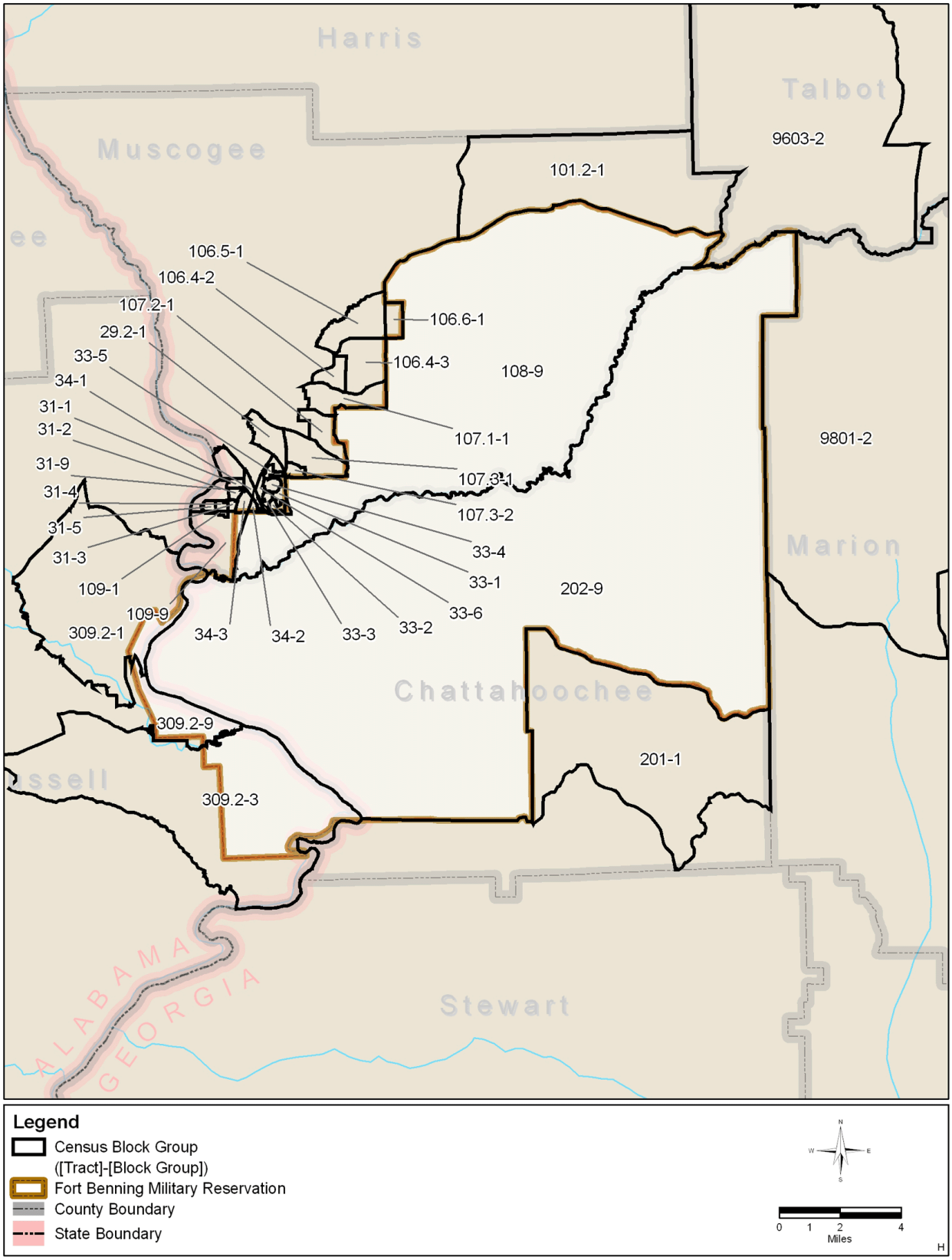


Figure 4.5-1: Census Blocks Adjacent to Fort Benning

permitted by law and regulations, and consistent with the agency's mission, President Clinton directed each federal agency to 1) make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children, and 2) ensure that the agency's policies, programs, and standards address disproportionate health risks to children that result from environmental health risks or safety risks. Examples of risks to children include increased traffic volumes and industrial or production-oriented activities that would generate substances or pollutants children may come into contact with or ingest. Actions or alternatives indicating potential disproportionate risks to children will be identified and addressed in the Environmental Consequences Section of this EIS.

4.5.2 Environmental Consequences

Economic Impact Forecast System (EIFS) Model Methodology and Threshold

The economic effects of implementing the Proposed Action are estimated using the EIFS model, a computer-based economic tool that calculates multipliers to estimate the direct and indirect effects resulting from a given action. Changes in spending and employment associated with the renovation of housing represent the direct effects of the action. Based on the input data and calculated multipliers, the model estimates changes in sales volume, income, employment, and population in the ROI, accounting for the direct and indirect effects of the Proposed Action.

For purposes of this analysis, a change is considered significant if it falls outside the historical range of ROI economic variation. To determine the historical range of economic variation, the EIFS model calculates a rational threshold value (RTV) profile for the ROI. This analytical process uses historical data and calculates fluctuations in sales volume, income, employment, and population patterns within the ROI. The historical extremes (i.e., the RTVs) are the significance thresholds for social and economic change. If the estimated effect of an action falls above the positive RTV or below the negative RTV, the effect is considered to be significant. Appendix B discusses this methodology in more detail and presents the model input and output tables developed for this analysis.

When full implementation of a Proposed Action is expected to occur over a multi-year timeframe, as is the case with the Proposed Action at Fort Benning, the EIFS model is run using the peak year of change (refer to Appendix B for further explanation of the EIFS methodology and input numbers). By selecting the peak year for consequences analysis, the model estimates the maximum annual effect of the Proposed Action. Hence, if the consequences threshold is not exceeded in the peak year, it would not be exceeded in any other year. To be consistent with the EIFS model, changes in demand for public schools and housing also are based on peak year. For housing, if the demand created by the Proposed Action exceeds 95 percent of the available supply, the significance threshold would be exceeded. For schools, the threshold for significance is if the number of incoming school age children surpasses the planned future physical capacity of the affected local schools. Increases in student populations without the provision of additional schools and teachers would result in increased student-teacher ratios.

4.5.2.1 No Action Alternative

Because the BRAC/Transformation actions will be implemented, regardless of the decision taken under this Proposed Action, they must be included in the No Action Alternative. The No Action Alternative, therefore, includes FY09 through FY13 BRAC/Transformation projects. A brief description of the impacts associated with the BRAC/Transformation projects is presented below. A full description of the assumptions used in this analysis is presented in Appendix B.

Economic Development

Significant direct and indirect effects are expected. The increase in personnel would generate a 6.55 percent increase in the region's employment levels which exceeds the region's RTV of 5.1 percent. The No Action Alternative would also generate a significant increase in sales volume of 15.63 percent and a 6.2 percent increase in regional personal income.

Demographics

Minor direct and indirect effects would be expected. Under the No Action Alternative, incoming military and civilian personal would lead to a population increase slightly below historical RTV values.

Housing

Minor direct and indirect effects would be expected. Under the No Action Alternative, there would be a minor increase in the demand for housing. The increased housing demand approximately 27 percent of the available housing supply. This increase in demand could potentially result in minor increases in housing costs. When compared to baseline conditions, Zone III noise levels increase by 5 percent (or 1,900 aces) and impact 96 RCI housing buildings (personal communication, Leeder 2009).

Quality of Life

Schools. Significant negative direct effects would be expected without funding for increased school capacity due to the influx of school age children associated with military personnel, civilian, and contractor personnel living off-Post. At the individual school level, significant negative impacts could be expected depending on how incoming families and their children distribute themselves, as well as the age distribution of the children. A total of up to 5,146 students may be added to the ROI (Fort Benning 2005).

Services. Minor negative effects would be expected. The increase in population would increase the ration of ROI residents to public employees for each of the public services unless additional workers are hired. Even in the absence of additional hiring, there would not likely be any perceptible reduction in the level of services provided to the ROI population.

Recreational facilities. No significant effects on recreational facilities would be expected.

Environmental Justice

No disproportionate or adverse impacts are expected to low-income or minority populations; therefore, impacts would not be considered significant for environmental justice issues. Noise was evaluated for its potential effects to these populations; other risks such as air pollutants and safety from traffic and training activities are covered in their respective resource sections. These risks are not covered here because there would be no adverse impacts to the general population; therefore, no adverse risks to this more select population. For this evaluation, noise impacts would be considered adverse if these low-income and minority populations were exposed to expanded Zone III noise levels; refer to Section 4.8 for detailed discussion of noise and its human and environmental effects.

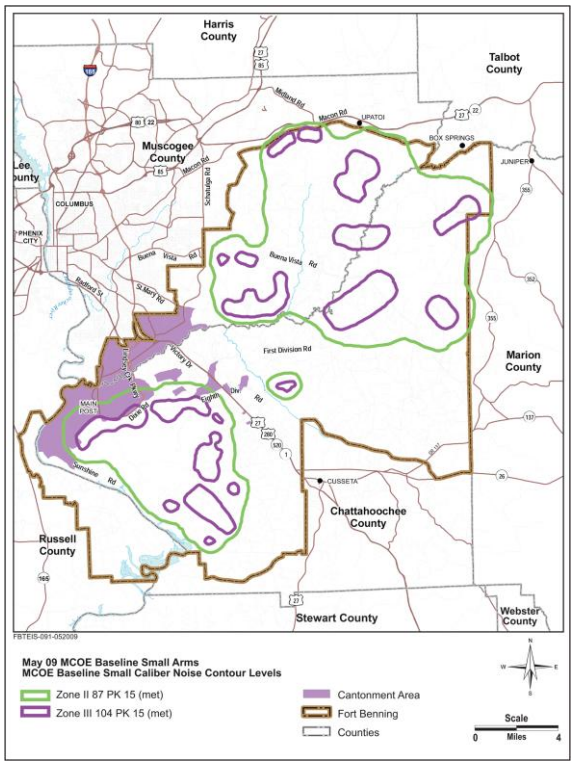
As indicated in Table 4.5-5, there are low-income and minority population s found adjacent to Installation boundaries; Figure 4.5-2 illustrates noise levels generated by both small- and large-caliber weapons firing for both baseline and No Action conditions. Under the No Action Alternative only one area off-Post in Marion County would be exposed to small- or large-caliber Zone III noise contours, and that is found in Census Block Group 9801-2 (see Table 4.5-5).

The census block data indicate that 22 percent of the population in the block lives below poverty level (compared to a 16-percent level in the ROI); therefore, there is a potential for disproportionately higher impacts if populations are found under Zone III noise levels. In terms of minority populations, there is a representation of about 12 percent in the census block, while the ROI supports about 43 percent minority populations; therefore no disproportionately higher impacts would be expected.

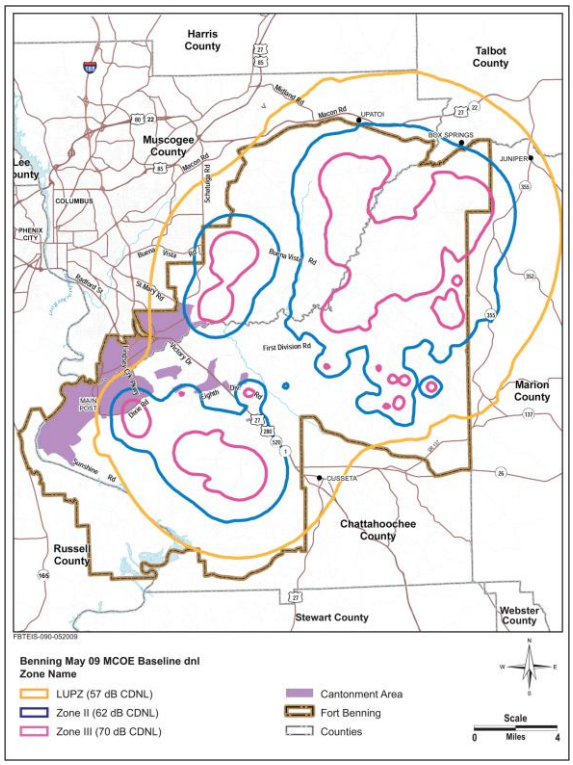
Under No Action, there would be only one residence within the Census Block 9801-2 exposed both to small- and large-caliber Zone III noise levels. While this impact could be considered adverse, the same residence is exposed to similar noise impacts under baseline conditions and therefore, impacts would not be considered significant—no new off-Post populations are exposed to Zone III noise levels from those found under baseline conditions. Figure 4.5-2 provides the reader with noise zones for both baseline and No Action.

Protection of Children

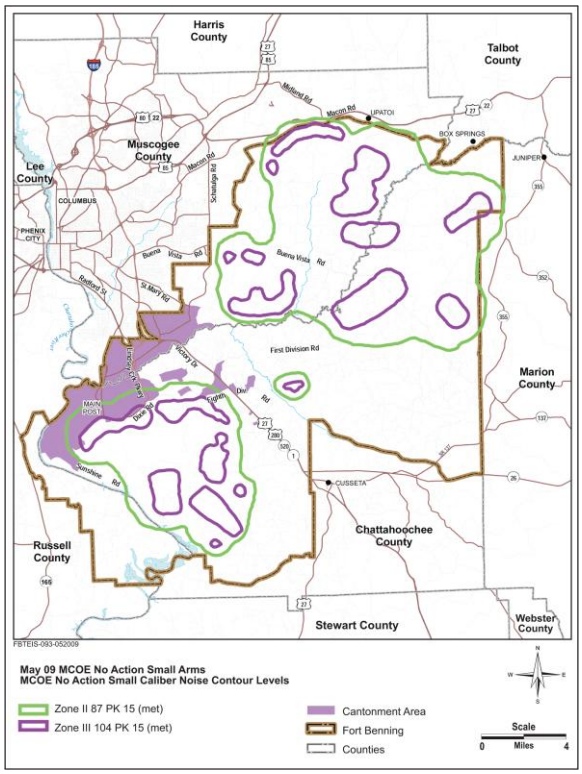
The No Action Alternative would not result in impacts to the health of children. The primary effects of the project are beneficial to the economy and would confer commensurate benefits on the child population.



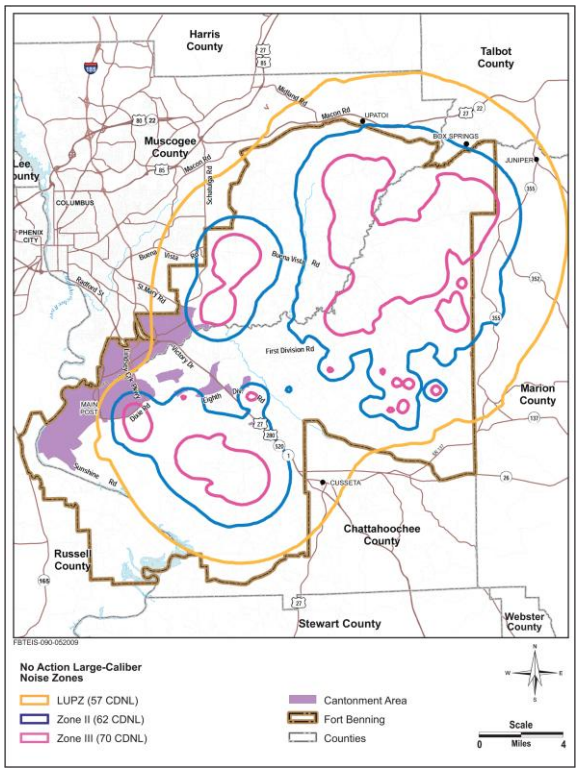
Baseline—Small-Caliber Generated Noise



Baseline—Large-Caliber Generated Noise



No Action—Small-Caliber Generated Noise



No Action—Large-Caliber Generated Noise

Figure 4.5-2: Baseline and No Action Alternative Noise Zones

4.5.2.2 Alternative A (preferred alternative)

Summary of Assumptions

For purposes of running the EIFS model, the peak year for incoming personnel and the peak year for construction spending for Alternative A were selected to determine the maximum impact that the Proposed Action could have on the regional economy. It was also assumed that all of the construction spending would be expended within the ROI. This approach was used to determine whether the ROI could accommodate projected growth from the most intense spending scenario based on the region's RTV. Since EIFS measures impacts based on historical year-to-year changes in economic indicators, 2011 was selected as the peak year because it reflects the year in which the combined effects of the incoming military personnel and construction would reach their maximum for the under Alternative A and the No Action Alternative which involves BRAC/Transformation actions. An additional 120 cadre members are expected to arrive after construction is complete, but their staggered arrival would minimize impacts during affected years. Another key assumption is that 100 percent of the 118 military personnel would live off-Post. It was estimated that approximately $19,300,000 would be spent in construction during the peak year of 2011 and 118 military personnel will arrive. Military students were not counted in the EIFS analysis for incoming personnel. Given their training status, they are not likely to contribute significantly to economic impacts. For the purposes of this analysis, military students are discussed in the context of on-Post housing availability.

Economic Development

No significant direct and indirect beneficial impacts would be expected from the addition of 118 permanent party military personnel. However, when this is considered along with the No Action Alternative, a total of 5,723 permanent party military personnel (118 from the Proposed Action and 5,605 from the No Action Alternative) and 3,226 total permanent party civilian employees would be added to Fort Benning. Alternative A (including the No Action Alternative) would generate a total net gain of 10,823 jobs in the Fort Benning economic ROI, including the BRAC/Transformation EIS 4,589 induced jobs during the peak year. This employment increase would represent a 6.79 percent increase in the region's employment levels that exceeds the maximum RTV value of 5.1 percent. Alternative A would also generate positive changes in other economic indicators including a 16.17 percent increase in sales volume (a significant beneficial impact), and a 6.46 percent increase in regional personal income (a minor beneficial impact). The EIFS inputs and outputs for Alternative A are presented below in Table 4.5-6 and Table 4.5-7.

Table 4.5-6: Alternative A: EIFS Inputs and Results

Forecast Input Category	Forecast Input Data	Forecast Output Category	Result	RTV (Percent)
Change in Local Expenditures	$603,292,800	Sales Volume-Direct	$667,422,800	16.17
Change in Civilian Employment	2,126	Sales Volume-Induced	$1,027,831,000	
Average Income of Affected Civilian	29,377	Sales Volume –Total	$1,695,254,000	
Percent Expected to Relocate	100	Income-Direct	$199,878,400	6.46
Change in Military Employment	1,128	Income-Induced	$181,766,900	
Average Income of Affected Military	$27,246	Income-Total (place of Work)	$381,645,300	
Percent of Military Living On-Post	17	Employment-Direct	6,234	6.79
Employment Multiplier	2.54	Employment-Induced	4,589	
Income Multiplier	2.54	Employment-Total	10,823	
		Local Population	7,625	2.88
		Local Population Off-base	8,102	

Table 4.5-7: RTV Values for Sales Volume, Income, Employment, and Population

	Sales Volume (Percent)	Income (Percent)	Employment (Percent)	Population (Percent)
Positive	10.86	10.16	5.1	3.06
Negative	-8.27	-6.15	-9.54	-2.17

Demographics

Minor direct and indirect effects would be expected. Incoming military and civilian personnel and their family members (which includes Alternative A and the No Action Alternative) would increase the ROI population by 8,102 or by about 2.88 percent during the peak year. This increase is slightly below negative historical RTV values. Effects in years other than the peak year would be expected to be less than those during the peak year, but would still have minor and indirect negative impacts.

Housing

Minor direct and indirect effects would be expected. Under Alternative A, there would be a minor increase in the demand for housing. Housing demand for the peak year is defined as the total number of households that would require off Post housing. The level of the demand for housing created by Alternative A was compared to the existing supply in the ROI as reported by U.S. Census Bureau data to determine whether or not the demand created by Alternative A (in combination with the No Action Alternative) would exceed 95 percent of the available supply. Effects in years other than the peak year

would be expected to be less than those during the peak year, but would still have minor and indirect negative impacts.

The EIFS model assumes that there are 2.49 people per household. Families accompanying military personnel do not increase the overall demand for housing because the incoming new employees are counted as one family unit. It should also be noted that not all of the military personnel would require off-post housing. It is estimated that 83 percent of incoming military personnel would live off Post in the ROI, with the rest living on the Installation. The calculation for total housing demand is as follows: 2,126 civilians+ (83 percent x 1,128 military personnel) = about 3062 households. This demand represents about 26 percent of available housing supply as indicated by the latest Census data on vacant housing units. As indicated in Table 4.5-2, there are 11,765 housing units available within the ROI. The increase in demand could potentially result in minor increases in housing costs.

The BRAC/Transformation EIS indicated that there are 25,190 barracks units available for unaccompanied enlisted personnel. The 7,238 students (without families) coming for the No Action Alternative, would still have to be accommodated by existing barracks housing that is not currently occupied, by new housing facilities being constructed under the No Action Alternative, or by off-Post housing availability or new construction. This increased demand for barracks should be met by the numerous proposed housing projects and training center projects. Additional demand for on-Post housing for officers and married personnel would also have to be met either by available on-Post housing as indicated by baseline levels, or by additional housing construction and cumulative housing-related projects.

Quality of Life

Schools. Given the new permanent party military and Department of the Army Civilian (DACs) personnel added to Fort Benning due to the No Action Alternative and the relatively small number under Alternative A, there could be an increase of up to 5,146 school aged students in the ROI over the 4 year MCOE transformation period. This assumes that increases in population are attributable to a Training Base Cadre of 3,375 (3,255 personnel + 120 cadre member for Alternative A) (Fort Knox Armor School and Center), 2,350 other military personnel, 1,226 government civilians, and 2,000 contractor personnel expected to be coming from outside the ROI. School aged student population is calculated as follows:

- Training Base Cadre personnel of 3,375 times the student growth factor of 0.65 (this factor is from Fort Benning historical data) for a total of 2,194 students. Approximately 83 percent of these families are expected to live off-Post within the ROI, so the students would total about 1,821.
- Other military personnel of 2,350 times the student growth factor of 0.484 (this factor is the Army standard) for a total of 921 students.
- Government, civilian personnel of 1,226 times the student growth factor of 0.58 (this factor is from Fort Benning historical data) for a total of 711 students.

- Contractor personnel of 2,000 times the student growth factor of 0.9 (this factor based on Army Training & Doctrine Command, Fort Benning, and local community historical data) for a total of 1,800 students.

Any school age children accompanying the 83 percent of incoming military personnel who will live off-Post and civilian personnel and all high school students would have to be accommodated by the existing ROI schools. Some ROI schools would be able to absorb this excess, while others would not, and in reality, some schools and/or school districts may experience a greater influx of students than others. Incoming federally connected students could result in additional federal impact aid for ROI schools. As previously noted, total federal impact aid varies year by year according to congressional appropriations for the program, but in general federal impact aid has ranged from $250 to $2,000 per student (USACE 2007a).

School districts within the ROI have been planning for increases in enrollment related to growth at Fort Benning. Muscogee County Schools estimates nearly 30 percent increase in student population in the district school system and estimates as much as 50 percent growth in the student population of other school districts in the ROI. Muscogee County Schools have begun recruiting for an estimated 200 to 250 teachers at regional colleges and universities. The ROI school districts estimate the costs of the new school and classroom construction at nearly $350 million. To plan for, fund, and develop new schools, Muscogee County Schools is considering placing a referendum on the ballot to authorize a special tax increase over a limited period of time. In addition, the county schools are pursuing state funds and resources available through the DoD Office of Economic Adjustment, which makes federal resources available to communities affected by BRAC (USACE 2007a). Fort Benning has been working with the local school districts in these efforts. In addition, ROI school districts are pursuing state funds to increase capacity to minimize the impact of the incoming students. Because of these initiatives, it is not expected that the planned future physical capacity of the affected local schools would be surpassed, but funding and timing of the increased capacity remains a concern.

In addition, the proposed 195-child-capacity Child Development Center on the Installation should be able to accommodate up to 135 additional infant to pre-kindergarten children. The current facility accommodates 90 children, but current needs are for 150 children. An additional 60 children of existing demand and up to 135 children related to incoming personnel would be able to be accommodated by the proposed new facility.

Services. Minor negative effects would be expected for other public services including health, fire, and law enforcement. The increase in population would increase the ratio of ROI residents to public employees for each of the public services unless additional workers were hired. The additional tax revenues generated by the increased economic activity in the ROI could be used to pay for the additional workers needed to maintain current resident employee ratios. Even in the absence of additional hiring, there would unlikely be any perceptible reduction in the level of services provided to the ROI population.

Minor indirect beneficial effects would be expected for shops and other services due to the increase in the population. As indicated by the results of the EIFS Model, there would be minor increases in regional sales volumes and personnel income, but do not exceed historical RTVs.

Recreational facilities. No significant impacts on recreational facilities would be expected. The Transformation action would not have an effect on the operation of recreational facilities in the ROI.

Environmental Justice

No disproportionate or adverse impacts are expected to low-income or minority populations; therefore, impacts would not be considered significant for environmental justice issues. As found under baseline and No Action conditions, Alternative A operations would expose Census Block 9801-2 to both small- and large-caliber Zone III noise levels (Figures 4.5-3 and 4.5-4). While the zones grow, there is still only the one residence off-Post, which is already exposed to such levels under baseline conditions that would be affected.

Protection of Children

Alternative A would not result in any adverse environmental or health impacts to children. Health and safety concerns would be primarily related to construction activities. Construction of most new facilities; however, would occur in areas where no children reside or would be present. Furthermore, appropriate barriers would be constructed and signage installed to prevent accidental incursion of children onto dangerous work sites.

4.5.2.3 Alternative B

The potential socioeconomic consequences of implementing Alternative B would be similar to those described for Alternative A. Although small- and large-caliber noise contours shift slightly for Alternative B (see Figures 4.8-9 and 4.8-10), no new or different census block groups would be affected. The environmental justice impacts for Alternative B, therefore, are the same as those found under Alternative A—no significant adverse effects. In summary, environmental justice impacts would not significantly differ from what is found under baseline conditions if either of the action alternatives were implemented.

4.5.3 Mitigation Measures

While not an Army mitigation measure, the community would need to fund off-Post school construction under the No Action Alternative, to mitigate the potential for over-crowding in schools.

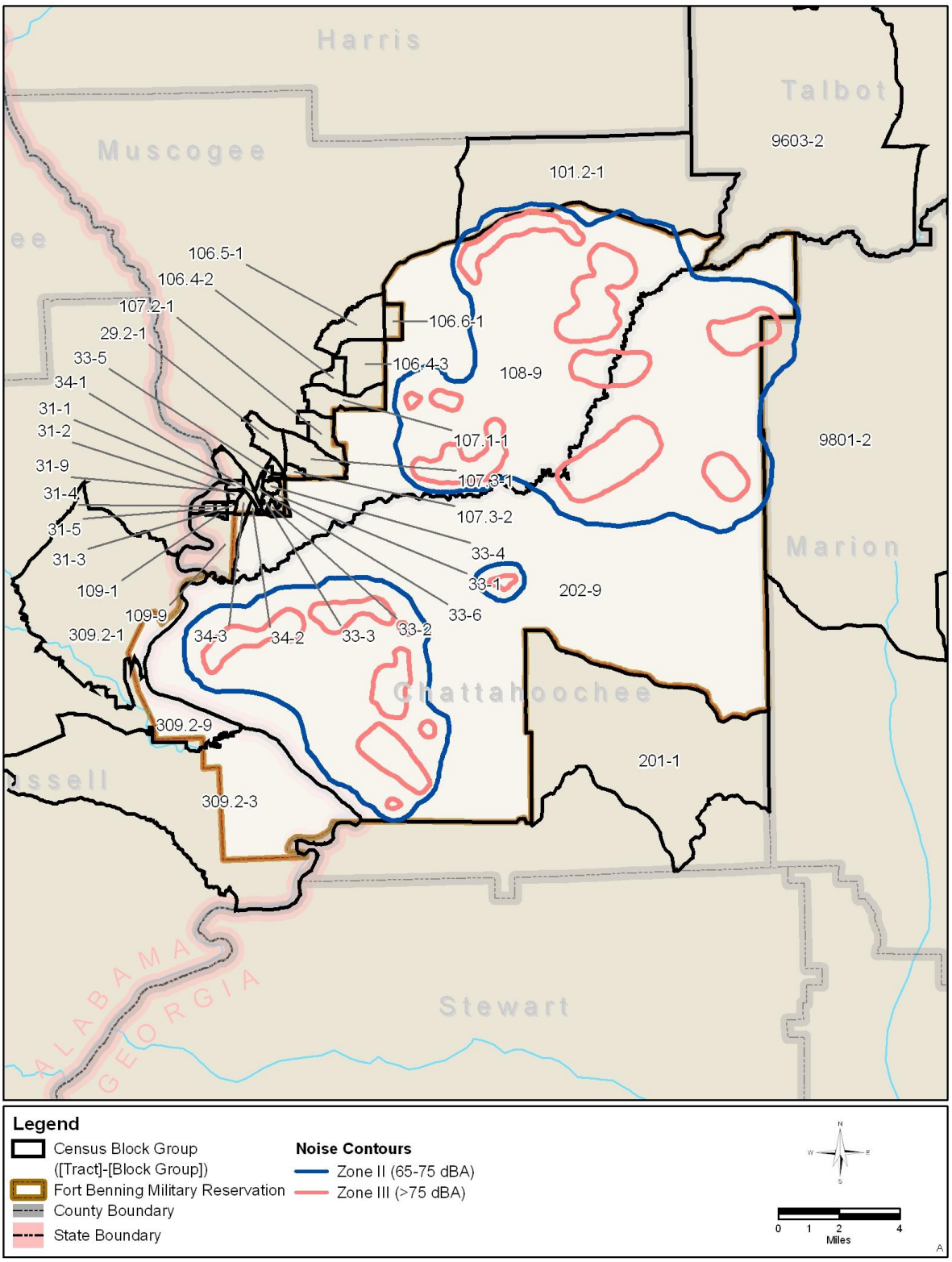


Figure 4.5-3: Census Blocks under Small-Caliber Noise Zones—Alternative A

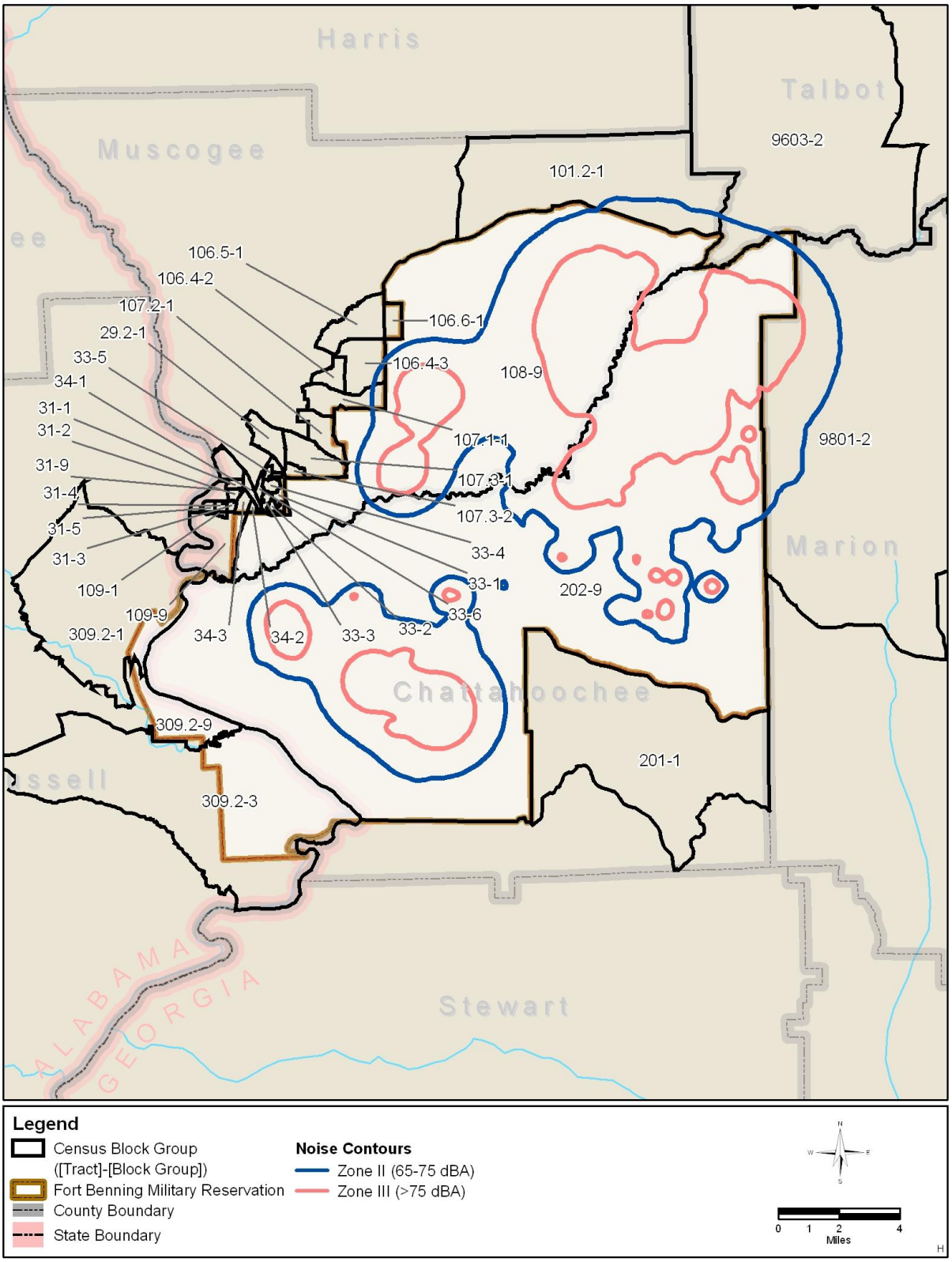


Figure 4.5-4: Census Blocks under Large-Caliber Noise Zones—Alternative A

4.6 TRANSPORTATION

A profile of transportation systems serving Fort Benning was developed using secondary data sources including traffic reports, existing reports, and existing documents. Existing transportation systems and conditions found during AM and PM peak hours (or 7:00 AM to 8:00 AM and 4:00 PM to 6:00 PM, respectively) are presented in the following sections.

4.6.1 Affected Environment

4.6.1.1 Description of On and Off Post Roadways

Fort Benning is located in Muscogee and Chattahoochee Counties in Georgia and Russell County in Alabama approximately 20 miles from both Columbus, Georgia and Phenix City, Alabama. Fort Benning is accessible by nine major federal, state, county, or multiple designation roads in both counties. Of the nine roads serving Fort Benning, the four most utilized access roads are Benning Boulevard, Lindsay Creek Parkway (I-185), South Lumpkin Road, and Victory Drive (U.S. Highway 27/280).

Off-Post Roadways

The cantonment is the secured portion of the Installation where most of the employment and all of the on-Post housing is located. Fort Benning has four cantonment areas including Main Post, Kelley Hill, Sand Hill, and Harmony Church, all of which are located in the western portion of the Installation and east of the Chattahoochee River, the Georgia-Alabama State boundary, and south of Columbus. There are access points in all directions of the Installation, but most of the access is from the north due to Fort Benning's relative location to the Columbus and Phenix City metropolitan areas. The main roads that provide access to Fort Benning are Benning Boulevard, Lindsay Creek Parkway (I-185), South Lumpkin Road, and Victory Drive (U.S. Highway 27/280) and are briefly described below:

- Benning Boulevard is a four lane, divided, limited access primary arterial that runs north-south and serves both regional and local commuter traffic in the Main Post cantonment and Columbus/Phenix City area. The main access control point (ACP) into Fort Benning is located on this road.
- Lindsay Creek Parkway (I-185) is a four lane, divided, limited access highway that runs in a north-south direction and is part of the regional road network that connects the Kelley Hill cantonment area with Columbus and points beyond. In addition to serving Kelley Hill, I-185 also provides access to the Main Post and Harmony Church cantonment areas by First Division Road. The intersection of I-185 and First Division Road is currently one of the most congested points at Fort Benning with long queues in the evening.
- South Lumpkin Road is a two-lane road that runs parallel to Benning Boulevard, approximately one-half mile to the west, and provides access to the Main Post cantonment area.

- Victory Drive (U.S. Highway 27/280) is a four lane divided limited access highway that runs through Fort Benning on a generally diagonal path from northwest to southeast and serves as a regional facility under different names providing access to Sand Hill and Harmony Church cantonment areas.

Access Control Points

There are seven ACPs (or gates) that control entry into the cantonment areas of Fort Benning. These ACPs were installed in 2001 throughout the perimeter of the cantonment areas (Figure 4.6-1) to restrict unauthorized access to Fort Benning. At each manned location, security guards check identification cards and inspect vehicles before allowing access into the Installation. The main gate is located near the intersection of Benning Boulevard and Custer Road. All visitors must use this ACP or another ACP near I-185(Lindsey Creek Parkway) (USACE 2007a).

Other methods such as drum/wedge, traffic arm barricades, and bollards have been placed on other paved roads, dirt roads, and trails that formerly provided access to restrict unauthorized access into Fort Benning. In addition, Fort Benning is in the process of establishing a physical security perimeter barrier (fencing, guard rail, or use of existing natural terrain barriers) to further restrict access by unauthorized vehicular movement into the main cantonment areas.

On-Post Roadways

The Fort Benning road network is comprised of primary, secondary, and tertiary roads. These roads are discussed by cantonment area below. In addition to cantonment areas, the Installation has designated maneuver, training, and range areas and associated buffer lands located in the north and south. U.S. Highway 27/280 and Georgia State Route 1/520 bisect the Installation northwest to southeast (see Figure 4.6-1) and act as the dividing line between these areas. Most activities at Fort Benning have specific transportation requirements. All administrative and private vehicular traffic must have:

- access to the Columbus expressway system;
- travel corridors between the cantonment areas; and
- traffic routes within the cantonment areas.

In addition, combat vehicles must move regularly between the cantonments, maintenance, and training areas and be provided with a separate system of tank trails. These trails have different design characteristics: wider lanes, stronger structure, and harder materials to accommodate wider and heavier vehicles and different traction systems.

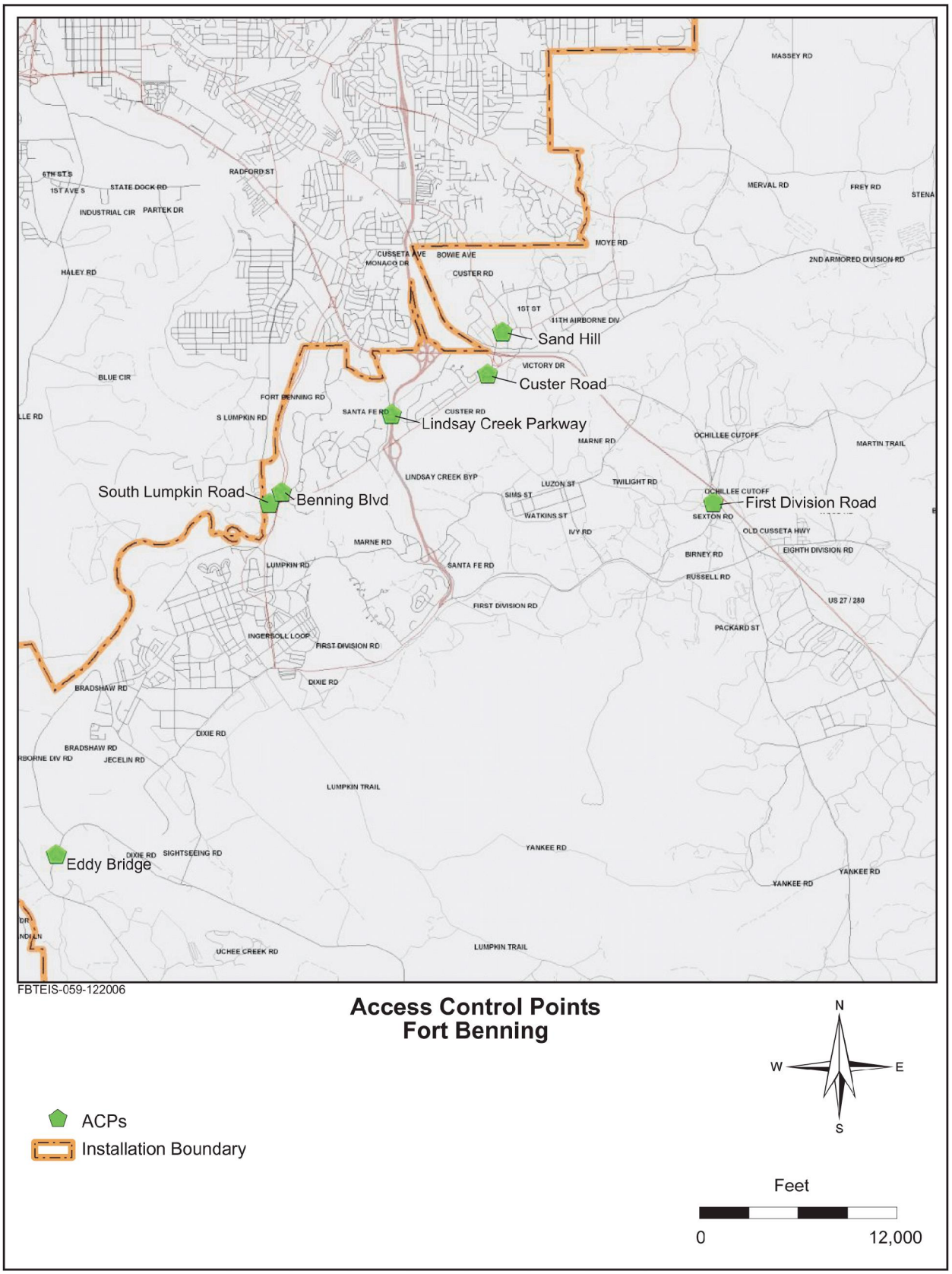


Figure 4.6-1: Fort Benning Access Control Points

Main Post

The largest cantonment area, Main Post, includes Lawson AAF and the hospital and mall complex. Travel outside of Main Post is concentrated on access to Columbus, Sand Hill, Harmony Church, and the Malone, Alpha, and Kilo training ranges. Access to Main Post is provided by two major traffic corridors, Benning Boulevard (north-south) and First Division Road (east-west). North-south traffic is also served by Lumpkin and Sigerfoos Roads and Edwards and Anderson Streets, and east-west traffic is also served by Tenth Division and Dixie Roads and Vibbert and Wold Avenues.

Benning Boulevard. Benning Boulevard is a four lane, divided arterial leading directly into the Main Post. According to the most recent traffic counts taken in 2006, the boulevard averages 20,500 vehicles per day. During the AM peak hour, 1,600 vehicles use the boulevard to enter Main Post and 3,400 vehicles use it to exit in the PM peak hours.

First Division/Dixie Roads. First Division/Dixie Roads are two lane, two-way roadways that combine and form the second major traffic corridor leading into Main Post. The Columbus expressway system is connected to Main Post through the First Division Road and Lindsay Creek Bypass interchange. Traffic volumes exceed 1,800 vehicles in the AM peak and 1,600 in the PM peak in both directions on the First Division/Dixie Road corridor.

Marne Road. Marne road is a two lane, two-way roadway that serves as a main access route to the hospital and mall complex, Kelley Hill, and Main Post from the Lindsay Creek Bypass. High traffic volumes (572 vehicles per hour) from the mall area and Kelley Hill create backups at the intersection of Marne Road and the east Lindsay Creek Bypass ramp. Eastbound drivers attempting to make a left turn (389 vehicles per hour) onto Lindsay Creek Bypass stack up through the west side intersection while waiting for a break in oncoming traffic.

Kelley Hill

Kelley Hill houses the 3rd Brigade of the 3rd Infantry Division (Mechanized). Access to Kelley Hill is provided by Marne and Ivy Roads. Travel outside of Kelley Hill is concentrated on access to Columbus, the hospital and mall complex, Harmony Church, and the Malone and Oscar Kilo training ranges. East-west traffic is served by Marne Road and Watkins Street, and north-south by Ivy Road and Bell Richards Street. Tank trails from Kelley Hill provide limited tracked vehicle access to Harmony Church and the Malone and Kilo training ranges. There are no heavy equipment transport loading facilities or tank trails to provide tracked vehicles access to Lawson AAF and the Sand Hill and Ochillee railheads.

Marne Road. Marne Road is a two lane, two-way roadway that links Victory Drive (U.S. Highway 27/280) to the Lindsay Creek Bypass (hospital and mall area) and Main Post through Kelley Hill. Traffic volumes are approaching 4,700 vehicles per day.

Ivy Road. Ivy Road is a two-lane, two-way road that links Kelley Hill to Main Post, Harmony Church, and the Malone and Kilo training ranges through First Division and Marne Roads.

Sand Hill

Sand Hill is a consolidated recruit reception and infantry basic training cantonment area consisting of unit administration, unaccompanied personnel housing, training, and some community support. Travel outside of Sand Hill is concentrated on access to Columbus, the hospital and mall complex, and the Malone training ranges. Access to Sand Hill is provided by Victory Drive, 11th Airborne Division Road, Old Cusseta Highway, and Custer Road. North-south traffic is served by Moye and Custer Roads, and east-west traffic by 11th Airborne Division, 2nd Armored Division, and 2nd Infantry Division Roads.

Victory Drive (U.S. Highway 27/280). Victory Drive is a four lane, divided arterial which connects the eastern half of the Installation to Columbus' expressway system and passes through Sand Hill, Harmony Church, and the central portion of the Post. The Victory Drive (U.S. Highway 27/280) and Custer Road interchange provides the main corridor for access to Sand Hill.

Old Cusseta Highway. Old Cusseta Highway is a two-lane, two-way road that connects Sand Hill with Harmony Church. The highway served as the main corridor for traffic between Sand Hill and Harmony Church prior to the Victory Drive and Custer Road interchange upgrade.

Custer Road. Custer Road is a two lane, two-way road that serves as the main corridor for access to Sand Hill from Main Post.

Harmony Church

The majority of Harmony Church training activities have been relocated to Sand Hill; however, the Ranger Training Brigade and a number of smaller units are expected to remain in Harmony Church. Travel outside of Harmony Church is concentrated on access to Columbus, Main Post, and the Malone, Alpha, and Kilo training ranges. Access to Harmony Church is provided by Victory Drive (U.S. Highway 27/280) and Eighth Division Road. North-south traffic is served by Hourglass, Axton, and Eighth Division Roads, and east-west by Old Cusseta Highway and Jamestown Road.

Victory Drive (U.S. Highway 27/280). Victory Drive is a four lane, divided arterial which passes through Sand Hill, Harmony Church, and the central portion of the Installation, and connects the eastern half of the Installation to the Columbus expressway system. The Victory Drive (U.S. Highway 27/280) and Eighth Division Road interchange provides the main corridor for access to Harmony Church.

Eighth Division Road. Eighth Division Road is a two lane, two-way roadway that serves as the main access to Harmony Church from Main Post.

4.6.1.2 Key Analysis Locations

The study area for transportation consists of 30 intersections located both on and off Post. Of these intersections, 15 intersections are signalized and 15 intersections are unsignalized. In addition, the 30 key intersections serve all four cantonment areas, specifically, 17 intersections for Main Post, 6 intersections for Kelly Hill, 3 intersections for Harmony Church, and 4 for Sand Hill. The key analysis locations within the project study area are as follows:

Signalized Intersections

- Lumpkin Road and Dixie Road
- Lumpkin Road and Wold Avenue
- Lumpkin Road and Vibbert Avenue
- Lumpkin Road and Marne Road
- Lumpkin Road and Custer Road
- Ingersoll Street and Wold Road
- Edwards Street and Dixie Road
- Edwards Street and Marchant Street
- Edwards Street and Wold Avenue
- Edwards Street and Vibbert Avenue
- Anderson Street and Marchant Street
- Marne Road and Vass
- 11th Airborne Division Road and 41st Infantry Regiment Street
- 11th Airborne Division Road and 23rd Infantry Regiment Street
- 11th Airborne Division Road and Moye Road

Unsignalized Intersections

- Ingersoll Street and Dixie Road
- Edwards Street and 10th Division Road
- Anderson Street and Wold Avenue
- Anderson Street and Vibbert Avenue
- Sightseeing Road and Dixie Road
- Jacelin Road and Dixie Road

- First Division Road and Ivy Street
- First Division Road and Dixie Road
- First Division Road and Lindsay Creek Bypass
- Marne Road and Ivy Street
- Watkins Street and Ivy Street
- Eighth Division Road and Wood Road
- Eighth Division Road and Jamestown Road
- First Division Road and Old Cusseta Highway
- 11th Airborne Division Road and 187th Infantry Regiment Street

4.6.1.3 Traffic Volume Development

In order to assess traffic conditions within the study area, comprehensive traffic data during the weekday AM and PM peak periods was used to analyze the existing operating conditions at the 30 key intersections within the study area. Traffic counts collected in April 2006 as part of the 2006 Fort Benning Comprehensive Traffic Study (Fort Benning 2006j) were used for the analysis (see also Appendix C). These traffic counts were taken conservatively, at a time when as few personnel as possible were not deployed, and include approximately 36,000 military, civilian, as well as student personnel.

4.6.1.4 Intersection Level of Service Methodology

The purpose of the capacity analysis is to determine the operational characteristics of key signalized and unsignalized intersections within the study area. The capacity analysis methodology is based on the concepts and procedures in the Highway Capacity Manual (HCM) 2000 published by the Transportation Research Board National Research Council, Washington, DC. The weekday peak hour data were analyzed to determine existing level of service (LOS) at intersections under various traffic flow conditions LOS ratings range from A (no congestion on the road) to F (roadways that are over capacity).

Detailed capacity analyses were conducted at the 30 key intersections in the study area using the Synchro software program based upon the analytical procedures described in the HCM. The criteria used to define LOS for intersections are described in the following sections.

Signalized Intersection

The LOS of a signalized intersection is defined in terms of control delay per vehicle (seconds per vehicle). Control delay is the portion of total delay experienced by a motorist that is attributable to the traffic signal. It is composed of initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The LOS criteria for signalized intersections, as defined in the HCM, are provided in Table 4.6-1.

LOS A describes operations with minimal delays, up to 10 seconds per vehicle, while LOS F describes operations with delays in excess of 80 seconds per vehicle. Under LOS F, excessive delays and longer queues are common as a result of over-saturated conditions (i.e., demand rates exceeding the capacity). Delays experienced at LOS A, B, C, or D (below 55 seconds per vehicle) are generally considered acceptable. LOS E and F represent unacceptable operating conditions.

Table 4.6-1: Signalized Intersection LOS Criteria

LOS	Control Delay per Vehicle (Seconds Per Vehicle)
A	≤ 10
B	> 10 to 20
C	> 20 to 35
D	> 35 to 55
E	> 55 to 80
F	> 80

Source: HCM 2000.

Unsignalized Intersection

The LOS for a stop sign controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. The LOS control delay is the portion of total delay experienced by a motorist that is attributable to a stop sign. The control delay is defined for each critical traffic movement in the intersection and is not defined for the intersection as a whole. The LOS criteria for unsignalized intersections, as defined in the HCM, are provided in Table 4.6-2.

Table 4.6-2: Unsignalized Intersection LOS Criteria

LOS	Control Delay per Vehicle (Seconds Per Vehicle)
A	≤ 10
B	>10 to 15
C	>15 to 25
D	>25 to 35
E	>35 to 50
F	>50

Source: HCM 2000.

4.6.1.5 Existing Condition Analysis

Detailed capacity analyses were conducted at the 30 key intersections during daily AM and PM peak hours for the Existing Condition without troop deployment using the Synchro software package. The results from the LOS analysis for the intersections are presented in Table 4.6-3 and in Figures 4.6-2 and 4.6-3. Based upon the results, most intersections operate at an acceptable LOS D or better during the AM and PM peak hours. Four intersections operate at LOS F during the AM peak hour and three intersections operate at LOS F during the PM peak hour. In addition, the LOS results are provided by cantonment area.

Existing Condition LOS - Main Post

The main roads in this area are Benning Road, Lumpkin Road, and Edwards Street in the north-south direction, and Dixie Road, Tenth Division Road and Wold Avenue in the east-west direction. The results from the LOS analysis for the Existing Condition in this area are summarized in Table 4.6-3. There are three intersections where the LOS drops to E or worse during the AM and PM peak hours. These failed intersections are: Lumpkin Road at Marne Road (LOS F in the PM peak hour), Lumpkin Road at Custer Road (LOS F in the AM peak hour), and Ingersoll Road at Dixie Road (LOS F in the AM and PM peak hours).

Existing Condition LOS - Kelley Hill

The main roads in this area are Ivy Road and Harvey Street in the north-south direction, and Marne Road and Watkins Street in the east-west direction. The results from the LOS analysis for the Existing Condition in this area are summarized in Table 4.6-3. There are two intersections where the LOS drops to E or worse during the AM and PM peak hours. These intersections are: First Division Road at Dixie Road (LOS F in the AM peak hour), and First Division Road at Lindsay Creek (LOS F in the AM and PM peak hours).

Please note, shaded rows indicate two-way unsignalized intersections. At these intersections, the overall LOS is not defined. Only LOS for the stop sign approaches is defined. The worst LOS of these two approaches is reported in the table.

Existing Condition LOS - Harmony Church

The main roads in this area are Jamestown Road and Old Cusseta Highway in the north-south direction and First Division Road and Eighth Division Road in the east-west direction. The results from the LOS analysis for the Existing Condition in this area are summarized in Table 4.6-3. There are no intersections where the LOS drops to E or worse during the AM or PM peak hours.

Existing Condition LOS - Sand Hill

The main roads in this area are Custer Road and Moye Road in the north-south direction and Eleventh Airborne Division Road in the east-west direction. The results from the LOS analysis for the Existing Condition in this area are summarized in 4.6-3. There are no intersections where the LOS drops to E or worse during the AM or PM peak hours.

Table 4.6-3: Existing Condition LOS

No.	Cantonment Area	Road A	Road B	AM Peak	PM Peak
1	Main Post	Lumpkin	Dixie	B	B
2	Main Post	Lumpkin	Wold	A	B
3	Main Post	Lumpkin	Vibbert	A	D
4	Main Post	Lumpkin	Marne	A	F
5	Main Post	Lumpkin	Custer	F	B
6	Main Post	Ingersoll	Dixie	F	F
7	Main Post	Ingersoll	Wold	B	B
8	Main Post	Edwards	Dixie	B	B
9	Main Post	Edwards	Marchant	A	A
10	Main Post	Edwards	Wold	A	A
11	Main Post	Edwards	Vibbert	A	A
12	Main Post	Edwards	10th Div	C	B
13	Main Post	Anderson	Marchant	A	A
14	Main Post	Anderson	Wold	C	B
15	Main Post	Anderson	Vibbert	B	B
16	Main Post	Sightseeing	Dixie	B	A
17	Main Post	Jacelin	Dixie	A	A
18	Kelley Hill	First Div	Ivy	C	B
19	Kelley Hill	First Div	Dixie	F	D
20	Kelley Hill	First Div	Lindsay Creek	F	F
21	Kelley Hill	Marne	Ivy	B	B
22	Kelley Hill	Watkins	Ivy	B	B
23	Kelley Hill	Marne	Vass	B	C
24	Harmony Church	Eighth Div	Wood	A	A
25	Harmony Church	Eighth Div	Jamestown	A	A
26	Harmony Church	First Div	Old Cusseta	B	B
27	Sand Hill	11th Airborne Div	187th	C	C
28	Sand Hill	11th Airborne Div	41st	A	A
29	Sand Hill	11th Airborne Div	23rd	A	A
30	Sand Hill	11th Airborne Div	Moye	A	A

Source: Adapted from Fort Benning, 2006j

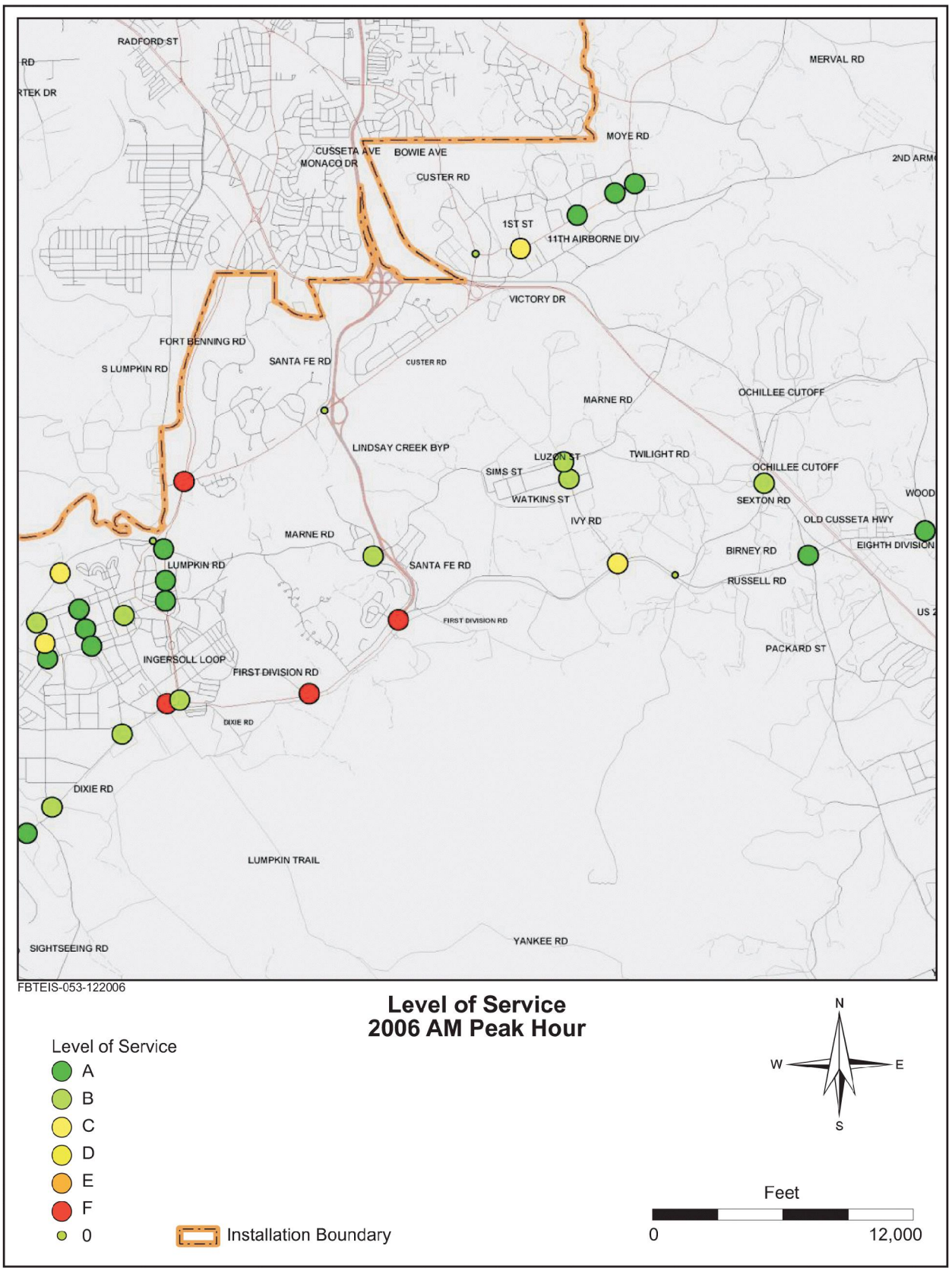


Figure 4.6-2: Existing Condition LOS, AM Peak

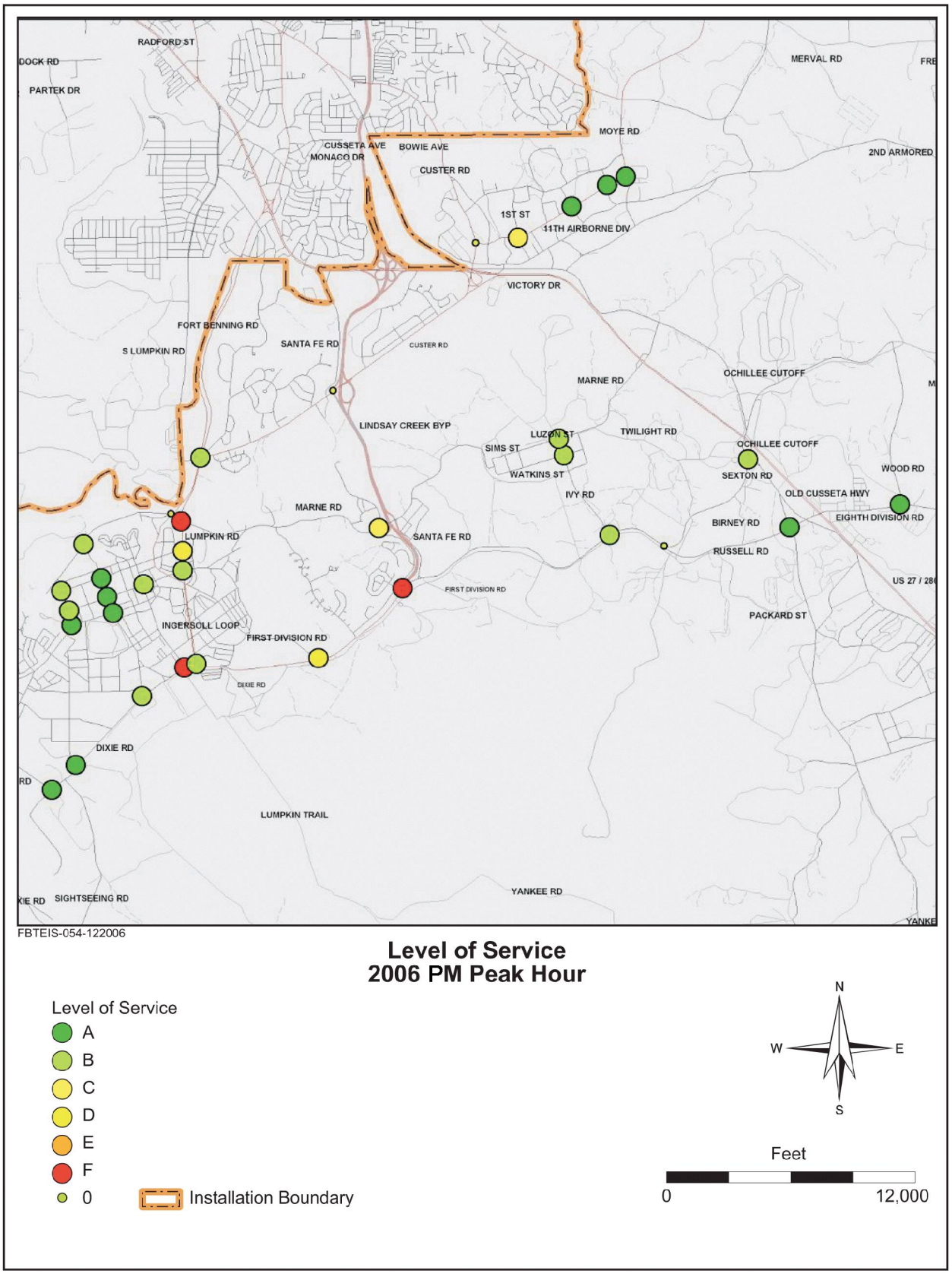


Figure 4.6-3: Existing Condition LOS, PM Peak

4.6.2 Environmental Consequences

The traffic consequences of the implementation of the No Action Alternative and the Action Alternatives are described in the following sections.

The following criteria have been developed to assess the transportation impacts for each of the alternatives:

> ***No Impact*** – No alterations of traffic patterns and trends would result from the action.
>
> ***No Significant Impact*** – Short or long term changes to the traffic patterns and level of service that would not cause an intersection to fail, as a result of implementing that action, beyond what is expected under the No Action Alternative. An intersection is said to have failed when it reaches LOS E or worse.
>
> ***Significant Impact*** – An impact would be considered to be significant if an intersection that had not failed under the No Action Alternative fails under an Action Alternative.

4.6.2.1 No Action Alternative

For transportation resources, the No Action Alternative volumes represent traffic conditions and are used as a baseline for comparison. The No Action Alternative incorporates all projects that were analyzed in the BRAC/Transformation EIS. Inclusion of these projects is necessary because the Army announced their decision to construct these BRAC/Transformation facilities in the ROD and they will be built regardless of this proposal (USACE 2007a). If any of these No Action Alternative projects are relocated or substantially change in size, the appropriate level of NEPA documentation and agency consultation will be completed by Fort Benning before any construction is undertaken. For purposes of the analysis, 2013 was used for comparison. As such, population growth was also taken into account.

In terms of population growth, the four-county region formed by Chattahoochee, Harris, Muscogee, and Russell counties grew at 0.2 percent per year between 1990 and 2005 (USACE 2007a). The population projections between 2005 and 2015 assume an annual average growth rate of 1 percent. Considering that traffic normally grows at a faster rate than population, these results also indicate the need to consider a positive rate to capture the future background growth. Therefore, the 1.2 percent annual growth rate observed at Benning Boulevard was used as the basis for the background growth rate for the future No Action and Action Alternatives.

Transportation Projects

Several buildings in Main Post, Kelley Hill, Sand Hill, and Harmony Church as well as range projects are identified in the BRAC/Transformation EIS and are approved to be implemented (Table 4.6-4). As such, these projects comprise the No Action Alternative. The impact that these new projects would have on the transportation infrastructure is measured by the number of trips the projects would generate combined with the current volumes and the background traffic growth expected from other non-BRAC/Transformation new development.

Table 4.6-4: No Action Alternative Traffic Impact

FY	PN	Project Title	Traffic Growth Projected
09	48644	Central Wash Facility	X
09	51256	Reception Barracks, Phase 2	X
09	64460	DS/GS Vehicle Maintenance Facility	X
09	64797	Tracked Vehicle Drivers Course	X
09	72017	Vehicle Recovery Training Area *	X
09	65035	Rifle/Machinegun Zero Range 1 (Z 1)*	X
09	65036	Rifle/Machinegun Zero Range 2 (Z 2)*	X
09	65037	Rifle Machinegun Zero Range 3 (Z 3)	X
09	65038	Rifle Machinegun Zero Range 4 (Z 4)	X
09	65039	Rifle/Machinegun Zero Range 5 (Z 5)*	X
09	65047	Modified Record Fire 5 (MRF 5)	X
09	65080	Consolidated Troop Medical Clinic	
09	65081	Medical Treatment Facility, Increment 1*	
09	65286	Armor Officer Basic Course Headquarters	X
09	65322	General Instruction Building Complex, Phase 1	X
09		Convert Non Unaccompanied Personnel Housing/Billeting Space to Transient	
09		Infantry Basic Officers Course Headquarters Complex Building	X
09		Student Dining Facility Main Post	
09	65383	Stationary Tank Range 2 (ST 2)*	X
09	65438	Vehicle Maintenance Instruction Facility	X
09	65578	Criminal Investigation Command Group (CIDC)/Brigade Headquarters Building	X
09	67419	Reception Station, Phase 3	X
09	67457	Infrastructure Support, Increment 2*	X
09	69358	Range Access Road—Good Hope Maneuver Training Area *	X
09	69668	Good Hope Training Area Infrastructure*	X
09	69742	Northern Training Area Infrastructure*	X
09	69743	Southern Training Area Infrastructure*	X
09	65554	Construct Training Area Roads Paved*	X
09	69741	Training Area Infrastructure – 19D/K OSUT*	X
09	65034	Fire and Movement Range 3 (FM 3)*	X
10	62207	Combined Arms Collective Training Facility, Phase 2	X
10	64491	Army Reserve Center/ Operations and Maintenance Services / Unaccompanied Personnel Housing Storage	X
10	65061	Armor Climate Control Storage Facility	
10	65079	Automated Combat Pistol/Military Police Qualification Course*	X
10	65284	MCOE Headquarters/CIDC Expansion	X
10	65405	Equipment Concentration Site	X
10	65557	Repair Existing Training Area Roads*	X
10	67458	General Instruction Building Complex (Increment 2)	X
10	67461	Hospital Replacement (Increment 2)*	X
11	38134	Barracks Complex Main Post	X
11	63799	3rd Infantry Division (ID) Brigade Combat Team (Heavy)	X

Table 4.6-4: No Action Alternative Traffic Impact

FY	PN	Project Title	Traffic Growth Projected
		Complex	
11	65395	SOF Ranger Support Company	
11	67012	Qualification Training Range	
12	65246	Community Activity Center*	X
12	65248	Physical Fitness Center*	X
12	62953	Rail Loading Facility Expansion*	X
12	64790	Battle Lab/Battle Command Training	X
13	62952	Brigade Complex Headquarters, 14th Combat Support Hospital	X
13	65065	Chapel Harmony Church	
13	65249	Chapel Sand Hill	

The resulting volumes under this scenario are the sum of the background traffic (existing volumes plus historic growth) plus the traffic volumes that result from the No Action Alternative. The LOS for different intersections resulting from this analysis is presented in Table 4.6-5 and Figures 4.6-4 and 4.6-5.

No Action Alternative LOS - Main Post

There are four intersections where the LOS drops to E or worse during the AM and PM peak hours compared to the Existing Condition. These intersections include Lumpkin Road and Dixie Road (LOS F from B in the AM and PM peak hours); Edwards Street and Dixie Road (LOS F from B in the AM and PM peak hours); and Dixie Road at Sightseeing Street (LOS F from B in the AM peak hour and A in the PM peak hour). It is also important to note that all intersections on Dixie Road have failed for the No Action Alternative.

No Action Alternative LOS - Kelley Hill

There are two intersections where the LOS drops to E or worse during the AM and PM peak hours compared to the baseline or existing conditions. These intersections include First Division Road and Ivy Road (LOS F from C in the AM peak hour) and First Division Road and Dixie Road (LOS F from D in the PM peak hour).

No Action Alternative LOS - Harmony Church

There are no intersections where the LOS drops to E or worse during the AM and PM peak hours.

Table 4.6-5: No Action Alternative LOS

Number	Cantonment Area	Road A	Road B	AM Peak		PM Peak	
				Existing	No Action	Existing	No Action
1	Main Post	Lumpkin	Dixie	B	F	B	F
2	Main Post	Lumpkin	Wold	A	A	B	B
3	Main Post	Lumpkin	Vibbert	A	A	D	F
4	Main Post	Lumpkin	Marne	A	A	F	F
5	Main Post	Lumpkin	Custer	F	F	B	B
6	Main Post	Ingersoll	Dixie	F	F	F	F
7	Main Post	Ingersoll	Wold	B	C	B	D
8	Main Post	Edwards	Dixie	B	F	B	F
9	Main Post	Edwards	Marchant	A	B	A	A
10	Main Post	Edwards	Wold	A	A	A	A
11	Main Post	Edwards	Vibbert	A	A	A	A
12	Main Post	Edwards	10th Div	C	C	B	B
13	Main Post	Anderson	Marchant	A	B	A	B
14	Main Post	Anderson	Wold	C	C	B	C
15	Main Post	Anderson	Vibbert	B	B	B	C
16	Main Post	Sightseeing	Dixie	B	F	A	F
17	Main Post	Jacelin	Dixie	A	C	A	C
18	Kelley Hill	First Div	Ivy	C	F	B	D
19	Kelley Hill	First Div	Dixie	F	F	D	F
20	Kelley Hill	First Div	Lindsay Creek	F	F	F	F
21	Kelley Hill	Marne	Ivy	B	B	B	B
22	Kelley Hill	Watkins	Ivy	B	B	B	B
23	Kelley Hill	Marne	Bass	B	B	C	C
24	Harmony Church	Eighth Div	Wood	A	B	A	B
25	Harmony Church	Eighth Div	Jamestown	A	C	A	C
26	Harmony Church	First Div	Old Cusseta	B	B	B	B
27	Sand Hill	11th Airborne Div	187th	C	E	C	F
28	Sand Hill	11th Airborne	41st	A	F	A	F
29	Sand Hill	11th Airborne Div	23rd	A	B	A	B
30	Sand Hill	11th Airborne Div	Moye	A	A	A	A

Source: Adapted from Fort Benning 2006j.

**Note*: Shaded rows indicate two-way unsignalized intersections. At these intersections, the overall LOS is not defined. Only LOS for the stop sign approaches is defined. The worst LOS of these two approaches is reported in the table.

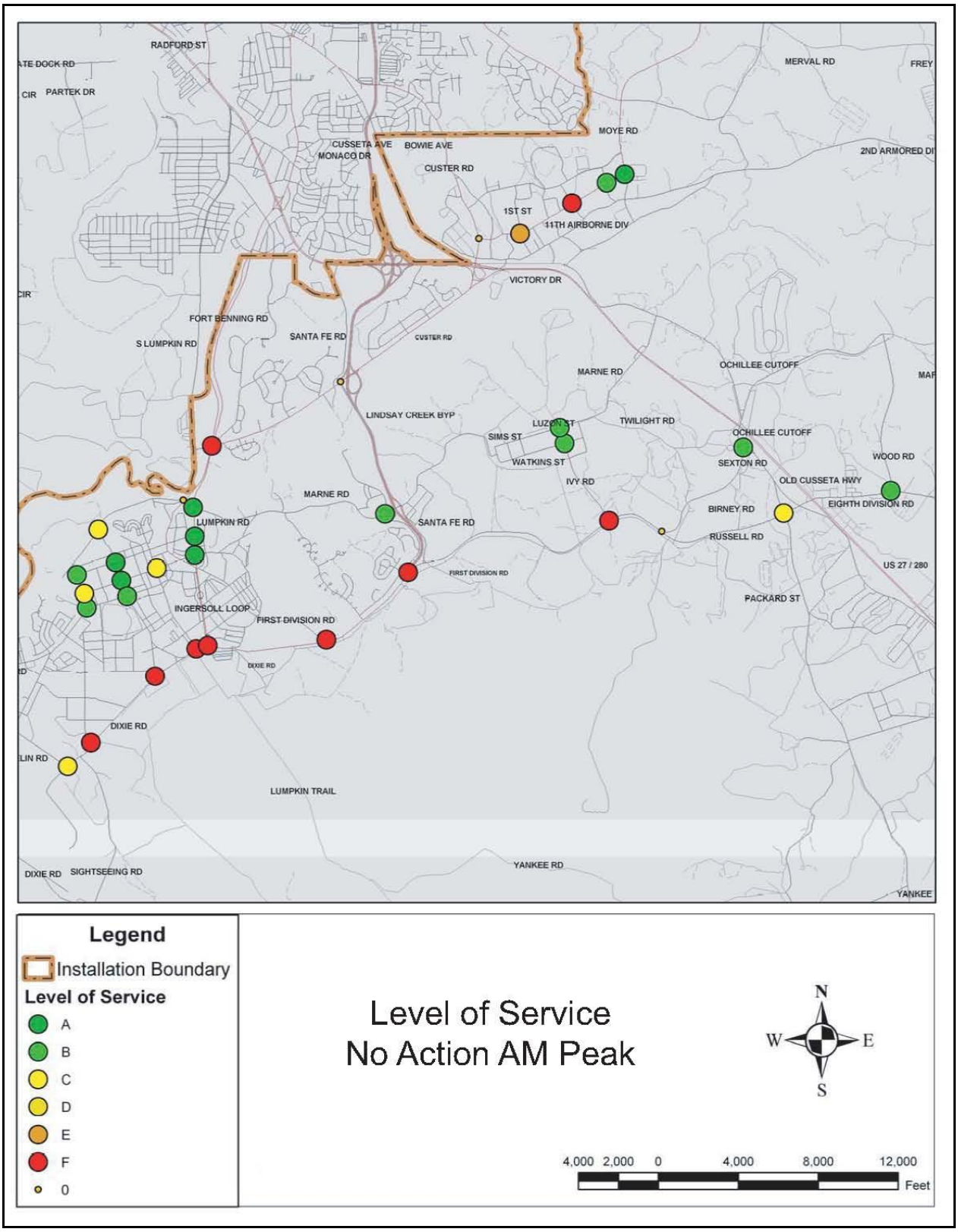


Figure 4.6-4: LOS Resulting From No Action Alternative, AM Peak

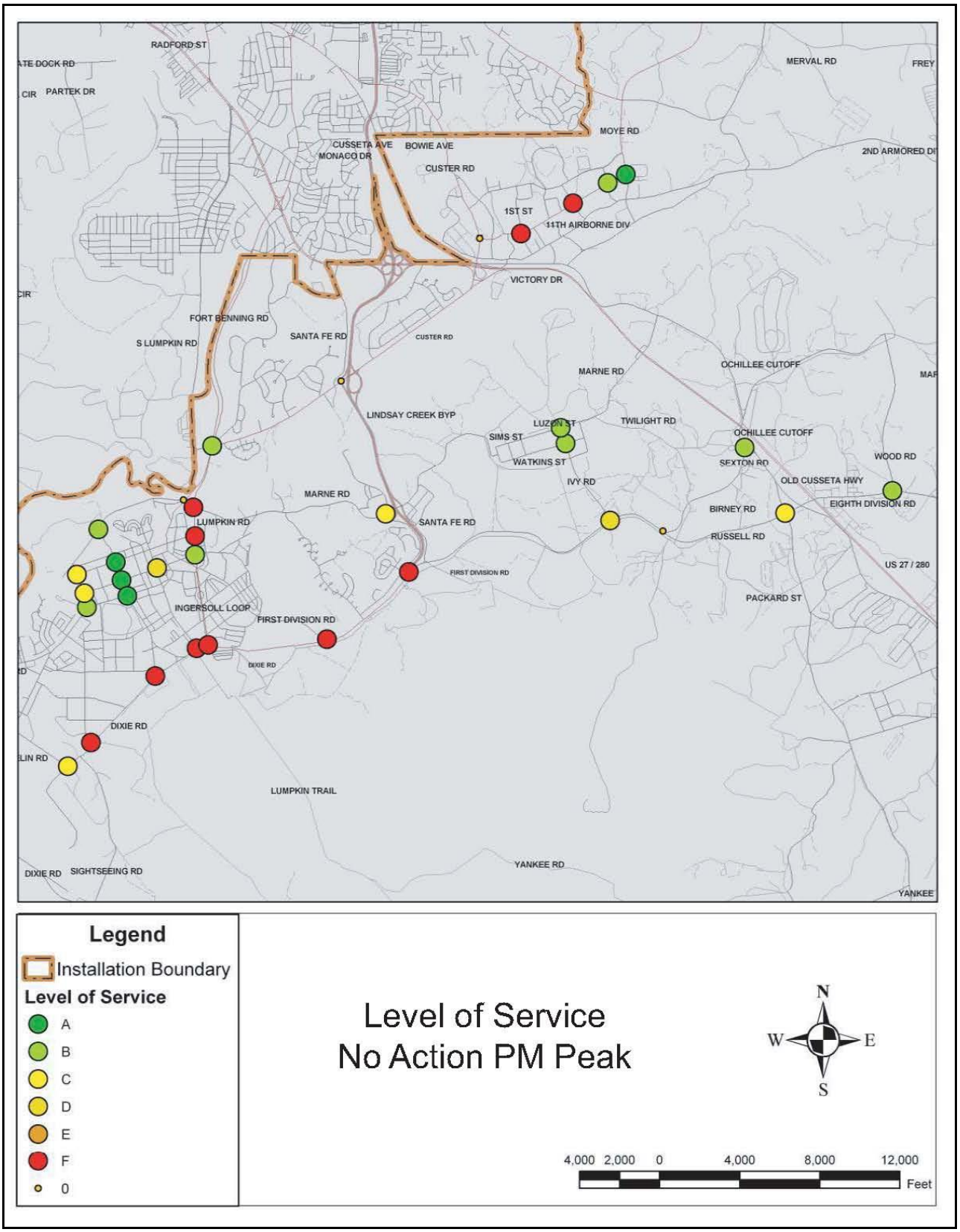


Figure 4.6-5: LOS Resulting From No Action Alternative, PM Peak Hour

No Action Alternative LOS - Sand Hill

There are two intersections where the LOS drops to E or worse during the AM and PM peak hours compared to the Existing Condition. These intersections include 11th Airborne Division Road and 187th Infantry Regiment Street (LOS E from C in the AM peak hour and LOS F from C in the PM peak hour), and 11th Airborne Division Road and 41st Infantry Regiment Street (LOS F from A under the No Action Alternative).

No Action Alternative LOS – Overall Impact

When making an overall comparison between the Existing Condition and No Action Alternative, there are more intersections failing under the No Action Alternative than under the Existing Condition (see Table 4.6-6). These results demonstrate that, as expected, the additional development and associated traffic volumes comprising the No Action Alternative increase the traffic and delays at Fort Benning.

Table 4.6-6: Overall LOS Comparison

LOS	AM Peak		PM Peak	
	Existing	**No Action**	**Existing**	**No Action**
E or F (failed)	4	10	3	10
C or D	4	5	4	7
	AM Peak		PM Peak	
Intersections with any decrease in LOS between Existing Condition and No Action Alternative	13		7	

4.6.2.2 Alternative A (preferred alternative)

The projects included in each alternative are presented in Table 4.6-7 and are grouped by project location; designated project number, construction start date, and the project name. Those projects that differ with Alternative B are listed in Table 4.6-8. In addition, each of these projects were assessed in terms of peak hour traffic generation and measured as negligible, limited, or measurable. In general, a total of between 0 and 5 peak hour trips generated by a project would be considered as negligible, between 6 and 10 peak hour trips would be considered as limited, and more than 10 peak hour trips would be considered as measurable.

Table 4.6-7: Alternative A (preferred alternative) Potential Traffic Impacts

PN	Construction Start Date (FY)	Project Name/Location/Size	
		Installation Wide	**Traffic Growth Projected**
65554	09	Construct Training Area Roads Paved	X
67457	09	Infrastructure Support, Increment 2 (Includes Security Fence and Dixie Road Expansion from Michaels Street to Sightseeing Road)	X
65557	10	Repair Existing Training Area Roads, Phase 1	X
		Cantonment Area—Harmony Church	
71065	09	Troop Store – Army and Air Force Exchange Service (AAFES) (Non-Appropriated Funds [NAF])	X
64460	09	Direct Support/General Support Vehicle Maintenance Facility	X
65322	09	Shop 1 Maintenance Facility	X
65246	12	Recreation Centers in Harmony Church and Sand Hill	X
65248	12	Physical Fitness Center, Harmony Church	X
62953	12	Rail Loading Facility Expansion	X
		Cantonment Area—Main Post	
70235	09	Hospital Replacement	X
69999	09	Warrior in Transition Complex	
71473	10	Water Treatment Plant Upgrade and Expansion	X
69151	10	Dining Facility to Support Advanced Skill Training (AST)	
65250	10	Maneuver Battle Lab	X
71620	10	Dental Clinic Addition (Bernheim Site)	
		Cantonment Area—Sand Hill	
69147	09	Trainee Complex Upgrade	X
70027	10	Classrooms with Battalion Dining Facilities	
64481	10	Blood Donor Center	
70026	10	Classrooms with Battalion Dining Facilities	
72322	10	Training Barracks Complex, Phase 1	X
69150	10	Classrooms & Dual Battalion Dining Facilities	
72324	11	Training Barracks Complex, Phase 2	X
72456	11	Training Dining and Classroom Facilities, Phase 2	
72457	11	Training Dining and Classroom Facilities, Phase 2	
69745	12	Training Barracks Complex, Phase 3	X
65249	13	Chapel	X
		Ranges North of U.S. Highway 27/280	
72017	09	Vehicle Recovery Course (GMD)	X
65035	09	Basic 10M – 25M Firing Range 1 (Z 1)	X

Table 4.6-7: Alternative A (preferred alternative) Potential Traffic Impacts

PN	Construction Start Date (FY)	Project Name/Location/Size	
		Ranges North of U.S. Highway 27/280 (cont.)	**Traffic Growth Projected**
65039	09	Basic 10M – 25M Firing Range 5 (Z 5)	X
65036	09	Basic 10M – 25M Firing Range 2 (Z 2)	X
65049	09	Modified Record Fire 7 (MRF 7) – 5.56mm: M855 Ball	X
65043	09	Modified Record Fire 1(MRF 1) – 5.56mm: M855 Ball	X
64551	09	Multi-Purpose Training Range 1 (MPTR 1) – 25mm, 120mm, 7.62mm, 5.56mm & .50 Caliber (Cal)	X
65033	09	Fire and Movement Range 2 (FM 2) – 5.56mm: M855 Ball	X
69741	09	19D/K OSUT (Heavy Mounted/Dismounted Training in TA- L1, O12-14, and portions of O15 and Heavy Mounted Training in TA-O14, O15, and L1-5)	X
69742	09	Northern Training Area Infrastructure (Heavy Mounted Training in TA-O1,O3,O11,O14, and O15)	X
69743	09	Southern Training Maneuver Area Infrastructure	X
65034	10	Fire and Movement Range 3 (FM 3) – 5.56mm: M855 Ball	X
65383	09	Stationary Tank Range 2 (ST 2)	X
64797	09	Drivers Training Course (Access Roads)	X
Ranges South of U.S. Highway 27/280			
65078	09	Anti-Armor Tracking And Live Fire Complex 1	X
69358	09	Range Access Road – Good Hope Maneuver Training Area	X
69668	09	Good Hope Training Area Infrastructure	X

X= Negligible Traffic Generation during Peak hours
❑= Limited Traffic Generation during Peak hours
●= Measurable Traffic Generation during Peak hours

Table 4.6-8: Alternative B Potential Traffic Impacts

PN	Construction Start Date (FY)	Project Name/Location/Size	
		Installation Wide	**Traffic Growth Projected**
65554	09	Construct Training Area Roads Paved	X
67457	09	Infrastructure Support, Increment 2 (security fence, and Dixie Road Expansion from Michaels Street to Sightseeing Road)	X
65557	10	Repair Existing Training Area Roads, Phase 1	X
Cantonment Area—Harmony Church			
71065	09	Troop Store - AAFES (NAF)	X
65039	09	Basic 10M-25M Firing Range 5 (Z 5)	X
64460	09	Direct Support/General Support Vehicle Maintenance Facility	X

Table 4.6-8: Alternative B Potential Traffic Impacts

PN	Construction Start Date (FY)	Project Name/Location/Size	
		Cantonment Area—Harmony Church (cont.)	**Traffic Growth Projected**
65322	09	Shop 1 Maintenance Facility	X
65246	12	Recreation Centers in Harmony Church and Sand Hill	X
65248	12	Physical Fitness Center, Harmony Church	X
62953	12	Rail Loading Facility Expansion	X
		Cantonment Area—Main Post	
70235	09	Hospital Replacement	X
69406	09	Unit Maintenance Facility	X
69999	09	Warrior in Transition Complex	
71473	10	Water Treatment Plant Upgrade and Expansion	
69151	10	Dining Facility to Support AST Training	
65250	10	Maneuver Battle Lab	X
71620	10	Dental Clinic Addition (Bernheim Site)	
		Cantonment Area—Sand Hill	
69147	09	Trainee Complex Upgrade	X
64481	10	Blood Donor Center	
70027	10	Classrooms With Battalion Dining Facilities	
70026	10	Classrooms With Battalion Dining Facilities	
72322	10	Training Barracks Complex, Phase 1	X
69150	10	Classrooms & Dual Battalion Dining Facilities	
72324	11	Training Barracks Complex, Phase 2	X
72456	11	Training Dining and Classroom Facilities, Phase 2	
72457	11	Training Dining and Classroom Facilities, Phase 2	
69745	12	Training Barracks Complex, Phase 3	X
65249	13	Chapel	X
		Ranges North of U.S. Highway 27/280	
72017	09	Vehicle Recovery Course (GMD)	X
65035	09	Basic 10M – 25M Firing Range 1 (Z 1)	X
65039	09	Basic 10M – 25M Firing Range 5 (Z 5)	X
65036	09	Basic 10M – 25M Firing Range 2 (Z 2)	X
65049	09	Modified Record Fire 7 (MRF 7)– 5.56mm: M855 Ball	X
65043	09	Modified Record Fire 1 (MRF 1)– 5.56mm: M855 Ball	X
64551	09	Multi-Purpose Training Range 1 – 25mm, 120mm, 7.62mm, 5.56mm & .50 Caliber (Cal)	X
65033	09	Fire and Movement 2 (FM 2) – 5.56mm: M855 Ball	X
69742	09	Northern Training Area used for existing maneuver training. No new infrastructure constructed in TA-L1, L2, and L3	X
65383	09	Stationary Tank Range (ST 2)	X

Table 4.6-8: Alternative B Potential Traffic Impacts

PN	Construction Start Date (FY)	Project Name/Location/Size	
		Ranges North of U.S. Highway 27/280 (cont.)	**Traffic Growth Projected**
64797	09	Drivers Training Course (Access Roads)	X
65034	10	Fire and Movement 3 (FM 3) – 5.56mm: M855 Ball	X
Ranges South of U.S. Highway 27/280			
65078	09	Anti-Armor Tracking and Live Fire Complex	X
69358	09	Range Access Road – Good Hope Maneuver Training Area	X
69668	09	Good Hope Training Area Infrastructure	X
69741	09	19D/K OSUT (Heavy Mounted/Dismounted training in TA-Q1, TA-Q2, Q3, and Q5)	X
69743	09	Southern Training Area Infrastructure	X
68733	10	Multi-Purpose Machine Gun 1-7.62mm & .50 Cal	X
65079	10	Automated Combat Pistol Qualification Course	X
65070	11	Multi-Purpose Machine Gun 2 – 7.62mm & .50 Cal	X

X= Negligible Traffic Generation during Peak hours
❑= Limited Traffic Generation during Peak hours
●= Measurable Traffic Generation during Peak hours

Only Alternative A and B Cantonment and Training Area Development projects that are projected to generate measurable traffic during the AM and PM peak hours were used to develop the action alternative traffic volumes. The AM and PM peak hour volumes from these sites would be added to the No Action Alternative traffic volumes during these periods to yield the action alternative traffic volumes. However, based on the results presented in Table 4.6-6, 35 projects would produce negligible traffic, 9 projects would produce limited traffic, and no projects would produce measurable traffic during the AM and PM peak hours. The action alternatives' traffic volumes and the associated LOS at the 30 key intersections would not significantly differ, and no additional significant impacts would be expected beyond those of the No Action Alternative in the BRAC/Transformation EIS.

4.6.3 Mitigation Measures

The mitigation measures outlined in the BRAC/Transformation EIS (listed below) for each cantonment area (Main Post, Kelley Hill, Harmony Church, and Sand Hill) would be sufficient to accommodate the traffic generation related to both Alternatives A (preferred alternative) and B.

Main Post

- Widening of Dixie Road to four lanes from Michael Street to First Division Road [Intersection(s) directly affected: (1) Lumpkin and Dixie, (2) Sightseeing and Dixie, and (3) First Division and Dixie] (Fort Benning 2006g).
- Widen Dixie Road to four lanes from Jacelin Road to Edmunds Road. This would connect to the 4-lane widening on Dixie Road past Edmunds Road that is already planned [Intersection(s) directly affected: Edwards and Dixie].

- The intersections of Dixie Road with Jacelin Road, Sightseeing Street, and Ingersoll Street are currently unsignalized. It would be advisable to install signals at these intersections based on the expected traffic volume in 2011. [Dixie Road corridor general improvement].
- Implement signal coordination on Dixie Road from Jacelin Road to First Division Road to improve traffic progression and reduce delays at successive intersections. [Dixie Road general improvement].
- Add turning lanes on the eastbound direction for left-turn movements on Dixie Road at Sightseeing Street, Edwards Street, and Ingersoll Street. [Dixie Road general improvement].
- Add southbound left-turn movement lanes on Sightseeing Street, Edwards Street, and Ingersoll Street. [Dixie Road general improvement].
- Optimize traffic signals on Lumpkin Road. [Intersection(s) directly affected: (1) Lumpkin and Vibbert and (2) Lumpkin and Marne].
- Reconfigure intersection of Marne and Lumpkin Roads. [Intersection(s) directly affected: Lumpkin and Marne].

Kelley Hill

- Construction of an overpass for the First Division Road traffic wishing to travel north into Lindsay Creek Parkway (currently an unsignalized intersection) before 2011. That would cause the LOS at this intersection to improve substantially [Intersection(s) directly affected: First Division and Lindsey Creek] (Fort Benning 2006g).
- Widening of First Division Road to four lanes from Dixie Road to Ivy Road [Intersection(s) directly affected: First Division and Ivy] (Fort Benning 2006g).
- Additionally, upgrade of the unsignalized intersection is recommended at Dixie and First Division Road to a signalized intersection to improve the LOS. [Dixie Road general improvement].

Sand Hill

- Installing traffic signals at the intersection of 11th Airborne Division Road and 187th Infantry Regiment Street. [Intersection(s) directly affected: 11th and 187th].
- Coordinate the signals on 11th Airborne Division Road west of Moye Road to reduce intersection delays and improve traffic progression. [Intersection(s) directly affected: 11th and 41st].

Harmony Church

- Construct a new interchange on U.S. Highway 27/280 at the intersection of Cusseta Road south of Hourglass Road. The design of this project needs to consider the possibility of its use by heavy armor vehicles traveling to the training areas. [General improvement] (Fort Benning 2006g).

No further mitigation would be necessary as a result of implementing either Alternative A or B.

4.7 UTILITIES

For this EIS, utilities are the basic services required by the Proposed Action to operate and include the following: potable water supply, wastewater and storm water systems, energy/power sources, communications, and solid waste.

4.7.1 Affected Environment

This section presents the baseline conditions for utilities, the ROI for direct and indirect effects that are associated with the Proposed Action and alternatives. The ROI includes Installation cantonment areas, training areas, and the surrounding communities (consolidated Columbus City-Muscogee County and Cusseta City-Chattahoochee County in Georgia and Phenix City in Russell County, AL). The main direct utility impacts of the action alternatives at Fort Benning are concentrated in the cantonment areas and mostly affect the nearby water supply and wastewater service capabilities of the three counties. Direct and indirect impacts from the action alternatives also would affect the storm water systems, energy sources, communications, and solid waste management of the nearby communities. However, these utility impact categories would have a lesser degree of impact than water supply requirements.

Construction activities for all utilities and infrastructure to support utilities identified in this section and the following subsections would be subject to the requirements of all applicable laws, regulations, and permits that may be required for construction. These may include, but not necessarily be limited to, stream bank buffers, NPDES and MS4 permits, which are described in more detail in Section 4.11.

4.7.1.1 Potable Water Supply

Fort Benning's water system is privatized and managed by the Columbus Water Works (CWW) to provide potable water to the cantonment areas. Fort Benning retains ownership of the underlying lands; however, the ownership, operation, and maintenance of the buildings, systems, and associated water facilities are the responsibility of CWW. Water use at Fort Benning varies widely depending on the number of deployed troops, but a peak pre-BRAC/Transformation use of 12 million gallons per day (mgd) is a realistic estimate (personal communication, Davis 2008). A new 750,000-gallon capacity water storage tank is being constructed in Harmony Church as part of the BRAC/Transformation action. Potable water supply to more remote areas of the Installation (including several ranges) is drawn from seven on-Post wells with existing withdrawal permits. However, the majority of potable water is drawn from the existing CWW system, pumped into water buffaloes (600-gallon tanks on transport trailers), and transported to the training compartments/sites.

4.7.1.2 Wastewater System

Fort Benning's wastewater systems are also privatized and managed by CWW. The sanitary sewage collection system consists of approximately 126 miles of 6- to 24-inch vitrified clay, cast iron, and concrete lines. Twenty-nine lift stations are required to move sewage flows across the rolling terrain of Fort Benning (USACE 2007a).

Recently the two Fort Benning wastewater treatment plants, with a combined 8.4 mgd permitted discharge, were taken off line and replaced with compatible service from CWW. A project analyzed within the BRAC/Transformation EIS is planned and expands the CWW wastewater treatment plant by 4.6 mgd additional maximum monthly treatment capacity, and a daily peak hydraulic capacity of 17.3 mgd (personal communication Davis, 2008).

4.7.1.3 Storm Water System

Storm water discharge in the Main Post drains directly into the Chattahoochee River through a storm drain system. Other on-Post storm water is collected and discharged through a series of culverts, ditches, swales, natural seepage, and overland flow. Storm water from Sand Hill and Harmony Church, as well as the training compartments, drain directly or indirectly into nearby surface water bodies.

Fort Benning operates industrial activities subject to the requirements of the USEPA and Georgia state industrial NPDES regulations under the CWA. These regulations involve regulating storm water discharges from industrial activities that have the potential to contaminate runoff. The applicable Installation industrial sectors include roads, vehicle maintenance facilities, wash rack, landfills, wastewater treatment facilities, hazardous waste storage areas, and treatment or disposal activities.

Installation sources of industrial storm water pollution have been identified in order to prevent uncontrolled contamination from runoff created by rain events to help protect the water quality. Thousands of vehicles are served by the motor pools and these areas and their equipment are maintained so leaks are minimized and storage of petroleum, oils, and lubricants (POLs) are managed properly. In compliance with federal and state laws, a Storm Water Pollution Prevention Plan (SWP3) has been developed and implemented at Fort Benning. The SWP3 outlines Best Management Practices (BMPs) that have been developed to reduce the potential for storm water pollution.

The CWA's Construction NPDES Program and Georgia Erosion and Sedimentation Control Act require that erosion and sedimentation controls be implemented during projects that require one or more acres of ground disturbance. Fort Benning (or its designee, such as a construction contractor) consistently obtains a General Permit for Storm Water Discharges via submittal of an NOI to the Georgia DNR. Alabama requirements apply when construction occurs in that state; however, under this proposal no construction or activities would take place there, so Alabama- related regulations are not addressed. Additional information about storm water management is provided in Section 4.11, Water Resources.

4.7.1.4 Energy Sources

Georgia Power supplies electrical power via two 115-kilovolt feeders into its substation on Marne Road. Voltage is transformed, metered, and fed to the adjacent Flint Energies-owned substation. Transmission lines leave this substation to supply power to the cantonment areas, family housing, and other developed areas of the Installation. Capacity and transmission quality upgrades to cross-county power lines throughout the cantonment areas are funded projects for FY08. Low-capacity electrical service is also provided to facilities (such as the northern portion of the Installation) in ranges and training areas in the more remote sections of the Installation. There is no on-Base power generation system for the entire

Installation, but emergency power generators are in place at critical locations, such as the airfield, control tower, hospital, communications center, stockade, water treatment plant, transmitter sites, radio beacon sites, and steam plants.

Atmos Energy supplies natural gas to Fort Benning at the rate of 2.7 million cubic feet (mcf) per day. Mission and loads at the Installation determine the volume of natural gas used. Natural gas supplies the majority of non-mobile fuel requirements at the Installation and propane is the main energy source for the ranges (USACE 2007a). Expanded cross-country gas line coverage throughout the Post cantonment areas is funded for FY08 as part of the BRAC Transformation. The Installation uses propane as the backup and supplement to natural gas and has 25 tanks of 30,000 gallons each to provide propane storage. A peak shaving plant, constructed in 1959, is located in Building 1750, northwest of the main metering station on Edwards Street. The plant introduces a propane-air mixture to augment natural gas supply during peak loads, and is capable of providing up to 312,000 cubic feet per hour through its 8-inch supply line. Two main distribution lines leave the Main Post metering station. One serves Main Post, with a branch to Custer Terrace family housing. The second runs to Kelley Hill and serves other family housing areas. Fuel oil is used as a backup fuel at Martin Army Community Hospital.

4.7.1.5 Communication Systems

The official business on-Post telephone system is operated and maintained by contract. Bell South (AT&T) provides the residential phone service to family and bachelor housing and other non-military users. Trunks to facilitate toll-free calling between the two separate systems interconnect the Army owned and Bell South systems. Currently, there are dated communication trunks found within the Harmony Church area which will be updated as part of an FY08 BRAC/Transformation project. Cellular phone service is supplied by multiple towers in Main Post, Harmony Church, and one on Marne Road serving Sand Hill and Kelley Hill areas (USACE 2007a). An Installation cable system is provided by Time Warner Cable Company.

The Fort Benning Fire Department operates a fire reporting communications system. The cable is carried with the telephone cable distribution system. This system allows emergency responders to immediately locate the place of origin of any emergency called in to the control center. Another major communications system at Fort Benning is the cable television system, which is operated by a private company. The contractor has the responsibility for operation and maintenance of the system under terms of a license. The Public Affairs Office (PAO) operates a separate educational television system in Infantry Hall. It operates under the call letters WFBG. The system is owned and operated by the Installation in support of military training. Currently, such systems are only available in the Harmony Church area of the Installation.

4.7.1.6 Solid Waste

Landfills. Fort Benning generates total solid waste at an estimated rate of 3,000 tons per month. The Installation does not have a permitted sanitary landfill in operation; all Fort Benning's sanitary waste is transported to a state-permitted transfer station in Salem, AL by a licensed waste management contractor.

The waste is transferred to a landfill operated by Waste Management with a capacity of 10 million tons over the next 75 years of its lifespan (USACE 2007a). There is one 20-acre approved inert landfill on the Installation in operation since 2004, which was expanded from 12-acres to 20-acres in 2008. This landfill was approximately at half capacity in 2006 (USACE 2007a). This landfill is for Installation use only, and not for contractor use, and is designed to accept only inert materials such as fallen limbs and trees, concrete (free of lead base paint), and cured asphalt. Fort Benning contracting practices require construction contractors to develop a waste management plan to identify measures to reduce construction and demolition materials by 50 percent through reuse and recycling (USACE 2007a). This plan is submitted for review and approval to Fort Benning Environmental Division prior to any construction/demolition activities. All construction and demolition (C&D) debris is taken to off-Post local landfills that are properly permitted. Additional waste reduction is accomplished by the Installation following guidelines in the Qualified Recycling Program.

Recycling. Recycling reduces disposal cost, conserves natural resources, and minimizes environmental problems associated with land disposal. Fort Benning's policy on recycling is guided by the DoD Pollution Prevention instruction, the "Qualified Recycling Program" (DoD 1996) and Executive Order 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, dated 14 September 1998 (DoD 1998). Under these policies, Army personnel, contractors, tenants and family housing are required to actively participate in the recycling program, and all of the proceeds from the program are retained by the Installation. One recycling center processes recyclable items from industrial work areas, barracks, and family housing areas. On the Main Post, six large trailers and associated bins are available for drop-off recycling. There are also six large trailers that are mobile and used for public gatherings and at the Motor Pools. Recyclable items include paper (approximately 120 tons per year [tpy]), cardboard (approximately 1200 tpy), aluminum cans (approximately 8 tpy), glass (approximately 12 tpy), and plastic (approximately 12 tpy). Also, approximately 91 tons of tires, 92 tons of oil, 435 tons of scrap metal, and 274 tons of ammunition-related recycling (i.e., brass, links, shells, fuzeheads) are processed annually (USACE 2007a). Recyclable materials are turned in to the Installation Defense Reutilization Marketing Service (DRMS) and the Materials Recovery Facility for processing.

4.7.2 Environmental Consequences

The assessment of impacts to utilities is based on comparing baseline conditions to those found under the alternatives. The threshold level of significance for utilities is the potential for change in demand that would adversely affect the ability of a utility provider to service existing customers; in addition, significance is determined by the ability of facilities to effectively accommodate additional demands.

4.7.2.1 No Action Alternative

Under the No Action Alternative, Fort Benning's utility demand due to the BRAC/Transformation actions was not found to be significant. The action alternatives differ from the No Action Alternative primarily because of the CWW increase in permitted water withdrawal.

4.7.2.2 Alternative A (preferred alternative)

Implementation of Alternative A would result in the need to connect and distribute supporting utility systems to multiple facilities and building sites in the Main Post, Sand Hill, and Harmony Church areas including: potable water, sanitary sewer, storm drainage, electrical, information systems, and solid waste disposal. Additional utilities would be provided for projects that would require increased capacity; otherwise, existing systems are expected to have adequate capacity to provide for these changes. Additions to the utility systems that have been privatized would be turned over to the commercial operator in accordance with existing agreements.

Potable Water Supply. Impacts from implementation of Alternative A would not be significant. New water-efficient devices, required under the Leadership in Energy and Environmental Design (LEED) program initiatives, such as low-flow showerheads, faucets, and toilets, provide opportunities to reduce demand on the potable water supply. This alternative includes projects for CWW to expand their capacity, and update and refurbish the Fort Benning Water Treatment Plant as the existing CWW system does not have the available capacity to meet the growth at Fort Benning. CWW has a total permitted withdrawal volume of 90 mgd to serve both Fort Benning and their public customers; this volume is adequate to meet the demand for both Fort Benning and the surrounding communities but the treatment and distribution of this supply to Fort Benning is an engineering problem for CWW. Alternative A would involve the CWW establishing a new permitted surface water withdrawal point on the Chattahoochee River. No changes would occur to Fort Benning's existing permitted surface water withdrawal from the Upatoi Creek. Consideration was given to another option that would upgrade the existing CWW plant with additional transmission lines to provide additional water service. This option would involve the installation of approximately 66,000 feet of new water transmission main through the City of Columbus with more environmental impacts than the action option in Alternative A and would cost an additional $32.5 million dollars above the Alternative A option (personal communication, Davis 2009).

A scoping comment questioned the placement of the inlet on the Chattahoochee River below the CWW sewage discharge point and suggested the Upatoi Creek as the inlet source. Discussion with CWW personnel indicated that the proposed location noted above would meet all federal and state drinking water requirements and that the Upatoi Creek, with less annual flow than the Chattahoochee River, is potentially more susceptible to possible drought scenarios than the Chattahoochee (personal communication, Davis 2008). Any new water supply lines would have a backflow preventer and water meter installed, and would be disinfected following American Water Works Association methods as required by Georgia Drinking Water Rule 391-3-5. Water tank repairs, water line replacement, and addition and replacement of fire hydrants would also occur. For potable water supply to remote areas, water will continue to be drawn from the CWW on-Post system and transported to the field in water buffaloes. It is anticipated that there is adequate capacity to meet proposed needs; however, if permitted levels are exceeded, a new permit would be required.

Wastewater System. Wastewater system requirements from implementation of Alternative A would not be significantly adverse. Based on a 109-gpd per capita use for sanitary wastewater, the minor projected population increase would not create a discharge capacity issue at the two Post treatment plants. The CWW wastewater treatment plant is currently being expanded for 4.6 mgd additional maximum monthly treatment capacity and can accommodate the additional demand from the Proposed Action (personal communication, Davis 2008). During construction and subsequent facility use, all wastewater discharges would be connected to the sanitary sewer system per Georgia Water Quality Control Rule 391-3-6. An industrial wastewater pretreatment system would be constructed to connect the vehicle maintenance facilities with the existing industrial wastewater treatment plant.

Storm Water System. Drainage from implementation of Alternative A proposed facilities would be controlled using grading, curbs, drains, gutters, and other standard construction practices to minimize storm water pollution and runoff. Project design would include construction and post-construction storm water controls designed to prevent offsite impacts from storm water runoff. Alternative A construction projects would entail the extension, replacement, or addition of storm water drainage infrastructure through digging of trenches or swales, either from existing lines along the nearest road or other primary locations. Stormwater conveyances will collect runoff from new buildings, roads, and motor pools to discharge points in existing systems or additional locations in local drainage systems. Sustainable design measures incorporating Low Impact Development technologies would be incorporated into these systems and retention and detention structures would be implemented to minimize impacts from uncontrolled storm water discharges. These LID strategies use of a variety of natural and designed features that reduce the runoff rate, filter pollution, and facilitate ground infiltration thereby reducing water pollution and maintaining water quality, increasing groundwater recharge, and stabilizing flow rates of stormwater runoff into nearby streams. Any facilities constructed for industrial operations, such as vehicle maintenance shops, would be designed to meet requirements under AR 200-1, as well as applicable state and federal requirements, and include oil/water separators in those portions of the storm water system. Such measures for utility systems would reduce the potential for adverse impacts from the storm water system. Additional information about storm water management is provided in Section 4.11, Water Resources.

Energy Sources. Increased demand for energy sources from implementation of Alternative A would be within the capability of providers and impacts are not considered significant. The building space and facilities to be constructed, as well as increases in training, would require additional electricity. The increased electricity demand would be handled by the upgraded electrical system infrastructure planned for Alternative A. Installing energy-efficient lighting, appliances, and insulation (per LEED certification requirements) could reduce the demand for electricity. The Department of the Army (DA) *Leadership in Energy and Environmental Design (LEED) Implementation Guide* was issued for use by all DA Installations in January 2008. Previously in 2001, the Army implemented its sustainable design tool criteria through the Sustainable Project Rating Tool to encourage the actualization of sustainable design in its projects. Starting in FY08, the DA determined that all vertical construction projects with climate

controlled facilities must achieve the SILVER level of LEED for New Construction (LEED-NC). This requirement applies worldwide to all construction on permanent Army Installations regardless of the funding source. Horizontal construction projects such as equipment storage areas, roads, and parking areas will be scored using LEED-NC and incorporate LEED features to the maximum extent possible. A Project Delivery Team is in place to document implementation of LEED features in the project design and is responsible for the preparation of report to the Regional Integration Team (RIT) Program Manager (PM) in those instances where there is a failure to achieve the LEED SILVER standard. This written report to the RIT PM and the engineering and construction cost engineering point of contact must provide an explanation as to why the SILVER level was not achieved. A "lessons learned" is part of this review process. The projects associated with the Proposed Action fall within the oversight of the 2008 LEED initiative and will follow the directives of that effort.

As noted above, the designer/engineer must demonstrate through the use of the LEED checklist that the interior design, materials selection, and utilities design for both water and electricity incorporate sustainability elements into the project design. The designer/engineer has the mandatory responsibility to consider the most practical energy efficient lighting; water conservation measures; advanced heating, ventilation, and air conditioning controls (HVAC); and building envelope materials. The DA ensures implementation of the above through the Bid-Design proposal process by requiring contractors to submit in their proposals what LEED measures will be implemented by itemizing them in the bid and being awarded points for incorporation of the LEED features. The DA uses the Unified Facilities Criteria (UFC) as a set of "living documents" that provide technical criteria for military construction projects. This criterion is periodically updated as technologies create opportunities for conservation and impact minimization. UFC 3-400-01, Energy Conservation, dated August 2008, is the latest UFC regarding energy conservation and whose energy savings tools and recommendations will be incorporated into the final planning and design of energy-related design criteria for the proposed action (UFC-3-400-01, August 2008). The UFC is not a voluntary process but is a mandatory set of criteria that must be implemented for all new construction and renovations. For example, this UFC requires that all energy consuming products shall be designated as using "low standby power" as required by Executive Order 13221.

Both recoverable and renewable energy shall be used in each design to the maximum extent that is life cycle cost effective. Consideration is given to a wide range of measures including optimization of building position and orientation to reduce energy consumption to heat and cool buildings. Other measures include the use of "cool roofs", use of natural lighting, sealing building envelopes for air tightness, and using HVAC centralized exhausts of nontoxic, non-flammable air streams with latent and sensible heat recovery employing heat exchangers rated for zero cross-contamination used to either reduce the ventilation air heating and cooling load or the energy consumption to heat or cool the ventilation air as appropriate.

Increased electrical demand is not expected to overload the current power generation supplied by Georgia Power. The installation and expansion of cross county gas lines that would occur under No Action would be sufficient to supply natural gas demanded by any additional personnel. The ranges would continue to be supplied by propane.

Communication Systems. Redundant and modern telecommunications infrastructure currently exists, communication lines are being constructed under the No Action, and wireless companies are continually expanding their networks. The implementation of Alternative A, therefore, would not have a significant impact on Fort Benning communication systems.

Solid Waste. Facilities being proposed under this alternative would generate construction and demolition debris that is generally concrete block or brick and metal. Under LEED SILVER level certification, construction contractors are required to minimize solid waste generation. Concrete or brick material would be crushed by construction contractors (per contract specifications) and recycled to the greatest extent possible as roadbed stabilization material throughout the Post. The contracts issued for such work includes specific language that recycling is a mandatory component of the work and that the contractors must adhere to the Fort Benning Recycling Policy as part of the contract agreement. With Alternative A, demolition and construction actions are projected over a multi-year period, the amount of recyclable debris should be readily consumed for road improvements. Any excess material not recycled in this manner would be hauled away by the contractor to a permitted landfill. Asbestos may be encountered as structures are remodeled or demolished to accommodate new facilities. Asbestos, if encountered, would be removed by licensed contractors in accordance with applicable federal and state laws and regulations and disposed of in a local asbestos-permitted landfill (see also Section 4.10, Hazardous Materials, Toxic Substances, and Hazardous Waste). To the extent practical, scrap metal would be recycled by the appropriate contractor.

The additional amount of solid waste generated as a result of the new MCOE would result in a substantial increase from current levels. The current and long-term solid waste management contract would need to be renegotiated to ensure that adequate service is provided. The privately-owned solid waste landfills in the region have adequate capacity (10-million ton capacity over the next 75 years) to accommodate the increased demand Fort Benning would be placing on the landfills (personal communication, Morpeth 2007a). The new BRAC-funded recycling center would be operational before the existing facility is closed so the Installation recycling program would continue to be implemented to minimize solid waste streams. Therefore, minor adverse impacts on solid waste disposal are expected.

Implementation of Alternative A would not result in any substantial increased use of utility systems than that found under the No Action Alternative; services in the cantonment areas and local communities are able to meet any increased capacity associated with increased student numbers. No impacts to utilities would occur under the preferred alternative.

4.7.2.3 Alternative B

Although there would be slight differences in training area improvements for the OSUT 19D/K project, an additional multi-purpose machine gun range, and the additional Automatic Combat Pistol Qualifications Course under Alternative B, there would not be any changes in the increased capacity as found under the preferred alternative. As with Alternative A, no impacts would result to utilities.

4.7.3 Mitigation Measures

No impacts are anticipated under the action Alternatives A or B when compared to the No Action. Utility providers are able to accommodate an increase in demand so no mitigation measures are required.

4.8 NOISE

In this section noise is defined, the noise environment at Fort Benning is presented and then compared with the potential impacts of the alternatives; the cumulative noise environment is presented in Section 4.16. The noise analyses presented in this EIS are nearly identical to those preformed for the BRAC/Transformation EIS; however, since its publication, the USACHPPM has updated the noise contours (USACHPPM 2009) which better reflects: 1) the baseline conditions found in the summer of 2008 (i.e., ranges that were constructed as a result of the BRAC/Transformation ROD); 2) conditions found under the No Action Alternative (which include range projects that would be built as a result of the BRAC/Transformation decision); and 3) projected noise levels that would occur if either Alternative A or B were implemented.

Noise Metrics. Not all people are affected the same way by the same sounds. In varying situations common sounds can interfere with our speech, disturb our sleep, or interrupt a routine task. When this occurs, these sounds become noise. Noise is usually defined as unwanted sound–sound that disturbs our routine activities, peace and quiet, and/or causes a feeling of annoyance. Whether the sound is interpreted as pleasant (like music) or unpleasant (like a barking dog) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound.

Sound intensity is measured in units called decibels (dB). The dB system of measuring sound provides a simplified relationship between the physical intensity of sound and its perceived loudness to the human ear. The dB scale is logarithmic; therefore, sound intensity increases or decreases exponentially with each dB of change. For example, 10 dB yields a sound level 10 times more intense than 1 dB, while a 20 dB level equates to 100 times more intense, and a 30 dB level is 1,000 times more intense. Table 4.8-1 presents noise levels in dB for typical sounds found in our environment and the reaction that might occur when a person (or receptor) is exposed to this noise.

The Army uses a widely accepted metric to measure environmental noise levels for their activities, the day-night sound level (DNL) measurement. This metric is recommended by the USEPA, used by most federal agencies when defining their noise environment, and applied as a land-use planning tool for predicting areas of potential annoyance both inside and outside of an Installation. DNL describes the average daily acoustic energy over an entire year—meaning that the whole spectrum of sound, from quiet to loud noises, is averaged across the year. The DNL metric also incorporates a “penalty” for nighttime noise (normally 10:00 p.m. to 7:00 a.m.) when loud sounds are more noticeable and annoying. However, when measuring noise levels from small arms and large-caliber sources, weighted noise metrics are used (USACHPPM 2006b). Peak noise levels are also measured to determined the maximum sound level experienced by a receiver during a single-noise event. This unweighted peak measurement, with no time averaging, is a good predictor of complaints (USACHPPM 2006b).

Table 4.8-1: Common Sound Levels Measured in Decibels

Source (at a given distance)	Decibel (dB) Level	Typical Reaction
Civil Defense Air Siren (100 ft)	140	Pain
	133	
Jackhammer (50 ft)	120	Maximum Vocal Effort
Pile Driver (50 ft)	110	
Ambulance Siren (100 ft)	100	Very Annoying/ Discomfort
Motorcycle (25 ft) Power Lawnmower	90	
Garbage Disposal (3 ft) Alarm Clock	80	Intrusive
Vacuum Cleaner (3 ft)	70	
Normal Conversation (5 ft) Dishwasher	60	Normal Speech
Light Traffic (100 ft)	50	
Bird Calls (Distant)	40	Quiet
Soft whisper (5 ft)	30	
Human Breathing	20	Just Audible
	10	
	0	

Source: USACHPPM 2006b.

The weighted measurements screen out the very high and low sound frequencies that cannot be heard by humans. A-weighted noise measurements reflect what people hear, noted as dBA or ADNL. A-weighting is typically applied to measuring noise for small arms activities. For low-frequency sounds that can cause vibrations, a C-weighting metric is used; noted as dBC or CDNL. Many find that these lower frequency sounds like artillery and explosions are more annoying than other noises so that is taken into account in this metric.

Noise Modeling. To derive the noise level contours, the following software models are used for evaluating small arms ranges, large-caliber ranges, and airfields:

- Small Arms Range Noise Assessment Model (SARNAM) calculates long-term and single events with impulse characteristics and displays noise level contours (in dBA of DNL) for firing operations at small arms ranges. It considers the type of weapon and ammunition, number of rounds fired, range attributes such as size and barriers, metrics, time of day weapons are used, and the directivity of both muzzle blast and projectile.
- PEAKEST is the computer model used to predict the peak sound levels (Pk) produced by small arms blast noise.
- BNOISE2 calculates and portrays noise level contours for C-weighted long-term single events for large-caliber weapons. It considers the weapon, ammunition, rounds fired, time of day fired, range size, and direction of both the muzzle and projectile.
- NOISEMAP is used to generate noise level contours in DNL around an airfield. The model uses the aircraft type and number; the takeoffs, landings, touch and goes, as well as closed patterns;

and time of operation to depict long-term fixed-wing and rotary-wing noise levels at an airfield (USACHPPM 2006c).

All of these models are used to characterize the noise environment found within and adjacent to an active Installation such as Fort Benning.

Noise Perception. When hearing noise, the reactions of people can be affected by a number of variables:

- intensity (how loud the noise is);
- duration (does it last a second or an hour);
- repetition (does it occur every day or once a month);
- abruptness of the onset or stoppage of the noise (does it startle or come about at unpredictable times);
- background noise levels (does the person hearing the noise live in an urban or rural environment);
- interference with activities (does it interrupt phone conversations, listening to the radio or television);
- previous community experience with the noise (some neighbors may be new or have lived there for most of their lives);
- time (does noise occur in the middle of the day or night);
- fear of personal danger from the noise sources (can the noise be associated with ammunition escaping from the Installation boundary); and
- extent that people believe the noise can be controlled (USACHPPM 2006b).

All of these factors play into how annoyed the community may feel at any one time when noise is generated at an Installation like Fort Benning. To assist the community in land-use planning and zoning, the Army uses planning zones where noise levels are separated into four categories associated with noise level contours: Land Use Planning Zone (LUPZ), Zone I, Zone II, and Zone III. The paragraphs below and Table 4.8-2 present these zones and the types of activities that are considered compatible within these zones (USACHPPM 2006b).

Table 4.8-2: Zone and Compatibility

Zone	Decibel A-weighted/C-weighted/Peak	Compatibility Level
LUPZ	60 to 65 dBA / 57 to 62 dBC	Compatible
I	<65 dBA / <62 dBC	Compatible
II	65 to 75 dBA / 62 to 70 dBC / 87 PK	Normally Incompatible
III	>75 dBA / >70 dBC / >104 PK	Incompatible

- **LUPZ** – is an area around a noise source which is between 60 dBA or 57 dBC and 65 dBA and 62 dBC. These areas are a buffer in Zone I where the noise could reach Zone II levels during periods of increased operations. This zone is used to provide the community with additional information regarding land use decisions. LUPZ contours for large caliber are generally shown on land use planning noise documents.
- **Zone I** – includes all areas around a noise source in which DNL is less than 65 dBA or 62 dBC. This area is usually suitable for all types of land use activities (e.g., homes, schools, and

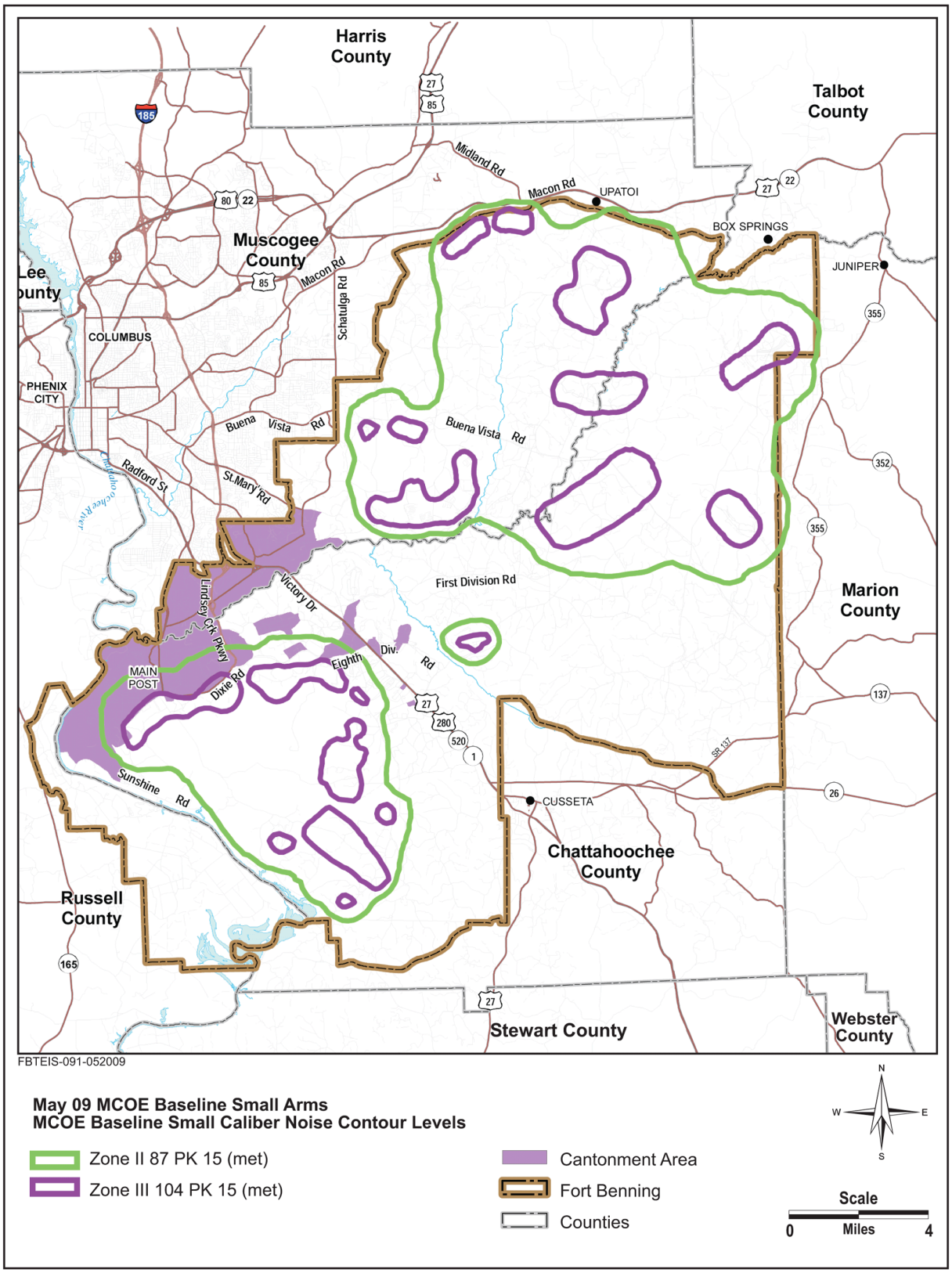
hospitals). Because the LUPZ has a lower limit of 60 dBA or 57 dBC it is being used for analysis purposes in this EIS. Zone I on maps are simply areas that are neither Zone II nor Zone III.

- **Zone II** – consists of an area where the DNL is between 65 and 75 dBA; 62 and 70 dBC; or 87 PK. Exposure to noise within this area is normally incompatible with noise-sensitive land uses and use of the land within the zone should normally be limited to activities such as industrial, manufacturing, transportation, and resource production (e.g., industrial parks, factories, and highways).
- **Zone III** – is an area around the source of noise in which the DNL is greater than 75 dBA, 70 dBC, or 104 PK. The noise level within this zone is considered incompatible with noise sensitive land uses such as churches, schools, parks, playgrounds.

4.8.1 Affected Environment

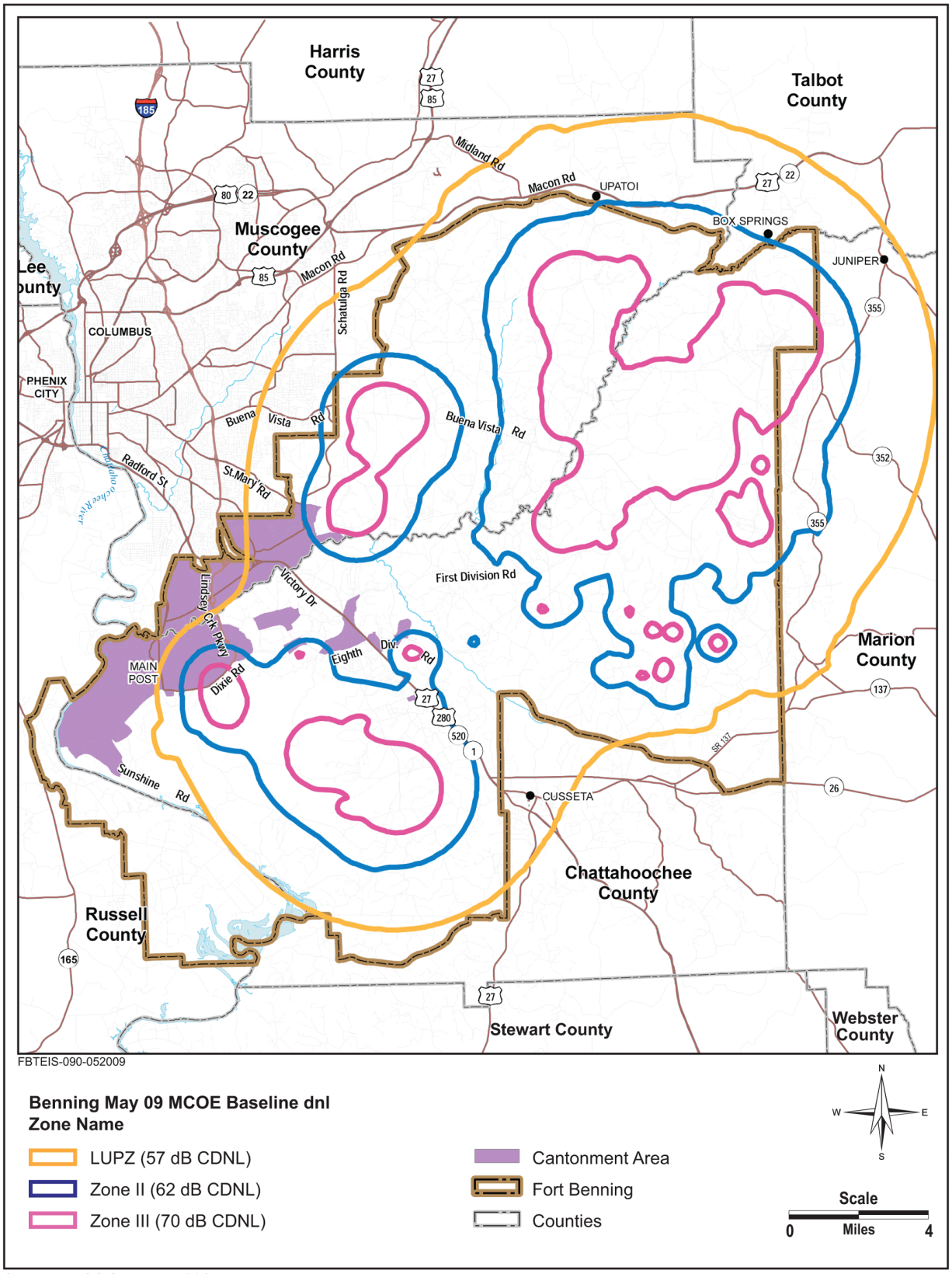
For noise, the baseline conditions found within the ROI includes those areas potentially impacted by noise generated at the Installation from small arms, large caliber, and aircraft operations. For Fort Benning this includes the urban areas of Columbus, GA. The background noise environment in an urban setting includes noise generated on highways, street traffic, police/ambulance sirens, aircraft, construction activities, railroads, and commercial and industrial activities. In small towns around Fort Benning like Buena Vista, Cusseta, Juniper, and Upatoi, the usual background noise includes vehicles, lawn mowers, and aircraft. Rural areas lie to the east, south, and southwest of Fort Benning and consist of residential, undeveloped, and timberland areas. Background noise in these areas would typically consist of vehicles and agricultural equipment. Sensitive receptors adjacent to the Installation generally comprise residential homes.

Noise generated at Fort Benning comes from small-caliber arms weapons firing at .50 caliber and below; large-caliber arms firing from mortar, tank guns, and artillery, as well as pyrotechnical devices (e.g., flares); and rotary and fixed-wing tactical aircraft. Since noise is being generated from three sources (guns, artillery, and aircraft) with vastly different acoustics—small-caliber arms firing, large-caliber weapons use, and aircraft operations—several modeling approaches were used (see discussion above); one set for airfield noise and three sets for small- and large-caliber generated noise. Figures 4.8-1, 4.8-2, and 4.8-3 present the noise levels generated through these various activities and illustrate the general noise environment around the Installation. Unlike topographic contours on a map, noise contours are not intended to be precise representations of noise zones. Geographic features, forest canopy, weather conditions, and the receiver's perception of the source, can influence the impact of noise. Noise contours cannot be so precise as to define one side of a noise contour line as clearly compatible and the other as incompatible. However, the use of noise contour maps has proven to be a reliable planning tool in noise-affected areas throughout the United States (Fort Benning 2004b). Fort Benning Directorate of Training provided USACHPPM with the operational data to create the noise contours and include several new small-arms ranges in the Oscar Complex (see Appendix D for operational data).



Source: USACHPPM 2009.

Figure 4.8-1: Baseline Peak Noise Contour Levels (Pk) Generated from Small-Caliber Weapons



Source: USACHPPM 2009.

Figure 4.8-2: Baseline Noise Contour Levels (CDNL) Generated from Large-Caliber Weapons

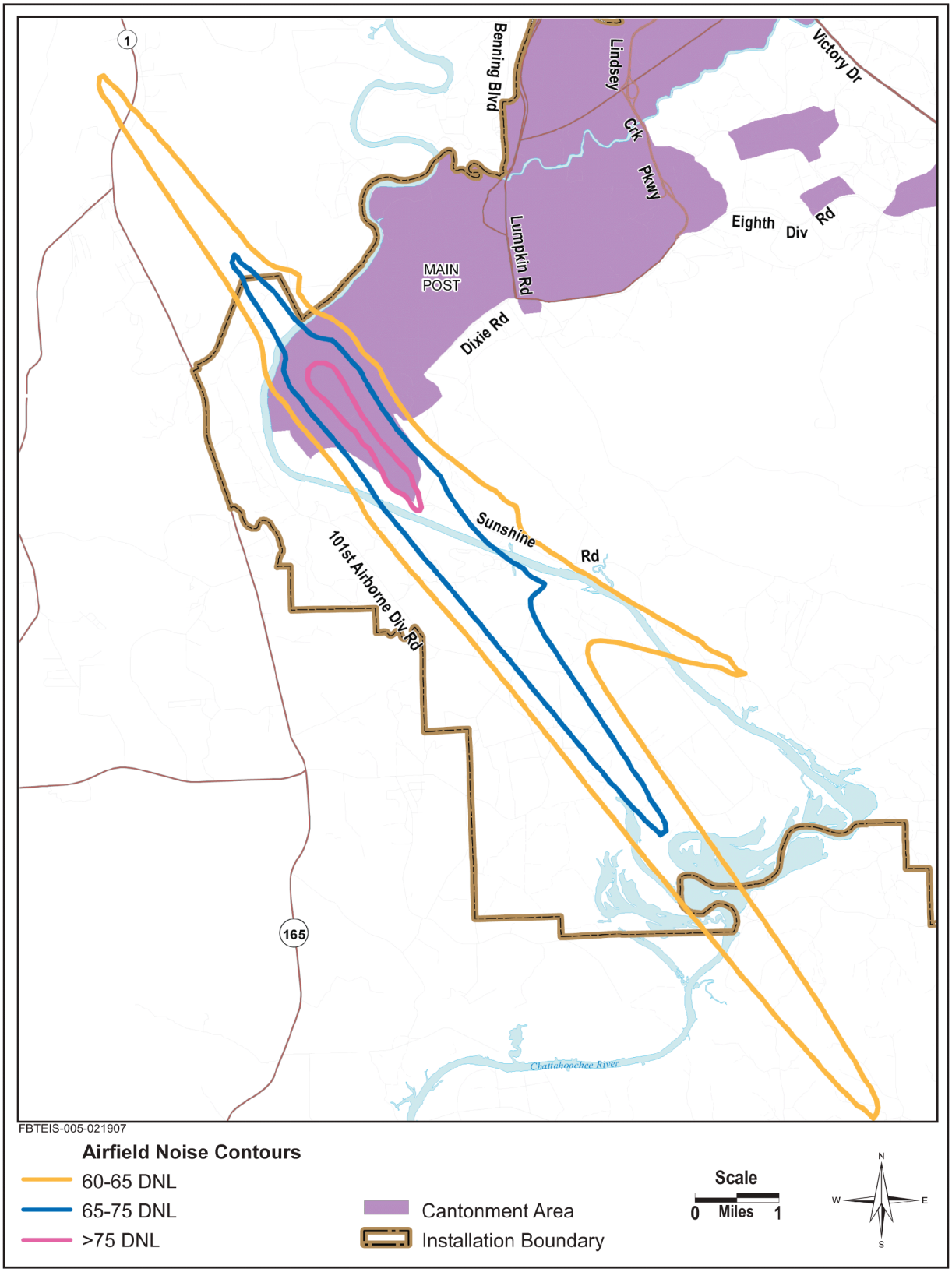


Figure 4.8-3: Baseline Noise Contour Levels (DNL) Generated by Aircraft at Lawson AAF

Lawson AAF noise levels are presented to provide the overall Fort Benning noise environment. Both fixed- and rotary-wing tactical aircraft operate out of Lawson AAF. Fixed-wing aircraft are used for air-borne jump training and helicopters for troop and cargo lift training. Both types fly on established routes and within restricted military airspace. Noise contours associated with Lawson AAF extend off-Post in South Columbus and small portions of Russell, Stewart, and Chattahoochee counties. While encroachment into these areas is minimal at this time, the potential for incompatible uses grows with increased development pressure on these lands. Because the BRAC/Transformation action is spurring growth in communities adjacent to Fort Benning, the importance of continuing existing efforts to work with local governments to plan for compatible development is underscored. None of the MCOE alternatives would change baseline noise condition at Lawson AAF, so that is not carried forward for further analysis.

Table 4.8-3 presents baseline acreage in the off-Post region affected by small-caliber arms noise levels and Table 4.8-4 provides a summary of number of acres within zones from noise generated by large-caliber (heavy) weapons both on and off the Installation. Section 4.5 (Socioeconomics) provides additional analysis of noise effects to environmental justice issues and Section 4.13 (Biological Resources) evaluates potential noise impacts to animals.

Table 4.8-3: Acres within Baseline Small-Caliber Noise Zones (Pk)

Zone	***On-Post Subtotal***	**Off-Post by County**					***TOTAL ACRES***
		Talbot	**Muscogee**	**Marion**	**Chattahoochee**	***Off-Post Subtotal***	
Zone II	**71,878**	0	548	1,156	0	**1,704**	***73,582***
Zone III	**18,124**	0	4	51	0	**55**	***18,179***

Table 4.8-4: Acres within Baseline Large-Caliber Noise Zones (DNL)

Zone	***On-Post Subtotal***	**Off-Post by County**					**TOTAL ACRES**
		Talbot	**Muscogee**	**Marion**	**Chattahoochee**	***Off-Post Subtotal***	
Zone II	**55,292**	766	1,648	5,872	0	**8,286**	***63,578***
Zone III	**36,441**	0	0	960	0	**960**	***37,401***

Under baseline conditions, the same areas and receptors (on- and off-Post) are exposed to noise generated by both small- and large-caliber weapons use. The following provides a description of these areas and the baseline noise conditions.

On-Post, 99 percent of small arms-generated noise Zone III levels occur within Installation boundaries. Under baseline conditions, there are sensitive receptors within this zone (such as residential areas) being exposed to these noise levels. In addition, large-caliber Zone III noise levels from Red Cloud Range fall on-Post.

Off-Post, 55 acres of small-caliber Zone III noise levels fall within Marion and Muscogee Counties. Large-caliber Zone III noise levels are also found in Marion County, overlying 960 acres. Under baseline conditions, there are areas exposed both to large- and small-caliber generated Zone III noise levels.

Currently, planning efforts at Fort Benning associated with noise and adjacent land use compatibility are found primarily in two plans, the Installation Operational Noise Management Plan (IONMP) and a community JLUS. These plans present recommendations to the surrounding counties/municipalities for adopting both a noise disclosure and noise easement ordinance for areas within the LUPZ, Zone II, and Zone III, as well as within a planning area adjacent to the Fort Benning boundary. Such planning efforts encourage the community to adopt ordinances that promote land use that is compatible with the noise produced at Fort Benning, including noise level reduction features in new noise-sensitive buildings (e.g., hospitals). Current planning for the Consolidated Columbus Government and the Unified Chattahoochee-Cusseta Government includes considerations for compatible land use planning within the ROI. Fort Benning's ACUB also addresses land use incompatibilities and noise.

These noise level contours do not necessarily reflect exactly what is heard on a day-to-day basis; however, use of these metrics is the best measurement of the noise environment over time and provides the Army and the community with a management tool for land use development. To help reduce noise impacts on the community, Fort Benning has adopted the following *voluntary* restrictions:

- Firing of weapons .50 caliber or greater is restricted between 12:00 a.m. and 6:00 a.m., exceptions to this rule can only be approved in advance by a Brigade or Regiment Commander (Fort Benning 2004b).
- Units have been directed that the Fort Benning PAO shall be notified of any firing during restricted hours and, in turn, the PAO distributes that information through the local news media, some residents, and local governments.

Fort Benning PAO will continue to notify the public of training activities through public notices issued to media outlets, some residents, and local governments, but will also post this information on a new website at: https://www.infantry.army.mil. While this website is still under construction, it will be accessible to the general public in the late summer of 2009.

A noise complaint system is also maintained at the Installation to address individual concerns. Civilian noise complaints may be reported to Fort Benning by calling the 24-hour Staff Duty Officer. The complaints are relayed to the Environmental Division, as well as to the units who generated the noise and to Installation Command. If needed, investigation and further action follows (Fort Benning 2004b).

4.8.2 Environmental Consequences

Noise impacts result from perceptible changes in the overall noise environment that increase annoyance or affect human health. Annoyance is a subjective impression of noise wherein people apply both physical and emotional variables. To increase annoyance, the cumulative noise energy must increase measurably. Human health effects such as hearing loss and noise-related awakenings can result from noise. For this EIS, noise is evaluated for both construction and weapons activities. It is not anticipated that maintenance activities would noticeably contribute to the noise environment due to their intermittent nature and short duration. The threshold level of significant impacts for noise is:

- The increase due to operations of any Zone III (incompatible) noise contours where there are sensitive noise receptors (e.g., residences, hospitals, libraries, churches). This threshold is intended to capture areas where there would be "high annoyance" effects from operational noise.
- Construction noise resulting in an hourly equivalent sound level of 75 dBA (based on USEPA data for construction noise) at a sensitive receptor (such noise exposure would be equivalent to noise Zone III) or *consistent* exposure to noise levels at 85 dBA, over an 8-hour period, the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (NIOSH 2006).

4.8.2.1 No Action Alternative

Actions described as the preferred alternative in the BRAC/Transformation EIS constitute the No Action Alternative with the exclusion of ranges that were already constructed or anticipated to be in use by the summer of 2008 (these are covered under baseline). To characterize construction activity noise levels, this analysis used USEPA data (USEPA 1971). Noise from construction activity varies with the types of equipment used and the duration of use (Figure 4.8-4). During operation, heavy equipment and other construction activities generate noise levels ranging typically from 70 to 90 dBA at a distance of 50 ft. Commonly, use of heavy equipment occurs sporadically throughout the daytime hours.

Under the No Action Alternative, construction is occurring over a 5-year time frame, during which minimal to negligible impacts (both inside the Installation and outside in adjacent communities) from construction noise would result for the following reasons:

- Heavy equipment that would generate the highest noise levels would not be used frequently enough to exceed the hourly equivalent noise level of 85 dBA for more than 1 hour beyond the boundaries of the Installation.
- Outdoor noise levels at the closest off-Post sensitive receptors—residences in Buena Vista and along Chattsworth Road—would be reduced by approximately 20 dB to 30 dB, respectively, as a result of distance attenuation. Additional attenuation as a result of the terrain would further reduce the effects of construction noise.
- Temporary increases in truck traffic (e.g., dump trucks, fill transports) within and near construction areas would produce localized noise for brief periods, but would not create any significant noise impacts to human health, the neighboring community, or within the Installation.

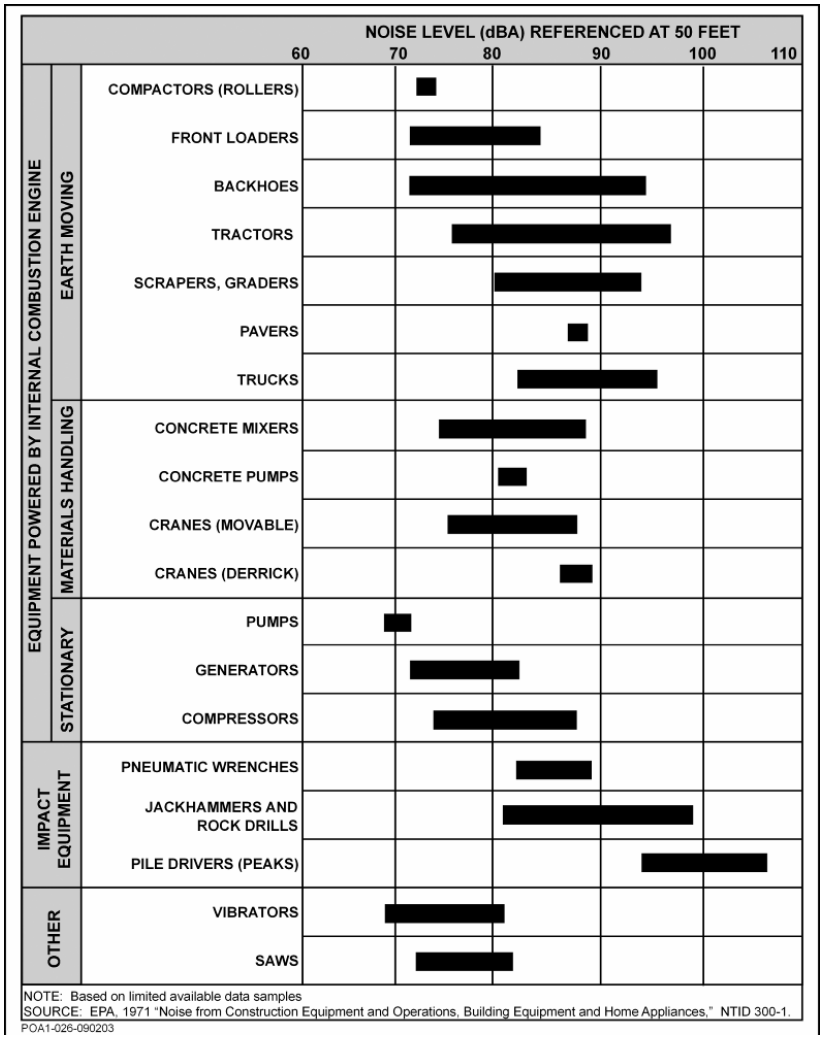


Figure 4.8-4: Common Construction Noise Levels

No Action Alternative Small-Caliber Noise Impacts

On-Post, areas affected by Noise Zone II levels would be reduced by 2 percent (or 1,700 acres), therefore, no changes in impacts when compared to baseline conditions. Zone III noise levels; however, would increase by 17 percent or 3,100 acres (Figure 4.8-5 and Table 4.8-5) creating significant impacts (USACHPPM 2009). The Installation would continue the practice of disclosing this fact in real estate documents to notify on-Post family housing residents and to minimize noise complaints.

Table 4.8-5: No Action Alternative: Acres within Small-Caliber Noise Zones (Pk)

Zone	*On-Post Subtotal*	Off-Post by County					TOTAL ACRES
		Talbot	Muscogee	Marion	Chattahoochee	*Off-Post Subtotal*	
Zone II	**70,418**	0	714	1,156	0	**1,870**	***72,288***
Zone III	**21,225**	0	4	51	0	**55**	***21,280***

Off-Post, there would be a 10-percent increase (or 166 acres) in Zone II noise levels (all of this growth occurring in Muscogee County); while in small-caliber Zone III, there would be no changes in off-Post noise levels (USACHPPM 2009). When compared to baseline conditions, the No Action Alternative would not generate any increased small-caliber Zone III noise levels.

No Action Alternative Large-Caliber Noise Impacts

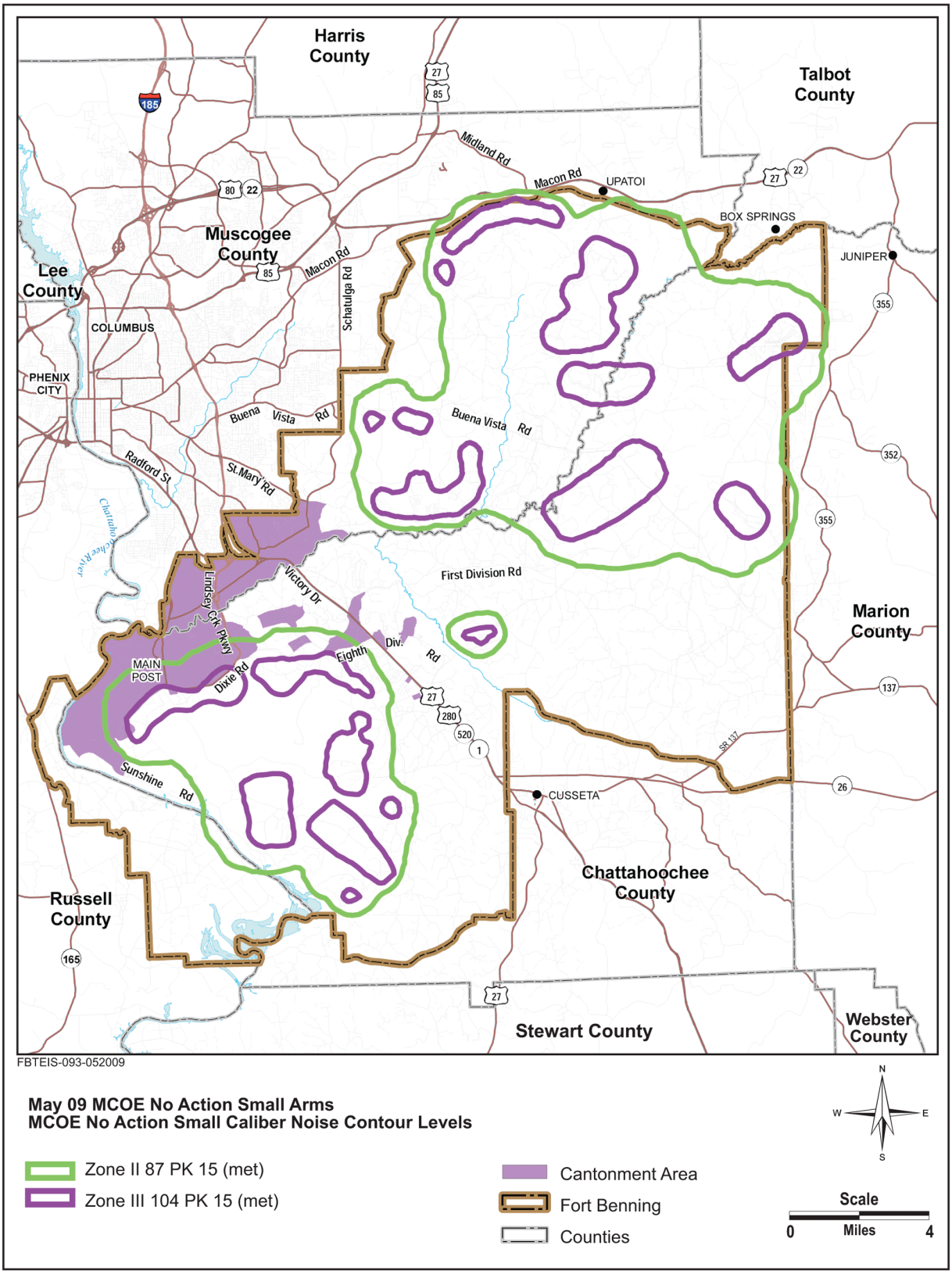
Large-caliber noise levels are presented in Figure 4.8-6 and acreage impacted in Table 4.8-6. The impulse noise they generate was measured using the C-weighted metric (USACHPPM 2009). While the MCOE No Action Alternative basically represents the BRAC/Transformation EIS preferred alternative (i.e., Alternative B), the contours may differ because some ranges that were proposed under the BRAC/Transformation EIS have been built and are accounted for under MCOE baseline conditions.

Table 4.8-6: No Action Alternative: Acres within Large-Caliber Noise Zones (DNL)

Zone	*On-Post Subtotal*	Off-Post by County					TOTAL ACRES
		Talbot	Muscogee	Marion	Chattahoochee	*Off-Post Subtotal*	
Zone II	**57,846**	885	2,243	6,229	0	**9,357**	***67,203***
Zone III	**38,319**	0	0	960	0	**960**	***39,279***

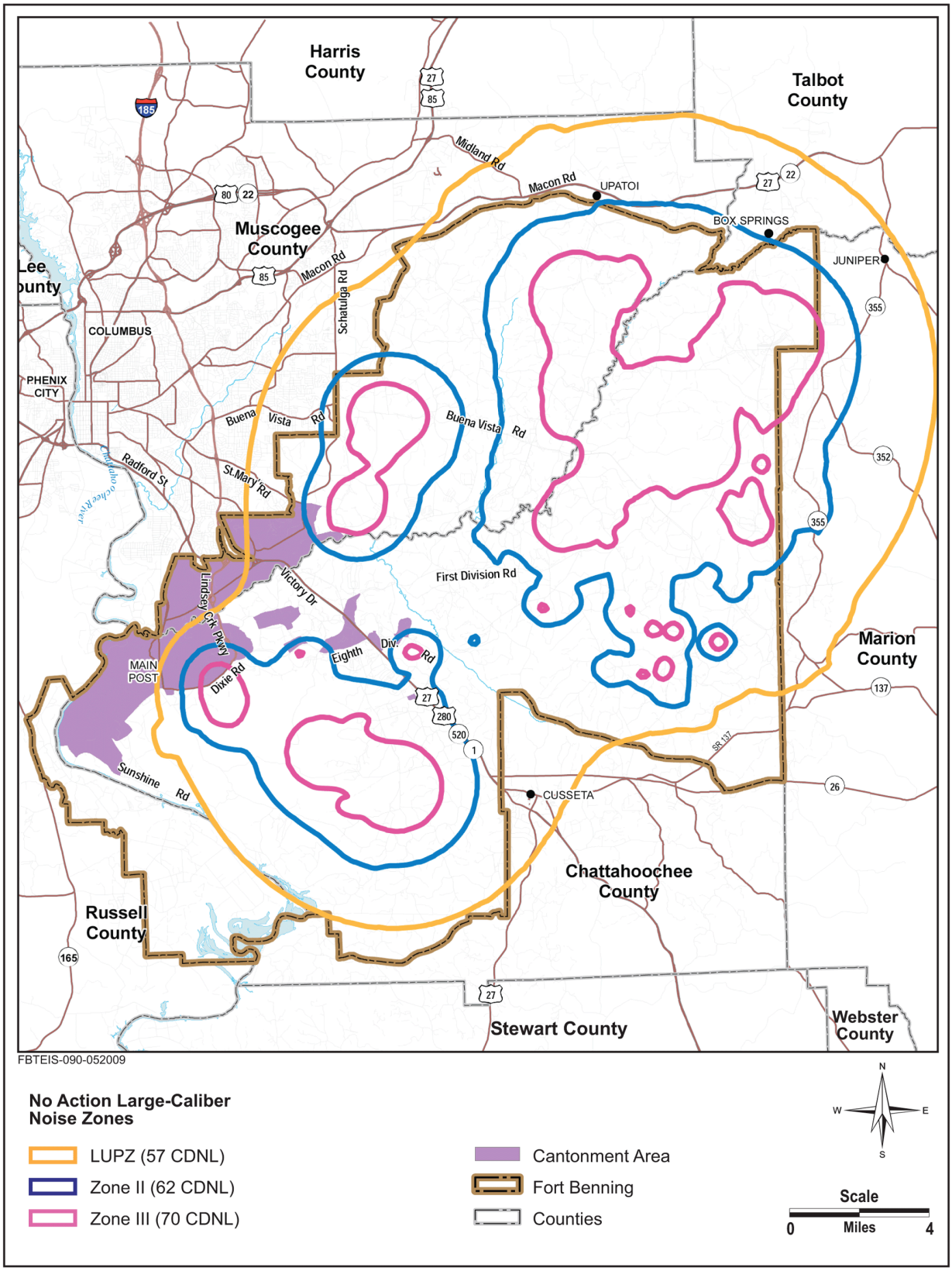
On-Post, there would be significant impacts due to large-caliber Zone III noise levels increasing by 5 percent (or 1,900 acres) and impacting about 96 family housing buildings, which is approximately 192 sets of family quarters (personal communication, Leeder 2009 and USACHPPM 2009). When compared to baseline, this would be a significant impact. On-Post Zone II noise levels would increase as well, close to 2,600 more acres (or 5 percent) would be affected under the No Action Alternative when compared to baseline. BOLC training is required to occur between the hours of 0400 hours (4:00 am) to 2400 hours (midnight) for half of the training days and between 0600 (6:00 am) to 2400 hours (midnight) for the remainder of the training days and will follow the night-time training voluntary restrictions.

As mentioned above, there would be increases in on-Post, large-caliber Zone III noise levels generated at Red Cloud Range. These Zone III noise levels would affect approximately 96 family housing buildings creating significant impacts. Fort Benning would continue to work with RCI program representatives to minimize these impacts. In addition, the on-going practice of including noise disclosures in real estate documents to on-Post family housing residents in Zone II or III areas would continue to minimize noise complaints.



Source: USACHPPM 2009.

Figure 4.8-5: Small-Caliber Noise Levels (Pk) under the No Action Alternative



Source: USACHPPM 2009.

Figure 4.8-6: Large-Caliber Noise Levels (CDNL) under the No Action Alternative

Off-Post, Talbot County would experience 16-percent (119 acres) growth in Zone II noise levels, Muscogee Zone II noise levels would increase by 595 acres, and in Marion County they would grow by 357 acres; there would be no changes in Chattahoochee County when compared to baseline conditions. In total, there would be an approximate 6-percent increase in off-Post areas affected by Zone II noise levels; there would be no changes in Zone III noise levels. A brief discussion of off-Post areas exposed to Zone II and III follows:

- Western Marion County Area: According to land cover data, lands are primarily used for agriculture and forestry. Sensitive land uses in this part of the county are widely dispersed rural residences and churches.
- Southwestern Talbot County/Eastern Columbus Panhandle: Land cover in this area is primarily forested, with some development associated with the roadways (see Figure 4.3-3). Under the No Action Alternative, portions of this area experience Noise Zone II levels. Noise sensitive land uses include rural residences and churches.
- Eastern Muscogee County-Chattsworth Road Area: This area includes low-density and medium-density residential land uses (normally incompatible with Noise Zone II), commercial land uses, industrial, and some undeveloped land uses that are typically compatible with Noise Zone II areas.

Similar to baseline conditions, the No Action Alternative large-caliber Zone II noise levels would occur both on- and off-Post; it is anticipated that residential areas outside Installation boundaries would continue experiencing annoyance with these noise levels.

As far as Zone III noise levels are concerned, conditions off-Post within Marion County would not change from baseline conditions; the same sensitive receptors significantly impacted under baseline conditions would continue to be affected by large-caliber Zone III noise levels. Fort Benning would continue to communicate with the media, some residents, and the local government, as well as post training schedules on a newly constructed website to better inform the public. In addition, Fort Benning recommends that land use planners, real estate brokers, developers, and residential property owners include noise disclosures in real estate documents to address noise in Zones II and III. The practice of disclosing to off-Post residents the fact they are located in Zones II or III could minimize potential noise complaints.

4.8.2.2 Noise Impacts under Alternative A (preferred alternative)

Discussion of noise impacts is organized in the following manner: 1) construction noise impacts for Alternatives A and B would not differ from that presented under the No Action Alternative; therefore, please refer to Section 4.8.2.1 for discussion of these impacts and 2) noise generated from both small- and large-caliber weapons would differ between Alternatives A and B due to the location and number of the ranges proposed under each alternative and are presented separately below.

Alternative A (preferred alternative) Small-Caliber Noise Impacts

On-Post, Zone II noise levels would decrease when compared to baseline; however, Zone III levels would increase by about 11 percent (Figure 4.8-7 and Table 4.8-7). While there are increases in Zone III, the growth in this noise zone occurs predominantly outside cantonment areas and would not introduce any new incompatibilities with sensitive noise receptors. In conclusion, noise generated on-Post by small-caliber weapons would be significant under preferred Alternative A.

Table 4.8-7: Alternative A: Acres within Small-Caliber Noise Zones (Peak)

Zone	*On-Post Subtotal*	Off-Post by County					TOTAL ACRES
		Talbot	Muscogee	Marion	Chattahoochee	*Off-Post Subtotal*	
Zone II	**69,621**	0	732	1,042	0	**1,774**	***71,707***
Zone III	**23,893**	0	5	50	0	**55**	***23,948***

Off-Post, implementation of preferred Alternative A would result in an increase of 74 acres in off-Post Zone II noise levels. For Zone III noise levels, there would be a 1-acre increase in Muscogee County and a decrease of 1 acre in Marion County; however, no new sensitive receptors would be affected to introduce significant impacts when compared to baseline conditions.

Alternative A (preferred alternative) Large-Caliber Noise Impacts

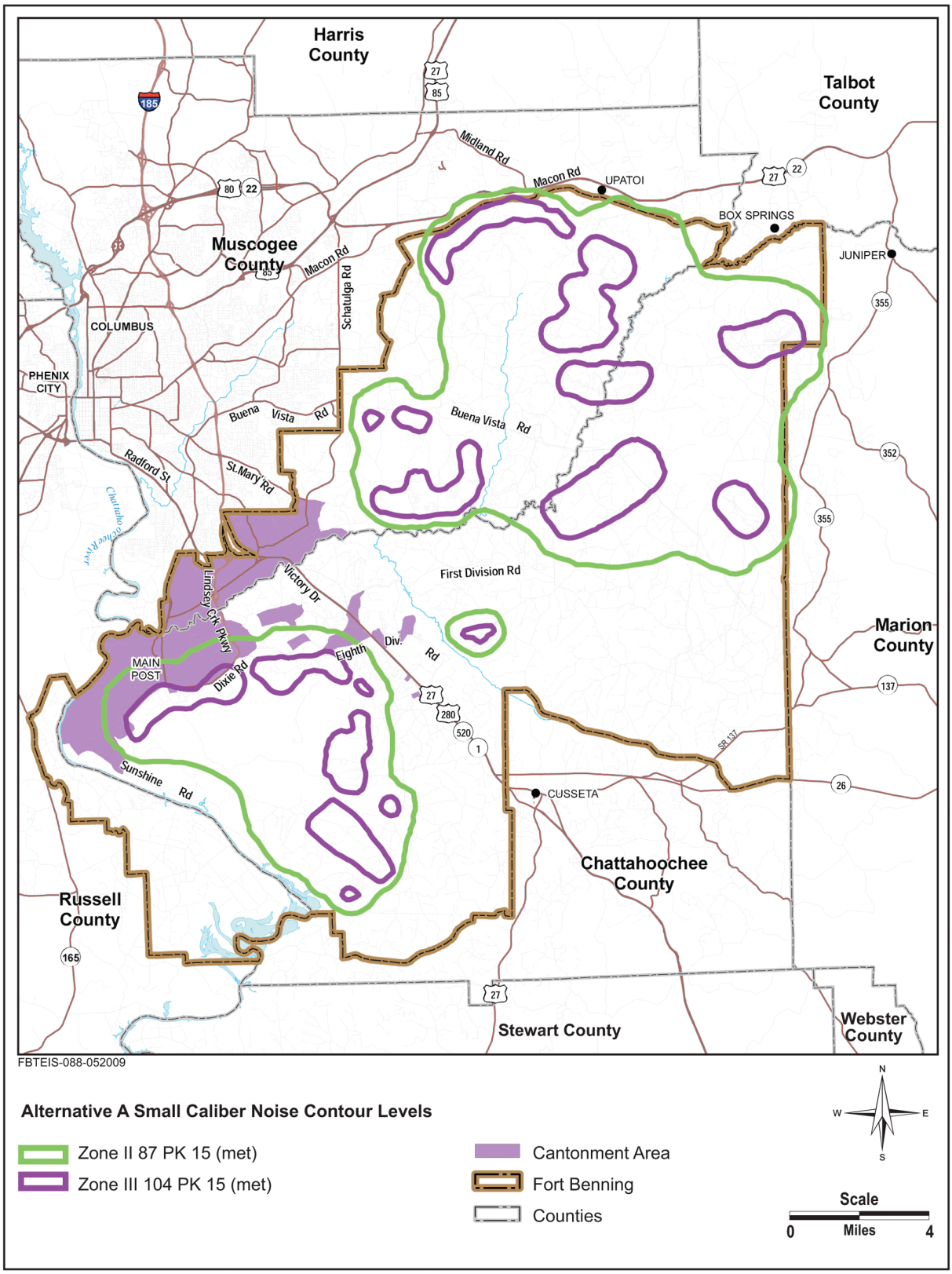
On-Post large-caliber Zone II noise levels would increase under Alternative A (Figure 4.8-8 and Table 4.8-8) by 2,155 acres (or 4 percent) when compared to baseline conditions; Zone III on-Post noise levels increase by 3,015 acres (or 8 percent). Approximately 96 family housing buildings would be in Zone III.

Off-Post Zone II levels increase by close to 1,860 acres (or 23 percent); large-caliber Zone III off-Post noise levels increase in Marion County by close to 150 acres (or 16 percent) when compared to baseline. This increase would introduce significant impacts because there would be an increase in the number of sensitive noise receptors exposed.

In summary, there would be potential significant noise impacts on- and off-Post if Alternative A were implemented.

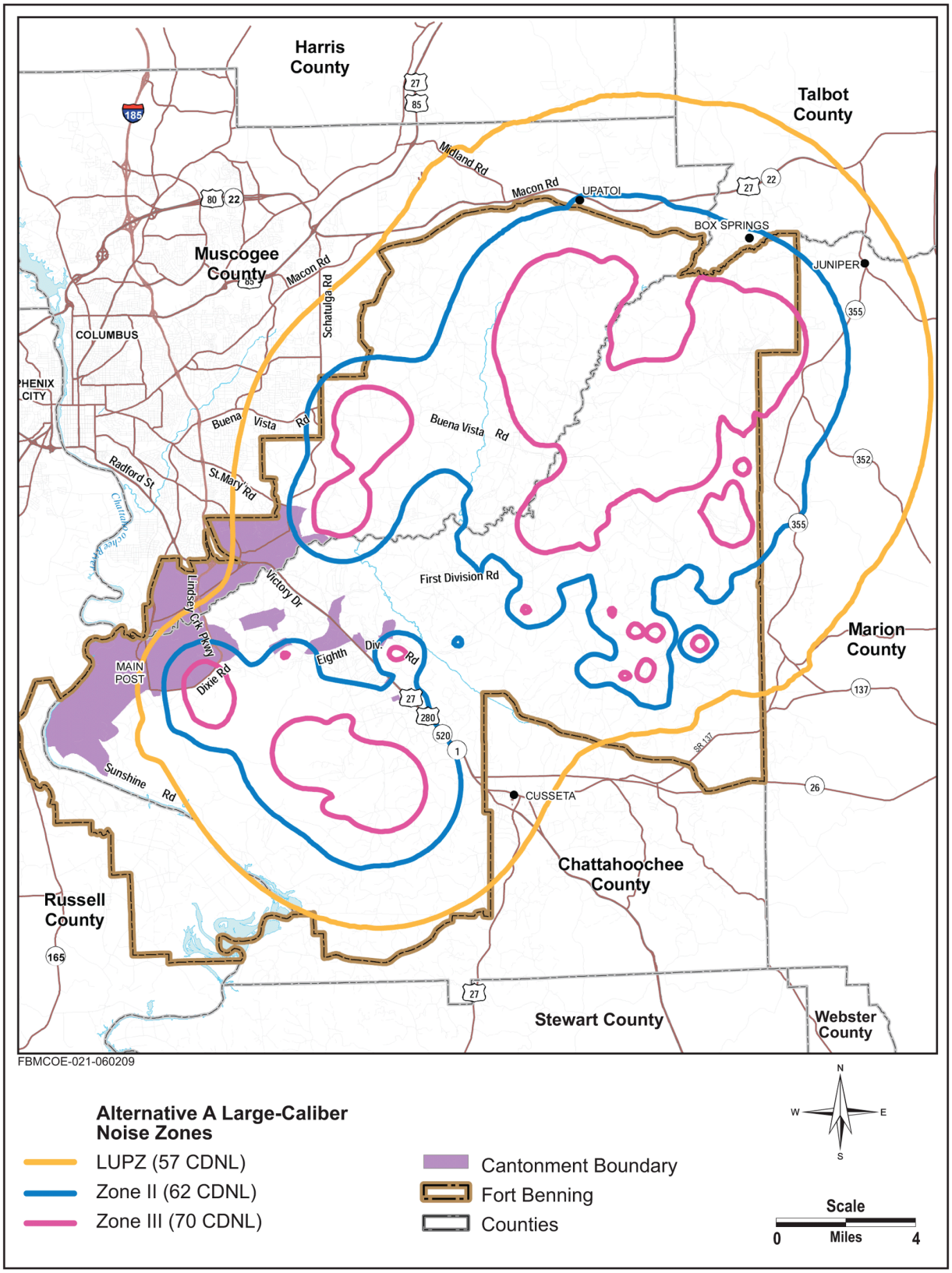
Table 4.8-8: Alternative A: Acres within Large Caliber Noise Zones (DNL)

Zone	*On-Post Subtotal*	Off-Post by County					TOTAL ACRES
		Talbot	Muscogee	Marion	Chattahoochee	*Off-Post Subtotal*	
Zone II	**57,447**	1,152	2,380	6,613	0	10,145	***67,592***
Zone III	**39,456**	0	0	1,109	0	1,109	***40,565***



Source: USACHPPM 2009.

Figure 4.8-7: Alternative A Projected Noise Levels (Pk) Generated from Small-Caliber Weapons



Source: USACHPPM 2009.

Figure 4.8-8: Alternatives A Projected Noise Levels (CDNL) Generated from Large-Caliber Weapons

4.8.2.3 Noise Impacts under Alternative B

Alternative B Small-Caliber Noise Impacts

On-Post, small-caliber Zone II noise levels would decrease when compared to baseline (by 4 percent) conditions (Table 4.8-9 and Figure 4.8-9). When compared to baseline conditions (refer to Table 4.8-3), on-Post Zone III noise levels would be similar to Alternative A.

Table 4.8-9: Alternative B: Acres within Small-Caliber Noise Zones (Peak)

Zone	*On-Post Subtotal*	Off-Post by County					TOTAL ACRES
		Talbot	Muscogee	Marion	Chattahoochee	*Off-Post Subtotal*	
Zone II	**69,309**	1	732	1,065	0	**1,798**	***71,107***
Zone III	**24,401**	0	0	5	0	**5**	***24,406***

Off-Post, Alternative B small-caliber noise levels would be similar to Alternative A. When compared to baseline, there would be 184 more acres in Muscogee County exposed to Zone II noise levels but in Marion County there would be a decrease of 114 acres. For Noise Zone III levels, there would be 46 fewer acres exposed in Marion County when compared to baseline conditions. Additional sensitive noise receptors would be exposed to small-caliber Zone III noise levels in Muscogee County; therefore, significant impacts are anticipated off-Post if Alternative B were implemented.

Alternative B Large-Caliber Noise Impacts

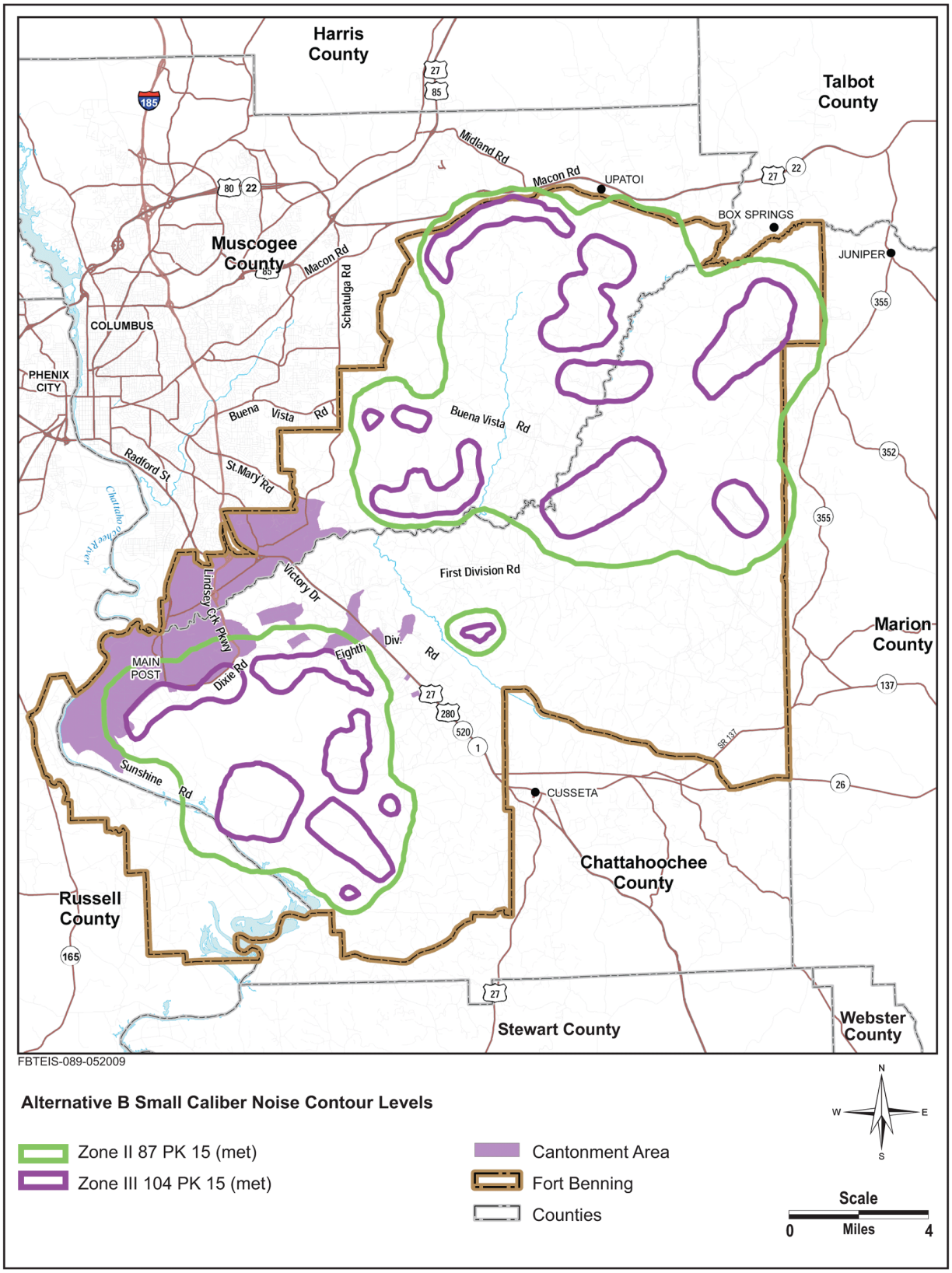
On-Post, Alternative B large-caliber Zone II noise levels (Table 4.8-10 and Figure 4.8-10) would increase by about 365 acres (or 1 percent) when compared to baseline conditions. Large-caliber Zone III noise levels would also increase on-Post by 4,955 acres (or 14 percent). Similar to Alternative A, large-caliber Zone III noise levels would impact approximately 96 family housing buildings.

Table 4.8-10: Alternatives B: Acres within Large-Caliber Noise Zones (DNL)

Zone	*On-Post Subtotal*	Off-Post by County					TOTAL ACRES
		Talbot	Muscogee	Marion	Chattahoochee	*Off-Post Subtotal*	
Zone II	**55,656**	1,395	2,393	6,907	0	**10,695**	***66,351***
Zone III	**41,366**	15	0	461	0	**476**	***40,514***

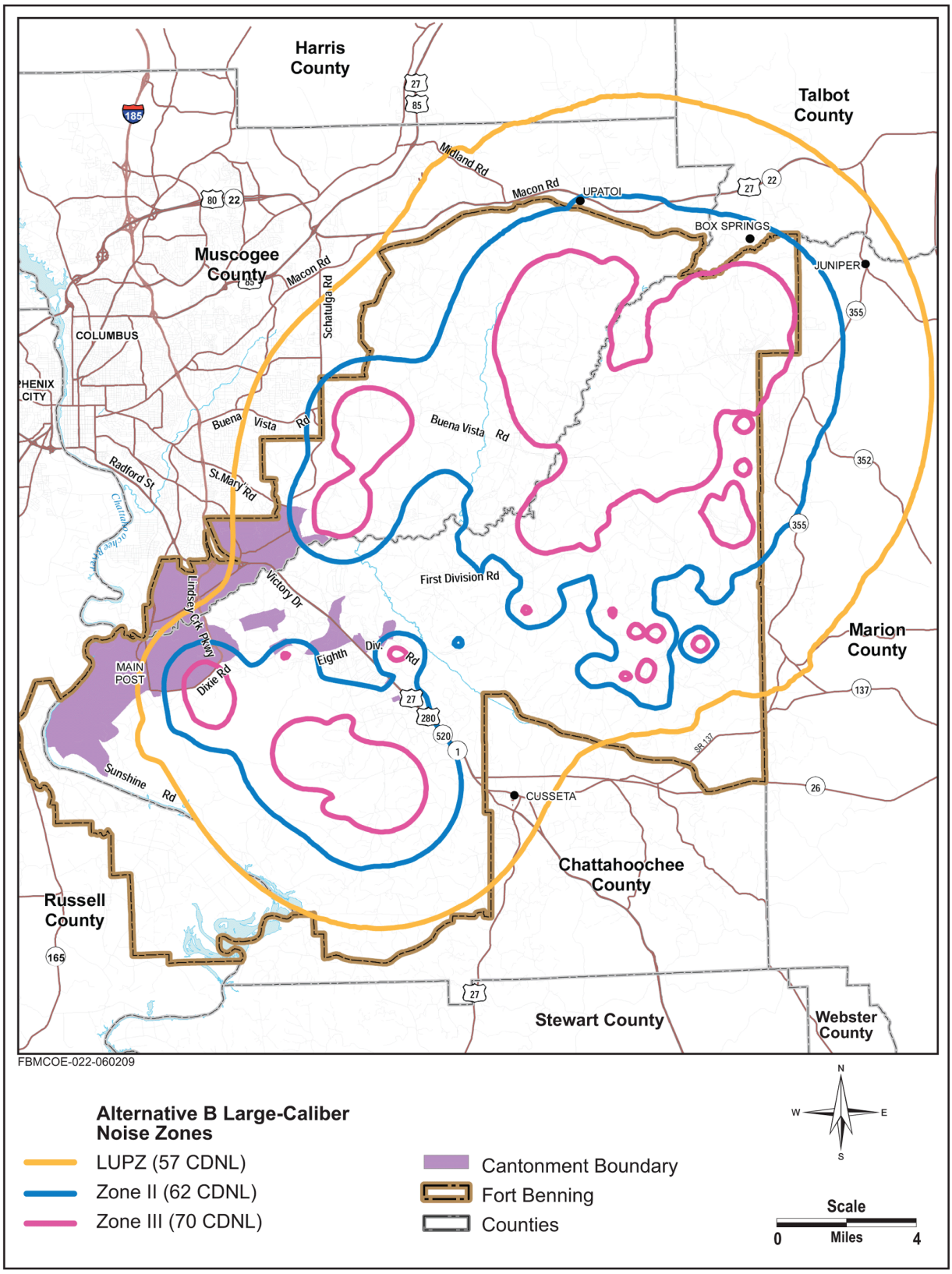
Off-Post, when compared to baseline, Alternative B large-caliber Zone II noise levels would grow by about 2,445 acres (or 29 percent). Zone III noise levels would decrease by 480 acres (or 50 percent) and would not impact new sensitive noise receptors.

In summary, when compared to baseline conditions, Alternatives A and B Zone III noise contours would expand and new sensitive receptors would be exposed. Significant noise impacts would be expected if either action alternative were implemented.



Source: USACHPPM 2009.

Figure 4.8-9: Alternative B Projected Noise Levels (Pk) Generated from Small-Caliber Weapons



Source: USACHPPM 2009.

Figure 4.8-10: Alternatives B Projected Noise Levels (CDNL) Generated from Large-Caliber Weapons

To readily make impact comparisons among baseline, No Action, Alternative A, and Alternative B conditions, Tables 4.8-11 and 4.8-12 present on- and off-Post large-caliber noise levels.

Table 4.8-11: On-Post Large Caliber Noise Zones (CDNL): Comparison of Baseline, No Action and Alternatives A and B (Acres)

	Baseline	No Action	Alternative A	Alternative B
Zone II	55,292	57,846	57,447	55,656
Zone III	36,441	38,319	39,456	41,336

Table 4.8-12: Off-Post Large Caliber Noise Zones (CDNL): Comparison by County of Baseline, No Action, and Alternatives A and B (Acres)

	Baseline	No Action	Alternative A	Alternative B
Talbot				
Zone II	766	885	1,152	1,395
Zone III	0	0	0	15
Muscogee				
Zone II	1,648	2,243	2,380	2,393
Zone III	0	0	0	0
Marion				
Zone II	5,872	6,229	6,613	6,907
Zone III	960	960	1,109	461

4.8.3 Mitigation Measures

For on- and off-Post sensitive receptors in Zone II, facility siting and design standards for noise reduction could attenuate noise levels. For off-Post communities, Fort Benning recommends that land use planners, real estate brokers, developers, and residential property owners include noise disclosures in real estate documents to address noise in Zones II and III.

On-Post, Fort Benning is working with the RCI program representatives to determine the most feasible mitigation options to mitigate significant noise impacts. Mitigation measures that could minimize noise impacts include, but are not limited to, retrofitting residences with noise-attenuating materials, demolishing and rebuilding residences in other locations, or changing the type of training that occurs adjacent to this housing area. As appropriate, Fort Benning will prepare separate NEPA documentation regarding noise impacts and mitigation options for family housing.

Off-Post, while significant impacts are anticipated, continued use of the noise complaint process would assist Fort Benning in responding to noise complaints in a timely manner. Fort Benning also plans on posting training information on a new website at: https://www.infantry.army.mil. While this website is still under construction, it will be accessible to the general public in the late summer of 2009. In addition, Fort Benning's IONMP includes outreach programs to achieve the maximum feasible compatibility between the noise environment and noise-sensitive land uses both on- and off-Post. The plan is meant to inform the community of the surrounding noise environment and suggest compatible land uses for development within these areas. To mitigate noise complaints and conflicts, Fort Benning also recommends to communities the practice of disclosing to residents the fact they are located in Zones II or III.

4.9 AIR QUALITY

In this EIS, air emissions would be generated as a result for the Proposed Action activities and include construction which is, by definition, temporary in nature and initiated to support the Proposed Action on the Installation, and permanent operational and maintenance activities that are undertaken to support the Proposed Action once it has been established at Fort Benning.

4.9.1 Affected Environment

This section presents the baseline conditions for air quality. The ROI for air emissions associated with the Proposed Action includes the City of Columbus and counties of Chattahoochee and Muscogee, GA; as well as Phenix City and Russell County, AL. This ROI is the Columbus, GA-AL metropolitan statistical area (MSA) and is the same area the USEPA has used for the purposes of the National Ambient Air Quality Standards (NAAQS) regional air quality program. Although the ROI does follow the regulatory definition (i.e., the MSA used for NAAQS) include Alabama, the actual activities evaluated in this air quality analysis will only occur within that portion of Fort Benning that is found in Georgia. The Installation is considered a major source of air emissions and falls under Title V of the Clean Air Act Amendments (CAAA) because it has the potential to emit more than 100 tons per year (tpy) of one criteria pollutant—as is the case with Fort Benning—or 10 tpy of any one hazardous air pollutant (HAP); or 25 tpy of total combined HAPs.

4.9.1.1 Ambient Air Quality Conditions

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The CAA and its subsequent amendments (CAAA) established the NAAQS for six "criteria" pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns (PM_{10}), $PM_{2.5}$, and lead (Pb). These standards (Table 4.9-1) represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. The GEPD adopted the NAAQS as the standards for the state.

Table 4.9-1: Georgia and National Ambient Air Quality Standards[a]

POLLUTANT	AVERAGING TIME	PRIMARY[b]	SECONDARY
Ozone (O_3)	8 Hours	0.075 ppm	Same as Primary
Carbon Monoxide (CO)	8 Hours	9.0 ppm	None
	1 Hour	35 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm	Same as Primary
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.03 ppm	None
	24 Hours	0.14 ppm	
	3 Hours	---	0.5 ppm
Particulate Matter (PM_{10})	24 Hours	150 $\mu g/m^3$	Same as Primary
Particulate Matter ($PM_{2.5}$)	Annual	15 $\mu g/m^3$	Same as Primary
	24 Hours	35 $\mu g/m^3$	---
Lead (Pb)	Quarterly Arithmetic Mean	1.5 $\mu g/m^3$	Same as Primary

Notes: a: These standards, other than for ozone and those based on annual and quarterly averages, must not be exceeded more than once per year (40 CFR 51). The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.
b: ppm = parts per million by volume, $\mu g/m^3$ = micrograms per cubic meter.

Although the larger MSA is presently designated by USEPA as in attainment for all criteria pollutants, there is a portion of Muscogee County that is classified as a maintenance area for lead. This classification is due to a lead smelting and battery production facility (GNB Industrial Power Inc.) and the area is defined within a radius of 2.3 kilometers of the facility's center. Because Fort Benning does not fall within this radius, and there is no substantial source of lead emissions associated with the Proposed Action, lead emissions are not further considered in this air quality analysis. Table 4.9-2 presents total annual baseline emissions of criteria pollutants for the ROI.

Table 4.9-2: Total Baseline Pollutant Emissions (tons/year)[a]

	CO	*VOCs*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
MSA Emissions	104,634	16,139	14,926	3,500	13,201	4,001

Source: [a] USEPA 2005. Air Data Tier Emissions Report, the most recent data available are from 2001.

A locality's air quality status and the stringency of air pollution standards and regulations depend on whether monitored pollutant concentrations attain the levels defined in the NAAQS. Ambient air quality concentrations are expressed in ppm or $\mu g/m^3$, but the standards used for describing existing and proposed air emissions are expressed in tons per year. Areas with ambient concentrations less than these levels are in "attainment" and areas that exceed these standards are classified in "nonattainment." The Fort Benning area is currently in attainment for all criteria pollutants. Please note that the USEPA (in October 2006) promulgated new fine particulate matter standards, revising the 1997 standards—reducing the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. In December 2007, GEPD submitted their recommendations for PM $_{2.5}$ 24-hour nonattainment designation and then submitted a revised list in May 2008. This revision concluded that all counties within Georgia were in attainment or unclassified (USEPA 2009); in December 2008, USEPA concurred with these designations. In Alabama, the situation is similar; the state submitted their recommendations for counties in nonattainment in November 2007.

The USEPA concurred in August 2008 that with the exception of Jefferson, Shelby, and Walker Counties, all other counties were in attainment or unable to be classified (USEPA 2009); none of these three are within the affected environment (see Appendix E for the states' $PM_{2.5}$ recommendations).

In addition, USEPA promulgated the reduced ozone standard of 0.075 ppm in March 2008. To meet this 2008 ozone standard, states were given 1 year to evaluate air quality vis-à-vis ozone and its precursor pollutants—NO_x and volatile organic compounds (VOCs)—and make attainment and nonattainment recommendations. Both Georgia and Alabama submitted their recommendations to USEPA in March 2009. Muscogee County is the only county recommended for ozone nonattainment, and a portion of Fort Benning is within Muscogee County (Appendix E provides the states' ozone recommendations). If these recommendations are accepted by USEPA, and Muscogee County is designated in nonattainment, Georgia will have to prepare an ozone State Implementation Plan (SIP) (USEPA 2009).

4.9.1.2 Installation Air Pollutant Emissions

As was mentioned above, Fort Benning is a major source for air emissions under 40 CFR Part 70 for the following pollutants: CO, NO_x, SO_2, VOC, $PM_{10}/PM_{2.5}$, individual HAP, and total HAPs. The major source designation also requires Fort Benning to comply with the CAA Part 70 Operating Permit Regulations (Fort Benning 2008), usually referred to as "Title V". Fort Benning received its renewed Title V permit (Permit No.: 9711-215-0021-V-02-0) on August 8, 2008. The "major source" designation triggers the provisions of 40 CFR 52.21, *Prevention of Significant Deterioration (PSD).* Fort Benning falls under one of the 28 named source categories under PSD regulations because the facility currently has a combined (fossil fuel) boiler capacity over 250 million (MM) British Thermal Units per hour (Btu/hr) heat input capacity. The facility is currently a major source under PSD regulations because it's potential-to-emit (PTE) for NOx, CO, VOCs, $PM_{10}/PM_{2.5}$, and SO_2 is greater than 100 tpy for each. The facility has never undergone a PSD review but has avoided PSD by accepting limits.

Under Title V, any on-Post stationary equipment that emits criteria pollutants and/or HAPs must obtain a permit in order to be constructed and operated. Examples of HAPs include xylene, toluene, and hexane. The permit includes a list of the applicable regulations, the emissions limits, and specifies how equipment is to be operated to minimize emissions. Equipment and/or activities that emit HAPs at the Installation include:

- Boilers
- Firefighting Equipment
- Fuel Storage Tanks and Fuel Dispensing
- Internal Combustion Engines
- Landfills
- Parts Cleaners/Ovens
- Spray Paint Booths, Paint Stripping/Removal, Chemical Paint
- Range Operations
- Rock Crusher
- Veterinary Crematory
- Wood Chipper
- Woodworking

On-Post personnel operating this equipment must satisfy monitoring and record-keeping requirements of the permit. USEPA and GDEP make regular Installation site visits to perform inspections of records and equipment.

In addition to these stationary source emissions, Fort Benning generates air pollutants from prescribed fire activities as part of their ongoing ecosystem management program. It is required as part of the recovery strategy for the federally-listed RCW and historical evidence indicates that prescribed fire reduces wildfires and therefore reduces unmanaged air emissions. Area source emissions from prescribed fire are the largest single source of criteria pollutant emissions on the Installation. Table 4.9-3 presents the actual criteria pollutant emissions for Fort Benning for the year 2006.

Table 4.9-3: Fort Benning 2006 Criteria Pollutant Emissions (tons/year)[a]

	CO	***VOCs***	***NO_x***	***SO_x***	***PM_{10}***	***$PM_{2.5}$***
Fort Benning Stationary Sources	14.84	14.64	6.20	0.11	2.25	<2.25[b]

Notes: [a]2006 Air Emissions Inventory (Fort Benning 2007a).
[b]$PM_{2.5}$ was not measured in the 2006 Emission Inventory; $PM_{2.5}$ is a subset of PM_{10}.
Prescribed fire emissions not included in above table.

4.9.2 Environmental Consequences

The assessment of impacts to air quality is based on comparing the baseline use and conditions (discussed above) to proposed changes associated with the alternatives (Alternatives A, B, and the No Action Alternative). The key difference between Alternatives A and B in terms of air quality is the amount of land disturbance that would occur between the two alternatives. Alternative A would result in the impact of approximately 10, 045 acres of land while Alternative B would impact approximately 24,596 acres with the potential associated dust emissions being greater for Alternative B both during construction and during training operations. In either case, construction-related BMPs would be used to reduce these impacts but the relative difference in potential impacts is clear. Since the changes to Alternative A primarily involved changes to reduce impacts to the Red-cockaded Woodpecker and did not involve industrial changes or major building changes, other similarities to Alternative B remain the same. The potential impacts to air quality due to increases in personnel moving to Fort Benning and commuting in the area was analyzed in the BRAC/Transformation EIS at Appendix E, Sections 4.8.2, and 4.15.5.7. The resulting analysis indicated that overall and cumulative air impacts would not be significant. Relatively few people are expected to move to Fort Benning solely due to the MCOE proposed action; therefore, no impacts are expected from the additional personnel moving to Fort Benning for any alternative above those identified in the BRAC/Transformation EIS. Therefore, the analysis described below applies to both alternatives, unless otherwise specified. The analysis compares current air emissions with projected emissions that include construction, operations, and maintenance, to determine potential impacts.

Air quality impacts would be significant if emissions associated with the Proposed Action would: 1) increase ambient air pollution concentrations above the NAAQS; 2) contribute to an existing exceedance of the NAAQS; 3) interfere with, or delay timely attainment of the NAAQS; 4) impair

visibility within federally-mandated PSD Class I areas; or 5) result in the potential for any stationary source to be considered a major source of emissions as defined in 40 CFR 52.21 (total emissions of any pollutant subject to regulation under the CAA greater than 250 tpy for attainment areas).

The closest PSD Class I areas are the Sipsey Wilderness Area, AL as well as Cohotta, Wolf Island, and Okefenokee Wilderness Areas, GA. All of these Class I areas are located more than 200 miles away and it would be unlikely that they would be affected by emissions generated at Fort Benning; therefore, PSD is not further considered in this air quality analysis. Prescribed fire would not change as a result of implementing the Proposed Action, so prescribed fire emissions would not differ from those currently generated and is not evaluated further in this EIS.

4.9.2.1 No Action Alternative

The No Action Alternative would be continuing the present course of action, which represents the continued implementation of BRAC/Transformation EIS (USACE 2007a). Air emissions for multiple years under the No Action Alternative are presented in Table 4.9-4 and represent construction emissions due to BRAC/Transformation actions. In the year in which the highest amount of emissions are generated (i.e., 2009), the regional contribution for any single criteria pollutant is still less than 2 percent of regional emissions; therefore, this does not represent a regional significance.

4.9-4: No Action Alternative Air Emissions Estimates (tons/year)

Year	*CO*	*VOCs*	*NO_x*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2009	134	41	195	22	155	27
2010	98	33	128	14	109	18
2011	47	52	107	12	84	14
2012	42	15	103	11	47	10
2013	37	13	103	11	35	6

Under the No Action Alternative, operational and maintenance emissions would again reflect those presented in the BRAC/Transformation EIS (USACE 2007a). Table 4.9-5 presents these No Action Alternative emissions, compares them to the regional emissions, and estimates the percent contribution to the regional levels.

Table 4.9-5: No Action Alternative Operations/Maintenance Criteria Pollutant Emissions (tons/year)

	CO	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
No Action Alternative[1]	145.4	32.44	25.6	0.51	63.1	19.1
MSA Emissions	104,634	16,139	14,926	3,500	13,201	4,001
Regional Percent Contribution	0.14	.20	0.17	0.02	0.48	<0.48

Note: [1] Represents Fort Benning Baseline stationary emissions plus BRAC/Transformation operation emissions (Table 4.8-5 in BRAC/Transformation EIS, USACE 2007a).

Therefore, for this EIS no impacts are expected from additional personnel moving to Fort Benning above those identified in the BRAC/Transformation EIS.

Implementation of this alternative reflects the level of impacts determined for the BRAC/Transformation preferred alternative. In the final BRAC/Transformation EIS, it was concluded that emissions would not exceed federal and/or state standards and in fact represent less than 2 percent of regional emissions for

any criteria pollutant. This being the case, there would be no discernable impacts to air quality under the No Action Alternative.

4.9.2.2 Alternative A (preferred alternative) and Alternative B

The implementation of either of these alternatives would involve disturbance of thousands of acres and construction of millions of square feet of new buildings. Alternative A would impact fewer acres but would not differ significantly from Alternative B in terms of overall emissions; therefore, the scenario that could produce the most emissions (those found under Alternative B) is used in this analysis. Additionally, as construction is completed, training operations and day-to-day maintenance activities would begin to phase in with resultant operational and maintenance emissions associated with boilers and emergency generators, as examples. There would be no differences in maintenance or operations between the two alternatives so emissions would be the same if either alternative were selected for implementation.

In order to assess the air quality impacts of the Proposed Action (under either action alternative), emissions for both the construction and operational/maintenance segments of the action were evaluated on an annual basis. This evaluation involved review of data supplied by the Installation, including *Military Construction Project Data* Form 1391s (U.S. Army vd.), for information on the proposed construction activities and new sources that would be required as part of the Proposed Action. Appendix E contains the detailed emission calculations prepared to assess the construction air quality impacts of the Proposed Action alternatives.

Construction. From 2009 to 2013, numerous administrative and residential buildings, training complexes, and ranges would be developed. Additionally, roads (paved and unpaved) and tank trails would be either repaired or constructed to provide access to ranges and complexes. VOC, CO, NO_x, and SO_2 mobile source emissions are primarily generated by diesel-fueled heavy equipment operated in the construction areas. Particulate matter emissions, in the form of PM_{10} and $PM_{2.5}$ are primarily due to fugitive dust created by land disturbance activities, which include land clearing; soil excavation, cutting, and filling; trenching; and grading. Other sources of PM_{10} and $PM_{2.5}$ include diesel emissions from heavy construction equipment and tailpipe emissions from construction worker privately owned vehicles operated within the Installation fence line. Fugitive dust is particulate emissions released from sources that do not have a pinpoint exit such as a stack or vent.

Table 4.9-6 presents the estimated annual emissions from construction activities for the year in which the most pollutants would be emitted—2010. These emissions are then compared to the MSA regional emissions, and the regional contribution calculated. Because Alternative B would involve more construction, emissions would be slightly reduced for Alternative A.

Table 4.9-6: Projected Criteria Pollutant Construction Emissions (tons/year)

Year	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
2010	177	50	309	34	492	65
MSA Emissions	104,634	16,139	14,926	3,500	13,201	4,001
Regional Percent Contribution	0.2	0.3	2.1	1.0	3.7	1.6

Depending on the particular onsite controls used and local meteorological conditions, the Georgia Administrative Rule (GAR) 391-3-1.02(2)(n) 20 percent opacity rule for fugitive dust could be exceeded. To evaluate potential effects, the fugitive dust emission factor for PM_{10} (which is used as part of the $PM_{2.5}$ calculation) was assumed to include the effects of typical control measures such as routine site watering for dust control. A dust control effectiveness of 50 percent was also assumed, based on the estimated control effectiveness of watering. Additional controls, such as those presented in Table 4.9-7, may be needed to ensure compliance with regulations.

Table 4.9-7: Control Options for General Construction Open Sources of PM_{10}

Emission Source	Recommended Control Methods(s)
Debris handling	Wet suppression Wind speed reduction
Truck transport[b]	Wet suppression[c] Paving Chemical stabilization[d]
Bulldozers	Wet suppression
Pan scrapers	Wet suppression of travel routes[b]
Cut/fill material handling	Wind speed reduction Wet suppression
Cut/fill haulage	Wet suppression Paving Chemical stabilization[d]
General construction[e]	Wind speed reduction Wet suppression Early paving of permanent roads

Source: WRAP 2004.

Notes:

[a] Wet suppression and paving are control methods recommended by GEPD under GARR 391-3-1.02(2)(n).

[b] Dust control plans (prepared by the construction contractor) should contain precautions against watering programs that confound trackout problems.

[c] Loads could be covered to avoid loss of material in transport, especially if material is transported offsite.

[d] Chemical stabilization is usually cost-effective for relatively long-term or semi-permanent unpaved roads.

[e] Excavated materials may already be moist and not require additional wetting.

*Operations/Maintenance***.** As construction is completed, stationary air emissions from additional boilers and emergency generators, for example, would be generated. The Installation would have to evaluate these new emission sources for operating permits and for possible inclusion in the Title V permit amendments or modifications. Additional reporting, such as Tier I/Tier II or Form R requirements under the Emergency Planning and Community Right-to-Know Act (EPCRA) may be required. New construction projects evaluated in this EIS that will include operational emission units include:

- Trainee Barracks Complex (less than 10MMBtu boiler(s)); and
- Warrior in Transition Complex (less than 10MMBtu boiler(s)).

Over the last several years, Fort Benning has decentralized the Installation heating system, and the net result has been a reduction in emissions as aging units are replaced with more efficient ones. Numerous individual heating systems would be required for new facilities planned for construction under Alternative A. The vast majority of these systems would be small onsite electric or natural gas heating units that are well capable of heating under the mild winter conditions Fort Benning is subject to, and that

fall under the insignificant status under GA regulations. Larger facilities, such as barracks and other sizeable complexes comprising 150,000 square feet or more would require the Installation of one or more boilers of less than 10 MM Btu/hour capacity. Additionally, new boilers that may be required would not be tied to the hot water supply system. By separating the two systems (heat and water), and limiting the allowed input capacity of the boilers, Fort Benning can ensure that boiler use is limited to the heating season, which runs from November 1 to April 30, and may either: a) remain exempt from permitting requirements or, b) accept operational limits if they are included in the Title V permit.

Tanks to store fuel for stationary engines (such as emergency generators) also would be required. These tanks are often fairly small, and account for a minor portion of the total fuel storage capacity on the Installation. While the total number and capacity of these tanks is not known at this time, available data indicate that a small number of new emergency generators would be required as part of the Proposed Action. All emergency generators would need evaluating to determine whether these sources would need to be included in the Installation's Title V permit. Emissions due to operations and maintenance would not exceed federal and/or state standards but would have a minor impact on regional air quality due to the very small increases in annual criteria pollutant emissions. While Fort Benning will comply with all applicable federal and state air quality regulations, mobile source emissions from construction would increase from 2009 through 2013. Depending on the USEPA recommendation, Georgia may be required to develop an ozone SIP (this would not be anticipated until at least 2010). If this were the decision, Fort Benning may need to undergo an air quality general conformity analysis process once the ozone SIP is approved by USEPA.

In summary, there would be no significant impacts to regional air quality because:

- There would be no ambient air pollution concentrations emitted above the NAAQS.
- Emissions would not contribute to an existing exceedance of the NAAQS—there are no NAAQS exceedances areas in the ROI that could be contributed to.
- There are no PSD Class I areas within the ROI that could be impacted.
- No *stationary* source would be considered a major source of emissions per 40 CFR 52.21.

4.9.3 Mitigation Measures

While no mitigation measures (outside existing regulations, permits, and plans) are required, either action alternative would result in a small amount of new emissions sources which may require modification of Fort Benning's Title V permit; however, it is not anticipated that these emissions would exceed any of the established permit limits. Construction emissions would result in substantial fugitive dust, and that is expected to cause the largest criteria pollutant increase to be particulate matter emissions. These particulate matter emissions can be managed in accordance with Fort Benning's Title V permit regulations, the Georgia Air Rule Requirements, dust control requirements that are part of any construction project's Erosion and Sediment Control Plan, as well as additional measures that were presented in Table 4.9-7.

4.10 HAZARDOUS AND TOXIC MATERIALS AND WASTE

A hazardous substance is any material or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either on its own or through interaction with other factors. The terms "hazardous material," "toxic substance," and "hazardous waste" are used in this section, first to emphasize that they are all hazardous substances that may present a substantial threat to public health, welfare, and the environment, and second, to define the terms in reference to their unique applications under specific federal regulations.

Hazardous substances are defined and regulated in the United States primarily by laws and regulations administered by the U.S. Occupational Safety and Health Administration (OSHA), the USEPA, and the U.S. Department of Transportation (DOT). Each agency incorporates hazardous substance terminology in accordance with its unique Congressional mandate; therefore, the OSHA regulations categorize substances in terms of their impacts on employee and workplace health and safety, the DOT regulations in terms of the safety in transportation, and the USEPA regulations in terms of protection of the environment and the public health.

In terms of their environmental impacts, hazardous materials, toxic substances, and hazardous wastes are regulated under federal programs administered by USEPA, including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Emergency Planning and Community Right-To-Know Act (EPCRA), Toxic Substances Control Act (TSCA), and Resource Conservation and Recovery Act (RCRA). DoD installations are required to comply with these laws and all other applicable federal, state and DoD regulations, as well as CFR 112, EOs 13101 and 13148.

The OSHA Hazard Communication regulation (29 CFR 1910.1200) defines a hazardous chemical as any chemical which is a physical or health hazard. The definition includes chemicals which are carcinogens, toxins, toxic agents, irritants, corrosives, and sensitizers; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, unstable (reactive), or water-reactive; oxidizers; pyrophorics; and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gasses, fumes, vapors, mists, or smoke that may have any of the previously mentioned characteristics. Currently OSHA regulates workplace exposure to approximately 400 substances, including dusts, mixtures, and common materials such as paints, fuels, and solvents (OSHA 2006).

In CERCLA Section 101(14), the USEPA defines the term "hazardous substance" by reference to provisions in other environmental statutes that identify substances as hazardous (e.g., the OSHA definition as described above). The USEPA definition includes any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment and any substance for which a reportable quantity is established in 40 CFR 302.4.

The DOT Hazardous Materials Regulations (49 CFR 171) define a hazardous material as a substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The DOT definition includes hazardous substances, hazardous wastes, and marine pollutants.

The promulgation of TSCA represented an effort by the federal government to address those chemical substances and mixtures for which it was recognized that the manufacture, processing, distribution, use, or disposal may present an unreasonable risk of injury to health or the environment, and to effectively regulate these substances and mixtures in interstate commerce. Toxic chemical substances regulated by USEPA under TSCA include asbestos, lead, polychlorinated biphenyls (PCBs), and radon, and the TSCA Chemical Substances Inventory lists information on more than 62,000 chemicals and substances.

In regulations promulgated under RCRA, the USEPA defines hazardous waste as a solid waste which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) and exhibits any of the characteristics (ignitability, corrosivity, reactivity, toxicity) described in 40 CFR 261; or is listed in 40 CFR 261 Subpart D; or is a mixture containing one or more listed hazardous wastes. Hazardous wastes may take the form of solid, liquid, contained gaseous, or semi-solid wastes (e.g., sludges), or any combination of wastes, that pose a substantial present or potential hazard to human health or the environment and have been discarded or abandoned. In the generation of hazardous waste, the Installation tracks the generation of such materials through a manifesting documentation process so that the initial generation of the hazardous waste is tracked through its final disposal otherwise known as the "cradle to grave" cycle of hazardous waste management. Military munitions used for their intended purposes on ranges, or collected for further evaluation, such as recycling, are not considered waste per the Military Munitions Rule (40 CFR 266.202) as incorporated by reference by the State of Georgia Environmental Rule 391-3-11-.10(3).

4.10.1 Affected Environment

The ROI for hazardous materials, toxic substances, and hazardous wastes consists of the entire Installation. Through the combined efforts of the Safety Office, the Environmental Division, and the Directorate of Logistics (DOL), programs have been established at Fort Benning to control the entry of hazardous substances to the Installation; to safely manage their handling and transportation within the Installation, to inform military and civilian employees of their dangers; to minimize the risk of human exposure and release to the environment associated with these substances; and to dispose of these substances in an environmentally sound manner when they are no longer useful.

4.10.1.1 Hazardous Materials Storage, Use, and Handling

Routine operations on Fort Benning require the use of a variety of hazardous materials, including POL products, solvents, cleaning agents, paints, adhesives, and other products necessary to perform vehicle and equipment maintenance, military training activities, Installation upkeep, and administrative and housing functions.

The Garrison activities and tenants at Fort Benning procure hazardous materials through several supply channels. The primary supply channel is the Hazardous Materials Management Program, which is centrally managed by the DOL. The DOL maintains a contract with ITT Infrastructure Inc. to operate a Centralized Hazardous Materials Control Center (CHMCC) for the procurement and distribution of products needed to maintain the Installation's facilities and to sustain the military mission.

The CHMCC contractor staff, who are trained in hazardous materials management, utilize the Army supply system to conduct materials requisition and issue transactions. These transactions are entered into an Army-approved database program that relies upon a process of review and authorization to limit the types and quantities of hazardous materials that may be brought to the Installation. Through the use of the database, the CHMCC staff assists in ensuring user accountability for issued materials by providing a means of tracking each material through its life cycle. When the user has emptied the container or no longer needs the product, he/she can bring the container back to the CHMCC so that a final disposition entry can be made in the database or so that the remaining quantity of product can be reissued to another user to reduce unnecessary waste disposal.

Bulk quantities of fuels (e.g., heating oil, JP-8, gasoline, diesel) and other POLs (products and wastes) are managed in aboveground and underground storage tanks (ASTs and USTs), pumps, pipelines, and oil/water separators across the Installation, and these storage locations and facilities represent potential sources of small spills (Fort Benning 2004c). Emergency generators are typically supplied with fuel (JP-8, diesel, or motor gasoline [MOGAS]) stored in tanks; however, a few emergency generators on the Installation are fueled by natural gas and do not have an associated oil tank. In addition, some other hazardous materials (e.g., motor oil, antifreeze) are stored in tanks at various locations across the Installation. The ASTs and USTs at Fort Benning are managed in accordance with the Storage Tank Management Plan included in the Integrated Contingency Plan (ICP) which delineates the Spill Prevention, Control, and Countermeasure (SPCC) Plan, Installation Spill Contingency Plan, National Pollutant Discharge Elimination System, and Storm Water Pollution Prevention Plan (SWP3) requirements, and all other applicable federal and state laws and regulations.

4.10.1.2 Toxic Substances Management

Toxic substances commonly occurring on Army Installations include asbestos, lead-based paint, PCBs, and radon.

Asbestos. Routinely, all Fort Benning facilities scheduled for maintenance, renovation, remodeling, and demolition are inspected for presence of Asbestos-containing Materials (ACM). When required by law or as a precautionary measure, ACM is removed through outside contracts by licensed, specialized firms. Removed ACM is transported off Post by appropriately licensed transporters and disposed in appropriately permitted landfill facilities in accordance with applicable federal, state, local, and DoD regulations.

Lead-based Paint (LBP). The likelihood for buildings constructed prior to 1978 to contain lead-based paint/coatings is high. Painted surfaces can be tested to determine if LBP is present. If testing has not

been performed on surfaces painted before 1978, these surfaces should be presumed to contain LBP. There are several structures and buildings known or suspected to contain LBP on the Installation, and the LBP in these areas is generally managed in-place in accordance with industry guidelines and practices (e.g., National Institute for Building Sciences) in order to minimize the potential for creation of respirable dust, direct contact with the LBP surfaces, and contamination of the surrounding environment. Fort Benning's Lead-based Paint Management Plan addresses LBP risk assessment and disposal procedures for lead-based paint, coatings, and LDB-contaminated soils. All construction contractors will be required to follow plan procedures.

PCBs. PCBs are highly stable organic chemical compounds with a low flammability (i.e., they do not readily burn), high heat capacity, and low electrical conductivity. In the past they were extensively used as a component of many materials, most notably as heat insulating materials (e.g., hydraulic fluid in vehicles, lifts, elevators) and as dielectric fluids in electrical transformers and capacitors. The harmful effects of PCBs to humans and the environment were not well documented in the past; however, PCBs are now known to cause skin irritation, are a suspected carcinogen, and known to persist in the environment (i.e., they do not easily break down and they tend to accumulate in the tissues of living organisms). Under the authority of the TSCA, the USEPA banned the continued manufacture of PCBs after 1978. In addition, the agency imposed controls related to existing PCB-containing electrical equipment that remain in use or that are removed from service for reuse or disposal.

In 1998, Fort Benning developed a PCB Inventory Report, which indicated that of the 2,157 transformers surveyed on the Installation, 1,166 were assumed to be "PCB Transformers" (i.e., they contained equal to or greater than 500 parts-per-million PCBs) (Fort Benning 1998). Also in 1998, Fort Benning developed a PCB Management Plan (Fort Benning 1998) to formally establish the program for compliance with TSCA and other relevant regulatory requirements. Topics covered in the plan include transportation, storage, sampling, and disposal of PCBs. Since the utilities privatization initiative was implemented in 1999, the operation, maintenance, and repair of the electrical distribution system and, therefore, most of the PCB-containing electrical equipment on Fort Benning has been under the control of Flint Electric. One exception is the electrical system at Lawson AAF, which is under the management of Interior Electric. PCB-containing materials are not purchased by Fort Benning for use in any systems or materials used in construction, maintenance, and renovation projects on the Installation (personal communication, Clarke 2006).

Transformers at Fort Benning are located either on pads or on poles and are equipped with compartments for oil having a capacity of 20 to 40 gallons, depending on the size of the transformer. The oil used in these transformers is classified as either PCB/PCB-contaminated, or non-PCB. The non-federal owners of the electric system on the Installation are responsible for any PCB spills and other spills resulting from the operation of those electric systems (Fort Benning 2004c).

Radon. Radon is a naturally occurring, colorless, odorless, radioactive gas produced by the decay of uranium in rock and soil. Radon is a known carcinogen, capable of causing direct damage to lung tissues and increasing the risk of lung cancer when inhaled. If present, radon gas will typically concentrate in

airtight buildings and particularly in basements. Although there are no federal regulations that define an acceptable level of radon exposure, the USEPA recommends the voluntary, consensus-based mitigation of radon based on the standard developed and issued by the American Society for Testing and Materials (ASTM) International, *Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings,* ASTM E-2121**.** The Army and the USEPA recommend an action level of 4 picocuries per liter (pCi/L).

In FY 1988, the Army initiated a comprehensive indoor radon measurement and mitigation program. In the early 1990s, Fort Benning conducted a radon gas survey of 650 priority buildings (personal communication, Clarke 2006). This survey resulted in radon measurements that were well below the USEPA action level of 4 pCi/L. Only one site was recommended for re-survey, however, because of logistical impracticality, this site was not resurveyed. The Army Policy for Radon as outlined in AR 200-1, Radon Policy Reduction Program requires measurement of radon in newly constructed Army facilities and use of USACE design criteria for radon reduction in new construction. Radon information provided by Region IV of the USEPA and statistics maintained by the GEPD suggest that radon is not an issue of concern in the region. Proposed Actions would not affect radon levels nor would the activities increase radon exposure levels; therefore this topic will not be further analyzed in this document.

4.10.1.3 Hazardous Waste Generation and Disposal

Routine operations across the Installation generate a variety of hazardous wastes, including various solvents; paints; antifreeze; aerosols; contaminated filters, rags and absorbents; weapon cleaning patches and sludges; and some items managed as universal wastes, such as used batteries and fluorescent light tubes. The Centralized Accumulation Points (CAPs) and Satellite Accumulation Points (SAPs) are located throughout the Installation and contain a variety of wastes, which are typically stored in 5-gallon containers, 55-gallon drums, and other similar-sized containers.

The Fort Benning Environmental Division oversees the management of hazardous waste on behalf of the military units and activities that generate the waste. SAPs and CAPs are maintained in various locations across the Installation to facilitate the collection of hazardous wastes and to ensure that the wastes are transported off Post in accordance with applicable federal, state, and DoD regulations.

Hazardous wastes generated by Garrison and tenant activities are collected and transferred to a central storage area where they may be stored for no longer than 90 days before being transported offsite for treatment or disposal since Fort Benning is classified as a RCRA Large Quantity Generator of Hazardous Waste. Fort Benning arranges for the transport and disposal of its hazardous waste by appropriately-licensed waste management and transportation companies through a Defense Reutilization and Marketing Office (DRMO) contract.

Fort Benning trains approximately 1,500 workers, inspects nearly 287 waste accumulation areas annually, and provides program oversight for the disposal of over 192,475 pounds of hazardous and toxic waste generated per year (Fort Benning 2006h). Fort Benning currently operates under Corrective Action

Permit Number HW-021(CA) and Facility I.D. No. GA3210020084. Also, Fort Benning manages compliance with the relevant regulations through its Hazardous Waste Management Plan.

4.10.1.4 Contaminated Sites

Past resource and waste management practices at DoD facilities have resulted in the presence of toxic and hazardous waste contamination at some Installations, including Fort Benning. In response, Fort Benning has undertaken mitigation and cleanup activities under its Installation Restoration Program (IRP) to manage these sites, which are referred to as Solid Waste Management Units (SWMUs) (Fort Benning 2005c and d). The Fort Benning Environmental Division actively manages programs for addressing contaminated sites in compliance with RCRA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

These sites are designated either as Operation and Maintenance, Army (OMA)-SWMUs, which are being managed—and will be managed in the future as they are discovered—under the 2005 Fort Benning Environmental Action Plan (EAP), or as Environmental Restoration, Army (ER,A)-SWMUs, which are being managed under 2005 Fort Benning Installation Action Plan (IAP). The cleanup activities initiated under the EAP are directed at contamination primarily resulting from current operations, and the contaminants of concern include POLs, trichloroethylene (TCE), metals, VOCs, pesticides, and leachate. The IAP is specifically focused on contamination resulting from past activities, and the contaminants of concern include gasoline (including its constituents, benzene, toluene, ethylbenzene, and xylenes), paint, TCE, and leachate. Both the EAP and the IAP have been developed through consultation and coordination with the USAEC, USEPA, GEPD, and the public. There are currently 27 OMA-SWMU sites categorized as Active Site Investigations under the EAP and 30 ER,A-SWMU sites categorized as Active under the IAP.

Consistent with DoD policy, it is Fort Benning's policy to include a review process to identify any involvement of known or potentially contaminated sites that may be affected by proposed construction to prevent the spread of any contamination and to ensure that construction workers and personnel who utilize the project areas are not exposed to unsafe conditions. SMUs that need corrective action are identified on a GIS layer maintained for Fort Benning and this resource file is reviewed for any proposed construction projects. Those sites requiring corrective action have recorded land use controls that allow the project planners and engineers to evaluate the nature of the contamination and take proper action to prevent the spread of contaminants to the environment or expose personnel as a result of proposed construction. The nature of exposure protection includes the potential for subsurface vapor intrusion below buildings. When existing buildings that are proposed to be upgraded or changed and contamination is found, an investigation is performed to delineate the nature and extent of the contamination prior to construction including restriction of land use if necessary. For those locations where contamination has occurred in the past but a determination of No Further Action has been made, this determination is based upon the documentation that all contaminant exposure avenues have been identified and that all exposure levels of any contaminants are below all EPA and GEPD screening levels and no protective measures or additional clean-up or land use controls are necessary.

4.10.2 Environmental Consequences

The nature and magnitude of potential impacts associated with hazardous and toxic materials and wastes depends on the toxicity, storage, use, transportation, and disposal of these substances. The threshold for significant impacts to hazardous materials, toxic substances, and hazardous waste is surpassed if the storage, use, handling, or disposal of these substances substantially increases the risk to human health due to direct exposure, substantially increases the risk of environmental contamination, or violates applicable federal, state, DoD, and local regulations.

4.10.2.1 No Action Alternative

The No Action Alternative would have no effect on the baseline conditions for management of hazardous materials, toxic substances, hazardous waste, or contaminated sites at Fort Benning.

4.10.2.2 Alternative A (preferred alternative) and Alternative B

The implementation of Alternative A and B would have the same impacts with respect to hazardous materials and toxic substances and wastes and so are discussed together under this resource. Neither would introduce significant impacts to hazardous materials, toxic substances, and hazardous waste because there would be no increased risk to human health due to direct exposure associated with storage, use, handling, or disposal; would not substantially increase the risk of environmental contamination; or violate federal, state, DoD, or local regulations.

Hazardous Materials Storage, Use, and Handling. The number of sites storing, using, and handling hazardous materials would increase slightly under Alternative A. Any facilities (such as motor pools, maintenance areas, fuel loading areas, ammunitions storage) constructed to store hazardous materials would need to be designed to meet spill prevention requirements under AR 200-1, as well as applicable federal and state regulations.

The quantity of POL products, including fuels (diesel fuel, gasoline, heating oil), delivered to and used on the Installation would increase slightly as a result of the proposed activities. In the short term, quantities of various fuels in excess of current operating demand would be required for construction activities due to the use of mobile-power generators and heavy equipment. Over the long term, quantities of various petroleum fuels in excess of current operating demand would be required to meet future operating demand due to a small increase in the number of buildings using fuels for heating, hot water production, and backup power supply. Most of the proposed facilities would be connected to the natural gas supply and not rely on POL products. Furthermore, the energy saving mandates required by LEED would reduce the need for POL heating fuels for those facilities without access to the natural gas lines.

The risk of uncontrolled release of hazardous substances would be minimized through the use of industry accepted methods and by following applicable federal, state laws and regulations and Army policy for storage of fuels (e.g., double-walled aboveground storage tanks equipped with leak detection systems) and other hazardous materials (e.g., self-contained storage cabinets with appropriate flammability ratings).

Potential spills from the secondary containment structures associated with ASTs or spills in uncontained areas would be contained through the use of absorbent materials, portable booms, or other barriers. Absorbent materials such as dry sweep, sawdust, clay, vermiculite, diatomaceous earth, and manufactured oil absorbents would be used to control small isolated spills (Fort Benning 2004c). Absorbent materials and spill kits are currently maintained in sufficient quantities at existing oil handling and storage facilities and would be provided at any new oil handling and storage facilities constructed under Alternative A.

Units performing training exercises on Fort Benning that involve vehicles or refueling would continue to be required to take special care to prevent spills and to mitigate them should they occur. In addition, visiting training units would continue to be required to provide the Directorate of Facilities Engineering and Logistics funds in advance of their exercises to cover the cost of cleanup of any spills should they occur. These funds, the amount of which depends upon the type of the training exercise, are returned to the units if they are not used (Fort Benning 2006i).

Toxic Substances Management. There are several structures on the Installation that are known or suspected to contain ACM and/or LBP and for which renovation or demolition projects are proposed under Alternative A. All hazardous materials identified in the conversion of interior space (asbestos, lead-based paint, etc.) will be abated, and disposed of in accordance with current laws and regulations. The following table lists a sample of the proposed projects for which involvement of these toxic substances can reasonably be expected.

Table 4.10-1: Proposed Projects Potentially Generating Toxic Substances

Fiscal Year	Project Title
2009	Unit Maintenance Facilities
2010	Dining Facility to Support AST Training
	Maneuver Battle Lab
	Classrooms with Battalion Dining Facilities
	Classrooms & Dual Battalion Dining Facilities
2011	Dental Clinic Addition (Bernheim Site)

Asbestos. It is expected that the quantity of ACM present on the Installation would be reduced (i.e., a positive impact) under Alternative A, because ACM removal actions would be initiated prior to or during the renovation and demolition of existing structures. ACM encountered during Alternative A activities would be managed in accordance with applicable federal, state, and local regulations as well as the Fort Benning Asbestos Management Plan (Fort Benning 2002). The handling and disposal of existing ACM would not substantially increase the risk of environmental contamination, and would be carried out in accordance with applicable federal, state, DoD, and local regulations.

Lead-based Paint. The quantity of LBP present on the Installation would not be expected to change significantly because the preferred strategy for addressing LBP in existing buildings is to maintain it in good condition or cover it with non-lead-containing paint, and this strategy would be employed for buildings undergoing renovation. Where LBP is known to exist in buildings undergoing demolition, appropriate precautions would be taken to identify and segregate materials that must be classified as

hazardous waste due to their lead content and to arrange for their proper disposal in accordance with state and Federal regulations. The handling and disposal of existing LBP and LBP-contaminated materials would not substantially increase the risk to human health due to direct exposure, would not substantially increase the risk of environmental contamination, and would be carried out in accordance with applicable federal, state, DoD, and local regulations.

PCBs. The number of PCB-containing and PCB-contaminated items present on the Installation would not be expected to change significantly under Alternative A. There may be PCB-containing electrical system components and other PCB-containing equipment located on or near the sites where construction, renovation, or demolition activities are proposed under Alternative A. Efforts would be made to identify PCB-containing equipment (light ballasts, transformers, capacitors, hydraulic lifts, elevators, etc.) prior to and during the proposed activities. If identified, the removal and disposal or decontamination of such PCB-containing items would be carried out in accordance with applicable federal, state, local, and DoD regulations. Alternative A construction would not utilize PCB-containing materials.

Hazardous Waste Management. The Installation would maintain its status as a USEPA Large Quantity Generator of hazardous waste under Alternative A. Furthermore, it is expected that the types and quantities of hazardous wastes generated under Alternative A would be accommodated by the existing Fort Benning hazardous waste management system. The existing DRMO contracts for hazardous waste disposal are not limited in terms of the volume of hazardous waste that may be shipped offsite, and these contracts are reviewed annually; therefore, the DRMO would maintain the ability to amend the contracts to take into account minor changes in reference to the types and quantities of wastes managed in the future.

Hazardous waste and other regulated waste generated by visiting units during the training exercises would continue to be required to be disposed of through the Fort Benning DRMO. Training units would continue to be required to certify in advance of training that they have funds available to pay for waste disposal, and the units are responsible for completing all funding and related turn-in documents. Training units would continue to be required and instructed to comply with all applicable Installation policies such as Spill Prevention Control and Countermeasure requirements, as well as all federal, state, and DoD regulations pertaining to the handling, containment of spills, packaging, labeling, storage, and transportation of wastes generated by their activities on Fort Benning (Fort Benning 2006i).

It is expected that during construction and demolition activities there would be periodic increases in the quantity of hazardous waste generated and shipped offsite for disposal. Specifically, demolition debris and contaminated soils which exhibit any of the characteristics of hazardous waste would be managed as hazardous waste in accordance with applicable federal, state, local, and DoD regulations.

Contaminated Sites. Due to the limitations on land development and redevelopment on the Installation, it is expected that some of the proposed activities would necessarily occur on sites where contamination is known or suspected to exist. These sites may include either OMA-SWMUs, or ER,A-SWMUs (defined in Section 4.10.1.4). Disturbance of any SWMU is prohibited unless the GEPD determines the action to

be acceptable and appropriate; therefore, Fort Benning Environmental Division would coordinate with the GEPD in advance of initiating activities on any of its SWMU sites. Prior to any construction or land disturbance, Fort Benning would supply maps to the construction contractor identifying the SWMUs and any known VOC soil and groundwater contamination in the area being disturbed.

When new construction occurs on sites where contamination has been identified, existing management regimes would be employed to ensure that the risk of human exposure to contaminated media is minimized as much as possible. Such measures would include direct involvement of and consultation with Environmental Division and Safety Office representatives, review of existing reports, laboratory data, and relevant management plans prior to initiation of onsite activities, and the employment of a combination of visual observation, screening / monitoring, and sampling techniques to identify and segregate contaminated media encountered during all stages of site preparation and construction. For example, when site preparation includes earth moving activities (e.g., grading, leveling) in areas where the shallow subsurface soils are known to be contaminated, the contractors would be informed of the nature of the contamination in advance so that appropriate precautions can be taken to protect the workers and to appropriately manage the contaminated soils if and when they are encountered. Tank traffic in maneuver areas can cause disturbances, however, there are no SWMU sites located in the proposed maneuver areas.

The storage, use, handling, and disposal of hazardous materials, toxic substances, and hazardous wastes under the preferred alternative or Alternative B would not substantially increase the risk to human health due to direct exposure, would not substantially increase the risk of environmental contamination, and would not violate applicable federal, state, local, or DoD regulations. If Alternative A or B were implemented, it is not anticipated that there would be any adverse impacts associated with hazardous and toxic materials and wastes due to increased quantities on the Installation. Existing management procedures, regulations, plans, and permits would be used to minimize risk.

4.10.3 Mitigation Measures

No mitigation measures are required beyond those prescribed under existing federal and state laws, regulations, and permit requirements to minimize, avoid, or reduce impacts.

4.11 WATER RESOURCES

4.11.1 Affected Environment

The following sections provide a summary of the general baseline condition and character of water resources found at Fort Benning as well as more specific descriptions of the existing conditions of water resources in the immediate vicinity of the area where Transformation actions would be implemented. Types of water resources investigated include surface water, groundwater, and floodplains. Each type is discussed briefly in this section. Adherence to regulatory requirements by implementation of the Proposed Action would amount to practicable means to avoid or minimize harm to water resources. These requirements are identified in the description of the affected environment because of the interrelationship of regulatory requirements with the existing condition.

In terms of the regulated components of water resource management, implementation of any of the proposed alternatives would require coverage under Georgia DNR National Pollution Discharge Elimination System (NPDES) General Permits 100001, 100002, or 100003 (100001 regulates stand-alone construction activity, 100002 regulates infrastructure construction sites, and 100003 regulates common development construction). NPDES permitting regulates water quality as required by the Clean Water Act (CWA). Fort Benning has a Memorandum of Understanding with the Natural Resource Conservation Service (NCRS) to preserve and recover Fort Benning mission lands and Red-cockaded Woodpecker habitat. An Erosion, Sedimentation, and Pollution Control Plan (ESPCP) would be required prior to any land disturbances. Implementation of the No Action Alternative, Alternative A, or Alternative B would require coverage under the Section 404 permits for jurisdictional wetland or stream impacts as administered by the USACE. The requirements of federal and state law and regulations pertain to activities off-Post in order to reduce storm water concerns there as well.

Field verification of "state waters" would be required during the design phase of all proposed Transformation projects. A GEPD Stream Buffer Variance (SBV) would be required in cases where new construction, including infrastructure improvements, requires the crossing or encroachment upon "state water" by the removal of trees and/or vegetation within a 25 ft buffer of "state water." Application for a SBV must include an approved ESPCP, yet the application process for this variance is an entirely separate process from either the Georgia DNR NPDES or CWA Section 404 permit processes. The SBV restrictions apply to project construction activities, as well as timber removal within the 25-ft buffer. The SBV approval from the state must be received prior to the initiation of construction or land disturbance activities at those locations.

Coastal Plain physiographic provinces. The ecological transition between the Piedmont and Coastal Plain occurs along a Fall Line that is located partly within the northern boundary of Fort Benning. This geologic feature results in a unique character of the rivers and creeks and the biotic communities they support (Fort Benning 2001). The basin is 8,770 square miles, of which 6,140 square miles (70 percent) lie in Georgia, 2,574 square miles (29 percent) lie in AL, and 56 square miles (1 percent) lie in Florida (CRBWPP 2006). At Fort Benning, the rolling terrain in the Chattahoochee River Basin is highest in the

4.11.1.1 Surface Water

Watersheds. Fort Benning is located primarily within the Chattahoochee River Basin (USGS 2006) Hydrologic Unit Code[1] (HUC[1]) 03130003. The basin contains parts of the Blue Ridge, Piedmont, and east, rising approximately 740 ft above sea level, and lowest in the southwest along the Chattahoochee River, about 190 ft above sea level (Fort Benning 2001).

Watershed management practices adhered to by Fort Benning include the development and implementation of a soil conservation program at the watershed level. Watershed Management Units (WMUs) were identified at Fort Benning for use as a framework for monitoring water quality and erosion, watershed restoration projects, and for other management activities as part of a watershed inventory in 1998 (Figure 4.11-1). Based on data from this watershed inventory, Fort Benning is composed of 29 WMUs. Fifteen WMUs occur completely or nearly completely within the boundaries of the Installation. One of the objectives stated in Fort Benning's INRMP (Fort Benning 2001) is to continue to conduct monitoring via the Land Condition Trend Analysis component of the ITAM Program and add new monitoring plots, as necessary, to enable monitoring within a watershed context to facilitate land use decisions and other land management activities (Fort Benning 2001). A watershed modeling plan for Fort Benning is under development.

Construction

Management of storm water during construction activities including stand alone infrastructure/lineal projects would be covered under Georgia DNR NPDES General Permits 100001, 100002, and 100003 and would also require the development and implementation of an ESPCP. Construction activities disturbing less than one acre will be regulated under MS4 NPDES Permit No. GAG480000. A Notice of Intent (NOI) for construction-related storm water discharge must be obtained from the Georgia DNR. It is expected that the implementation of the ESPCP would reduce or minimize any impacts to water resources and protect waterways from sedimentation due to eroding soil conditions. Field verification of "state waters" would be required during the design phase by a qualified professional. Stream buffers must be defined on design plans prior to the initiation of construction activities.

Perpendicular crossings to "state waters" would be approved with an ESPCP as required by Georgia DNR NPDES General Permits 100001, 100002, or 100003 if no stream channel changes are required. The design must address all proper BMPs to reduce the potential for stream sedimentation including: water crossings; identification of areas where drainage may be an issue in the project planning stage; use of double-row, silt fencing; and site monitoring to ensure the integrity of erosion control measures.

---

[1] **Hydrologic Unit Codes (HUC):** Watersheds are organized into a system that divides and subdivides the United States into successively smaller watersheds. These levels of subdivision, used for organization of hydrologic data, are called "hydrologic units". Hydrologic Unit Codes are given to each of these units in a manner that preserves watershed hierarchy. This is done by adding additional digits to a watershed's HUC to designate smaller sub-watersheds within an encompassing watershed. As an example, a large river watershed may have an 8-digit HUC of 02040301. All sub-watersheds to this watershed would begin with this 8 digit number, but would have additional digits as their unique identifier (02040301*102*, 02040301*103*, etc.) These unique identifiers are commonly used by federal and state agencies to organize and track water quality impairments.

Figure 4.11-1: Fort Benning Watershed Management Units

Erosion control measures must be in place prior to initiation of land disturbing activities. The design must address all proper BMPs as stated above for the crossing as well as the relocation of the new channel. All construction areas must be stabilized within 14 days of project completion. If the contractor or operator returns to the construction site within the initial 14 days to conduct some additional land disturbing activities, the timeframe in which stabilization is required may be extended by 7 days. For all "state waters" a 25-ft buffer must be maintained and protected at all times. It is expected that implementation of Georgia's stream buffer rules would reduce or minimize any impacts to water quality due to stream sedimentation or storm water runoff. Failure to comply with Georgia's stream buffer rules may have notable long-term and short-term environmental consequences on water quality due to notable increases in stream sediment and storm water runoff.

Implementation and operation of the proposed alternatives would require compliance with NPDES Municipal Separate Storm Water Sewer System (MS4) Permit conditions (Permit No. GAG480000) and associated Storm Water Management Plan (SWMP) including the monitoring of activities conducted within the Installation boundary. NPDES MS4 and the SWMP help to ensure that illicit discharges are prohibited and that pollutants entering into waterways from construction and maintenance facilities are prevented, reduced or minimized. Spill Prevention Control and Countermeasure (SPCC) requirements must be adhered to during construction activities as well as during operations of the newly constructed facilities. Failure to comply with the NPDES MS4 permit conditions and SPCC requirements may result in a greater probability of illicit discharges entering into waterways from construction sites. The NPDES construction permit and NPDES MS4 permit (Permit No. GAG480000) would be used to mitigate water resource impacts.

It is likely that a CWA Section 404 permit would be required for construction associated with the proposed alternatives for jurisdictional wetland and stream impacts and that control measures would be specified by the USACE as conditions of permit approval. It is expected that the implementation of control measures specified in the Section 404 permit would reduce or minimize any impacts in water resources and protect waterways from sedimentation due to eroding soil conditions. A violation of the Section 404 permit would occur if these control measures were not enforced.

Indirect water quality impacts to waterways, including stream sedimentation and increases in the volume of storm water runoff would occur as a result of land disturbing activities. Alternative A, if implemented, would disturb approximately 10,045 acres of land. Transformation Alternative B, if implemented, would disturb approximately 24,595 acres of land. The anticipated land-disturbance has the potential to affect the amount of sediment entering into waterways occurring within the Installation, and other downstream water resources. Fort Benning would mitigate significant effects to water resources associated with land disturbing activities by complying with the NPDES ESPCP as required by the CWA. As part of the NPDES permit, Fort Benning would update its existing SWP3 to include projects in the planning stages of construction and operation. As the site-specific ESPCP is being developed, BMPs designated to minimize pollution through source control including rock check dams, rock channels, sediment basins, diversions, and the placement of silt fence and erosion control practices must be considered.

Applicable management practices that may be used to help reduce and/or maintain the average annual sediment loads include:

- compliance with the requirements of the Georgia NPDES permit program;
- implementation of Georgia Forestry Commission BMPs for forestry;
- Natural Resources Conservation Service (NRCS) Conservation Practices;
- adoption of proper unpaved road maintenance practices;
- implementation of ESCP for land disturbing activities; and
- mitigation and prevention of stream bank erosion due to increased stream flow velocities caused by urban runoff (GEPD 2003a and Fort Benning 2004).

Management practices recommended by Georgia DNR, and followed by Fort Benning, to reduce and/or maintain the average annual fecal coliform is similar to those for sediment loads and include:

- compliance with NPDES permit limits and requirements;
- coordination with the NRCS for erosion control services and projects ; and
- application of Best Management Practices (BMPs) appropriate to agricultural or urban land uses, whichever applies (GEPD 2003b).

Fort Benning has a Memorandum of Understanding with the NRCS to control erosion. The NRCS provides contractor bidding services, performs surveys, and prepares and implements erosion control plans.

The Army will implement the principal of Low Impact Development (LID) in the final planning, design, and permitting of its stormwater runoff for the proposed actions. The goals of LID are to equate the post-development stormwater runoff hydrology with the pre-development hydrology. The intent of LID is to control non-point source runoff through the application of plant-soil-water mechanisms that protect and sustain the ecological integrity of the receiving water bodies and wetlands (USACE 2008). LID design focuses on small scale, close to the source stormwater management. LID technologies are well suited to reduce stormwater runoff loadings for a variety of potential contaminants including sediment, otherwise known as total suspended solids, nitrogen, phosphorous, and heavy metals. LID practices at the planning level are in conformance with EPA's nonstructural Pollution Prevention strategies (USACE 2008). Consistent with the NEPA process, detailed engineering designs for stormwater treatment are not available for inclusion into this EIS as the proposed action is still under planning review. However, consistent with successful LID demonstration projects at Fort Stewart, Fort Lee, and Fort Bragg, it is anticipated that several LID techniques will be used during the final planning, design, and permitting of the proposed action at Fort Benning. These measures will include a series of integrated management practices to match the "pre-/post-" hydrologic conditions in the construction areas.

Operation, Maintenance, Training Exercises

Surface water resources are subject to contamination from soil sedimentation, oil spills, pesticide residue, and combined sewage-stormwater overflows bypasses. These potential pollution sources are controlled and minimized, however, by implementation of SPCC, Installation Spill Contingency Plan (ISCP), SWP3 (General Permit No. 000000) for industrial facilities, ESPCP and SWMP, Georgia DNR NPDES MS4 (Permit No. GAG480000), by sewage bypass reduction efforts, and by the related NPDES permit requirements to prevent sewage bypasses under the Columbus Water Works (CWW) NPDES permit for their Waste Water Treatment Plant (WWTP) and pretreatment facilities. The SWP3 provides protection for the water sources within the Installation by requiring monitoring of storm water discharges and implementation of BMPs, including inspection of the facilities and maintenance vehicles, awareness of potential circumstances for spills, and selection of smart storage locations.

Rivers, Streams, Tributaries, and Other Water Bodies. The largest water body associated with Fort Benning is the Chattahoochee River which flows through approximately 15 miles of the Installation (Fort Benning 2001). The Chattahoochee River is the most heavily used water resource in Georgia (CRBWPP 2006). The state of Georgia has designated the Chattahoochee River as "impaired" as it does not fully meet the water quality standards established by the Georgia Department of Natural Resources. The Chattahoochee River arises as a cold-water mountain stream in the Blue Ridge Province at altitudes above 3,000 ft and flows 430 miles to its confluence with the Flint River (USGS 2006). This river begins in the Blue Ridge Mountains of Union County a distance of 434 miles across the state of Georgia, beginning in the Blue Ridge Mountains of Union County, GA, flowing past metropolitan Atlanta, reaching the Georgia and Alabama borders at West Point Lake. Ultimately, the southern flow of the Chattahoochee River terminates in Lake Seminole in Florida, an impoundment of the Apalachicola River (CRBWPP 2006).

Several dams have been built on the Chattahoochee River upstream and downstream of the Army to regulate river flow and produce hydroelectric energy. The northern portion of Lake Walter F. George, on the Chattahoochee River extends into the southwest portion of the Installation. The River Bend area, which is part of the Lake Walter F. George impoundment, constitutes the only lake on the Installation. Numerous oxbows, abandoned meandering channels, and isolated ponds are found along the Chattahoochee River.

In contrast to the main stem of the Chattahoochee River, many tributaries remain free flowing (CRBWPP 2006). Most streams found within Fort Benning flow into the Chattahoochee River through Upatoi Creek on the Georgia side and Uchee Creek on the Alabama side. The southernmost portion of Fort Benning drains directly into the Chattahoochee River, and the northwest portion of the Installation drains into Bull Creek (Fort Benning 2001). A very small area in the southeast corner of Fort Benning flows into the Flint River basin to the east. These two rivers join to the south and flow into the Gulf of Mexico (Fort Benning 2004).

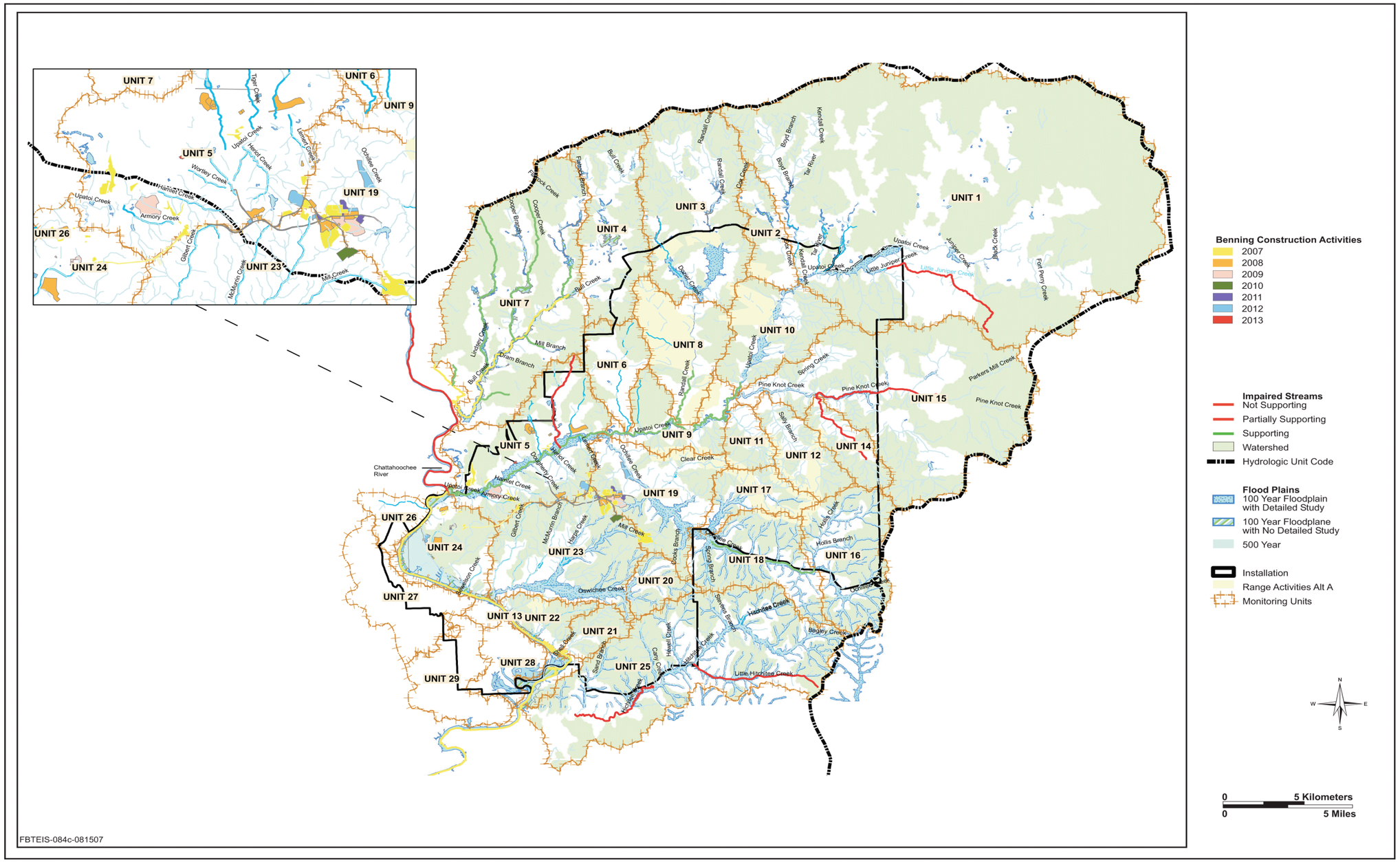


Figure 4.11-2: Potentially Affected Surface Waters Identified under Alternatives A and B

This page intentionally left blank.

GEPD has identified 31 stream segments in the Chattahoochee River Basin as "water quality limited" (i.e. State of Georgia 305(b)/303(d) listed) or impaired due to sedimentation. Of the 31 stream segments identified by GEPD and occur either on or in the immediate vicinity of Fort Benning, six have the potential to be affected by the proposed action with regard to sediment loading. One stream segment is both fecal coliform impaired and is Fish Consumption Guidelines restricted due to PCB contamination in that segment. The source(s) of the PCBs in this segment is unknown according to the GEPD (see Table 4.11-1 and Figure 4.11-2) (USEPA 2002 and GEPD 2006a).

Table 4.11-1: Impaired Streams at Fort Benning

Water Body Name USEPA HUC	***State Designated Use***	***Attainment Status***	***State Impairment***	***TMDL Pollutant Description/ Type***	***Annual Average Sediment Load* (tons/yr)***	***Approximate Location***
Pine Knot Creek GAR031300030305	Fishing	Partially Supporting	Biota Impacted	Sediment/ Point; Non-Point Source	6,945	Parker Mill Creek to Little Pine Knot Creek
Little Pine Knot Creek GAR031300030307	Fishing	Partially Supporting	Biota Impacted	Sediment/Non-Point Source	272	Headwaters to Pine Knot Creek
Little Hitchitee Creek GAR03130003062	Fishing	Partially Supporting	Biota	Non Point/Point	555	Headwaters to Hitchitee Creek
Little Juniper Creek GAR0313000302	Fishing	Partially supporting	Biota	Non-Point Source/ Sediment	1,486	Headwaters to Kings Mill Pond
Hitchitee Creek GAR031300030603	Fishing	Partially Supporting	Biota	Non Point/Point	5,172	Caney Creek to Sand Branch
Tiger Creek GAR031300030306	Fishing	Partially Supporting	Biota Impacted	Sediment/Non-Point Source	625	Headwaters to Upatoi Creek

**Sources:* USEPA 2002, GEPD 2003a, and GEPD 2006a.

Water bodies on the 303(d) list are required to have a Total Maximum Daily Load (TMDL) evaluation for the water quality constituent(s) in violation of the water quality standard. The TMDL process establishes the allowable pollutant loadings or other quantifiable parameters for a water body based on the relationship between pollutant sources and in-stream water quality conditions. This allows water quality-based controls to be developed to reduce pollution and to restore and maintain water quality. The state-designated water use classification for all 31 of the stream segments listed as water quality limited (i.e. 303(d) listed as Biota Impacted) due to sedimentation is fishing. The general water quality criteria not being met states that "All waters shall be free from material related to municipal, industrial, or other discharges which produce turbidity, color, odor or other objectionable conditions which interfere with legitimate water uses." The biota-impacted designation indicates that studies have shown a modification of the biological community, more specifically, fish (GEPD 2003a).

Data collected during the development of the TMDL suggests that impaired streams may be due to sediment resulting from past land use practices. Farmland use, specifically row crops, appears to have been a major source of sediment. The established TMDL determines the allowable sediment load and is based on the hypothesis that an impaired watershed having annual sediment loading rates similar to other streams that are not impaired would remain stable. It is believed that if sediment loads are maintained at an allowable level (i.e., no more than the 2002 annual average sediment load), streams would repair themselves over time. No set "allowable" level has been established for the stream segments on Fort Benning; instead, the Installation is utilizing management practices, as defined in the Georgia DNR guidance for TMDLs. The GEPD revised its NPDES permits for construction activities in August 2008. The 2008 changes required that the ESPCP include site specific conditions or requirements for any project construction requiring an NOI with discharges into or within one mile upstream of an impaired waterbody. If a TMDL Implementation Plan for sediment has been finalized at least six months prior to the permittee's submittal of the NOI, the site specific conditions and/or requirements apply. The new rule states that the project design specifications must include four of twenty possible BMP's outlined in the rule in order for the discharge not to cause or contribute to a violation of state water quality standards.

Applicable management practices that may be used to help reduce and/or maintain the average annual sediment loads are presented in the construction discussion earlier in this section.

The State of Georgia has identified 79 stream segments located in the Chattahoochee River Basin as water quality limited due to fecal coliform only. A stream is placed on the partial support list if more than 10 percent of the samples exceed the fecal coliform criteria and on the not support list if more than 25 percent of the samples exceed the standard. Part of the TMDL development process is to identify potential source categories. Sources are broadly classified as either point or non-point sources. A point source is defined as a discernable, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Non-point sources are diffuse, and generally, but not always, involve accumulation of fecal coliform bacteria on land surfaces that wash off as a result of storm events. CWW has two permitted point sources on Fort Benning (wastewater treatment plants) that discharge to the Chattahoochee River, and Fort Benning has a general storm water permit. The wastewater treatment plants are owned by CWW. They are

located within the Installation boundary and all discharges and regulations associated with discharges of waste waters are covered under a separate CWW industrial NPDES permit. Combined point and non-point source fecal coliform releases originating from sources located upstream from the Installation are also contributors for fecal coliform in the Fort Benning section of the Chattahoochee River. The waste load allocation is established by the GEPD and is used to determine the "maximum allowable" levels of fecal coliform that may be discharged into the stream or river. As long as Fort Benning follows the management practices by Georgia DNR, it is not required to reduce its discharge into the Chattahoochee River and is in compliance with the TDML program (GEPD 2003b and Fort Benning 2004b).

Management practices recommended by Georgia DNR, and followed by Fort Benning to reduce and/or maintain the average annual fecal coliform, are similar to those for sediment loads and include:

- compliance with NPDES permit limits and requirements;
- adoption of NRCS Conservation Practices; and
- application of BMPs appropriate to agricultural or urban land uses, whichever applies (GEPD 2003b).

The amount of sedimentation and fecal coliform pollutants delivered to a stream is difficult to determine. The state requires and monitors the implementation of management practices to improve stream water quality, and represent a beneficial measure of TMDL implementation (GEPD 2003a and GEPD 2003b). Although GEPD has identified some water quality impairment, there is also information indicating biologically productive and ecologically sustainable water resources exist within the Installation. Aquatic surveys conducted by the USFWS documented 53 historically represented fish species and five fish species previously unrecorded on the Installation. One of the new fish species, spotted bullhead (*Ameiurus serracanthus)*, is a state-listed species of conservation concern. Six native mussel species were identified along with one introduced species of mussel. Three of these mussel species are identified as species of special concern in AL (Fort Benning 2001).

4.11.1.2 Hydrogeology/Groundwater

Fort Benning is located within the Coastal Plain hydrogeologic province. The principal groundwater source for Fort Benning is the Cretaceous aquifer system. The recharge area for this aquifer is the Sand Hill cantonment area (Fort Benning 2004b). The regional direction of ground-water flow in the Coastal Plain is from the north to south. Aquifers in the Coastal Plain consist of porous sands and carbonates, and include alternating units of sand, clay, sandstone, dolomite, and limestone that dip gently and thicken to the southeast.

4.11.1.3 River and Stream Floodplains

Executive Order 11988, Floodplain Management, instructs federal agencies to consider the risks, danger, and potential impacts of locating projects within floodplains. The EO specifies that, in situations where alternatives are impractical, the agency must minimize potential harm to or within the floodplain and take appropriate steps to notify the public.

Floodplains typically are described as areas likely to be inundated by a particular flood. For example, a flood that has a one percent chance of occurring in any one year is the 100-year flood. The 100-year floodplain includes those lands that are flooded by small and often dry watercourses. To determine the location of the 100-year floodplain within the study areas, the 1985 Flood Insurance Rate Maps (FIRM) for Muscogee and Chattahoochee Counties and GIS maps developed for this area were reviewed.

The Chattahoochee River floodplain, and its associated blackwater and tupelo swamps, is found in the southwestern portion of the Installation. The floodplain areas provide abundant recreational opportunities to Installation personnel and the general public (Fort Benning 2001). Threats to the floodplain area and its wildlife include water pollution, water level manipulation, sedimentation, and disturbance of nesting migratory bird species. The Chattahoochee blackwaters are identified in Fort Benning's INRMP as a UEA. Military use of the Chattahoochee River floodplain is minimal (Fort Benning 2001).

Stream floodplains on Fort Benning are extensive. Military training within the stream floodplains is minimal and a large portion of these areas have been proposed for protection as UEAs. Threats to stream floodplain include damage by rooting feral swine, damage to stream ecology from low water crossings, future range construction, and water pollution (Fort Benning 2001).

Per U.S. Army Infantry Center (USAIC) Regulation 210-4, stream fording and crossing within the Installation with wheeled and tracked vehicles currently is approved for the following locations:

- Cactus Road at Pine Knot Creek;
- Buena Vista Road at Pine Knot Creek;
- Buena Vista Road at Upatoi Creek;
- Buena Vista Road at Randall Creek;
- Bulls Eye Road at Randall Creek;
- Hourglass Road at Ochillee Creek;
- Midwest Road at Randall Branch; and
- Resaca Road at Sally Branch (U.S. Army 2005b).

Articulating concrete mats are used to harden low-water crossing sites along tank trails at Fort Benning

4.11.1.4 Stormwater Management

Storm water discharge in the Main Post cantonment area of Fort Benning drains directly into the Chattahoochee River through a storm drainage system. Other storm water on the Installation drains via culverts, ditches, swales, and natural seepage and overland flow. Storm water from the other cantonment areas, Sand Hill, Kelley Hill, and Harmony Church, as well as the training compartments drain directly and indirectly into nearby surface water bodies (Fort Benning 2004b).

Installation requirements to comply with the provisions of the CWA and state regulations to manage storm water prevention are stipulated in AR-200-1, Environmental Protection and Enhancement, as well as Georgia DNR NPDES and ADEM NPDES rules and regulations. The requirements of federal and state laws and regulations pertaining to activities off-Post also reduce storm water concerns.

Surface water resources are subject to pollution from soil sedimentation, oil spills, pesticide residue, and untreated sewage bypasses. These potential contamination sources are controlled and minimized by implementation of the Fort Benning SPCC Plan (Fort Benning 2003b), Fort Benning's ISCP (Fort Benning 2000), Fort Benning's SWP3 (General Permit No. 000000) for industrial facilities, ESPCP and the SWMP, General MS4 (Permit No. GAG480000), sewage bypass reduction efforts, and by the related NPDES permit requirements to prevent sewage bypasses for their WWTP and pretreatment facilities. The SWP3, ESPCP, and the SWMP provide guidance for the protection of the water resources within Fort Benning by monitoring storm water discharge and implementing BMPs.

Management of storm water would be accomplished by meeting the requirements of three separate NPDES permits. Implementation of proposed projects having the potential to disturb one acre of land would require coverage under Georgia DNR NPDES General Permits 100001, 100002, or 100003. An ESPCP would be developed prior to construction activities as required by the NPDES permit. Operators and contractors must follow and implement all requirements identified in the NPDES permit. The ESPCP must be prepared, designed, and signed by a design professional with a GA NPDES Level II Training. Personnel qualified through GA NPDES Level 1A training are required to be on site during construction activities.

For projects that are not covered under the Georgia DNR NPDES General Permits 100001, 100002, or 100003, typically for land disturbance less than 1 acre, are covered under the NPDES MS4 permit requirements (Permit No. GAG480000). Fort Benning uses a basic ESPCP designed similar to the one required under General Permit 100001 Part IV. Projects that are not subject to Georgia DNR NPDES permit would not be covered under a State permit but would comply with the federal requirements for such projects with regard to the protection of water resources from sediment and other pollution.

Good housekeeping measures should be implemented to control soil erosion, reduce the amount of runoff, and to prevent or minimize pollution of storm water. Double row type C silt fencing would be installed prior to any land disturbing activities. Contractors and operators will ensure that permanent or temporary stabilization of previously disturbed soils in place within 14 days of project completion. If the contractor or operator returns to the construction site within the initial 14 days to conduct some additional land disturbing activities the timeframe in which stabilization is required may be extended by 7 days. Other BMPs to be implemented during land disturbance and/or construction activities include: dust control measurements, off site vehicle tracking control, proper waste disposal at the site, and site sanitation. BMPs for land disturbing and or construction activities, including road improvements must:

- be designed in accordance to the Manual for Erosion and Sediment Control in Georgia;
- protect all storm water drainages near the work area that would be affected from runoff during storm events;
- comply with SPCC requirements as outlined in AR 200-1 when handling hazardous materials/waste within a construction site.

The contractor and or proponent are responsible for the cleanup of any hazardous material/waste or chemical spills.

The function of the stream buffers is to physically protect and separate streams from land disturbing activities and/or encroachment. Stream buffers function primarily to filter storm water runoff, stabilize stream banks, facilitate nutrient uptake to tree roots, and provide shading to moderate water temperature and to provide flood capacity during flooding events. The design/siting of facilities within the Installation would influence the effects on water resources by determining the direct impacts to streams and/or their buffers. Georgia's Erosion and Sedimentation Act implements stream buffer regulations stating that any proposed land disturbing activity within a 25-ft buffer of a "state stream" would require a GEPD SBV. Specific requirements would need to be followed if there are any SBVs. Fort Benning would also follow the guidance of the Georgia Water Quality Control Act. The Georgia Water Quality Control Act declares that the water resources of the state shall be utilized prudently for the maximum benefit of the people. Field verification of "state waters" would be required during the design phase of all proposed Transformation projects. Application for a SBV must include an approved ESPCP. Restrictions on the encroachment of riparian stream buffer apply to project construction and operations activities, as well as for timber removal within the 25-ft buffer.

Adherence to Georgia DNR NPDES requirements ensures that all wastewater from dining/kitchen/ bathrooms/shower facilities and other operation requiring potable water are connected to the sanitary sewer system, not the storm water sewer system. Coordination with CWW is required for Sanitary Sewer and Sewage Disposal Ordinance requirements, particularly to meet Ordinance No. 83-101 Section 7, for management of fat, oils, grease, and to meet Fort Benning's MS4 NPDES Permit GAG480000 requirements. Good management practices and maintenance of grease/oil collection sumps are to be implemented at all times to prevent or minimize sanitary sewer overflow into the stormwater system.

Management of storm water at industrial facilities includes the implementation of General Permit 000000 requirements for industrial facilities and the development and utilization of the SWP3. Surface water resources are subject to contamination from oil spills, pesticide residue, and combined sewage-stormwater overflows. These potential contamination sources are controlled and minimized; however, by implementation of the SPCC, ISCP, and SWP3 (General Permit No. 000000), by sewage bypass reduction efforts, and by the related NPDES permit requirements to prevent sewage bypasses. Installation requirements to comply with the provisions of the CWA and state regulations for storm water prevention are stipulated in AR 200-1.

Fort Benning's SPCC Plan is applied to new or redesigned facilities such as vehicle maintenance facilities, and facilities used to store hazardous materials in containers larger than 55 gallons and/or the use of underground storage tanks and/or above ground storage tanks. All maintenance and chemical storage areas would require proper design to ensure that no illicit discharges from the facilities would come in contact with surface and/or ground waters. All new storage areas for hazardous materials, chemicals, or wastes should be designed to allow for secure product storage and to provide secondary containment as per AR-200-1 and CFR 112. This would also meet CWW Ordinance No. 83-101 as well as future Fort Benning NPDES, MS4, and SWMP requirements.

Management of storm water at the Installation level would be accomplished by implementing Fort Benning's NPDES MS4 permit (Permit No. GAG480000) for military Installations and by the SWMP. Construction site run off and post-construction storm water management are Minimal Control Measures (MCM) required under the Military MS4 permit. Installation units would be required to follow MCM under MS4 for all storage areas within industrial areas, living quarters, parking areas, and other day-to-day operations. Under the Phase II NPDES MS4 requirements, activities constructed within the Installation boundary would be monitored to help ensure illicit discharges are prohibited and that pollutants from small construction or maintenance activities are prevented, reduced, and/or minimized to meet Fort Benning standards as per the SWMP. Good housekeeping measures for municipal operation are also addressed by the SWMP. Fort Benning has been regulated under Georgia DNR NPDES MS4 Phase II since August 2003; the permit (Permit No. GAG480000) has been finalized by GEPD and will become effective on July 15, 2009. Basic requirements are being implemented at the Installation level as part of the basic AR 200-1 requirements.

Areas where drainage is anticipated to be a problem should be identified during the planning stages of a Transformation project. Projects proposed in areas identified as having the potential for drainage issues may require additional requirements during and after maintenance or construction activities to manage storm water runoff outside of the actual project boundary to include measurements to prevent and minimize water quality impacts after construction ends. These may include but are not limited to: evaluation and design of new and existing drainage systems to ensure proper capacity; Low Impact Development (LID) considerations; storm water runoff watershed protection; and existing and future state-generated TMDL Plans.

4.11.1.5 Sediment and Erosion Regulations

The Georgia Water Quality Act (1964) established a standard of not more than a 25 nephelometric turbidly units (NTUs) difference between water samples taken upstream of land disturbing activity and water samples downstream of the activity. Alabama's Department of Environmental Management rules and regulations prohibit more than a 50 NTUs difference between upstream and downstream measurements.

Fort Benning actively manages storm water quality and sedimentation from surface water runoff in conformity with the Georgia Erosion and Sediment Act of 1975, and Clean Water Act (Georgia State Clean Water Laws) (Fort Benning 2001). Fort Benning requires the use of BMPs for all soil disturbing activities that may occur during construction, demolition and maintenance projects, training activity, site restoration, and forest management activities (Fort Benning 2001). Fort Benning personnel ensure that all Record of Environmental Considerations (RECs) (FB-144R) provide military units and natural resource management personnel with soil conservation planning assistance before and during land disturbing projects. Georgia's Erosion and Sedimentation Act (OCGA 12-7-1) implements stream buffer regulations for non-trout waters. Any proposed land disturbing activity within a 25-ft buffer of a water resource would require a GEPD SBV. The state of Alabama has different regulations but since no activities

proposed will require ADEM permitting or approvals no discussion of Alabama's regulations is necessary.

4.11.1.6 Aquatic Habitats and Wetlands

Aquatic habitats include the waters and substrates of lakes, ponds, rivers, and streams. Certain portions of all the aquatic habitats at Fort Benning may qualify as jurisdictional wetlands and streams. Wetlands are transitional between aquatic and terrestrial environments and are defined under the CWA as areas that are "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328.3). Jurisdictional wetlands are specifically protected under Section 404 permitting process and are discussed in more detail in this section.

Within the area potentially affected by the proposed projects, wetland and aquatic habitats occur in the road construction and improvement areas, Harmony Church, Main Post, and Sand Hill cantonment areas, the ranges north of U.S. Highway 27/280, and within the ranges to the south of U.S. Highway 27/280.

Aquatic habitats and wetlands at Fort Benning include 7 of the 14 ecological groups described in the INRMP and draft revisions in 2002 and 2003. The seven habitat types, along with characteristic plant and animal species, are described below, based on INRMP descriptions. Table 4.11-2 lists the seven ecological groups and the estimated acreage of each that occurs at Fort Benning. In Figures 4.11-3 and 4.11-4, the occurrence of these aquatic ecological habitats at Fort Benning are presented.

Table 4.11-2: Aquatic Habitat Acreage

Freshwater Aquatic Habitat	Existing Acres at Fort Benning
Gum / oak ponds	217
Open water (Impounded and Flowing)	2,492
River floodplains and Cypress-Tupelo swamps	3,825
Seasonal depression ponds	163
Small stream swamps and wooded seepage bogs	9,858
Stream floodplains	13,394
Herbaceous and Shrub Seepage Bogs	404
Total	30,352

Open Water

Water impoundments at Fort Benning are the result of human activity and beaver dams. Flowing water habitats include rivers, creeks, and intermittent streams. These areas are mostly unvegetated or exhibit only submerged vegetation or plant life along the shoreline.

At Fort Benning, flowing water includes streams of either Piedmont or Coastal Plain origin. Piedmont streams flow into the Installation from the north and flow generally in a southerly direction. Large rocks, pebbles, and sand are characteristic of the substrate of these streams. Piedmont streams are higher in fish and mussel diversity than Coastal Plain streams. Piedmont streams include Dozier, Cox, Randall,

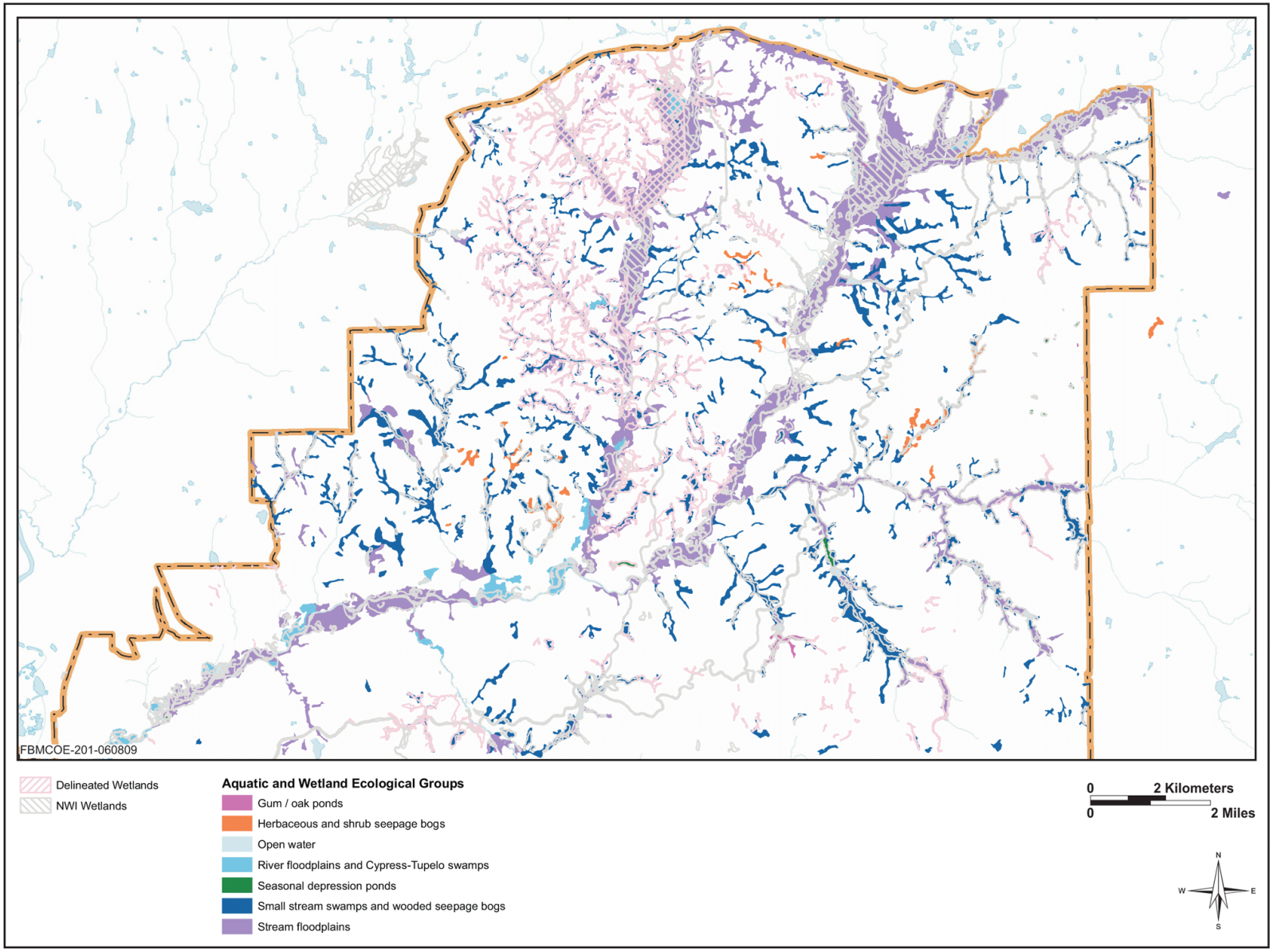


Figure 4.11-3: Aquatic Ecological Groups – Northern Installation

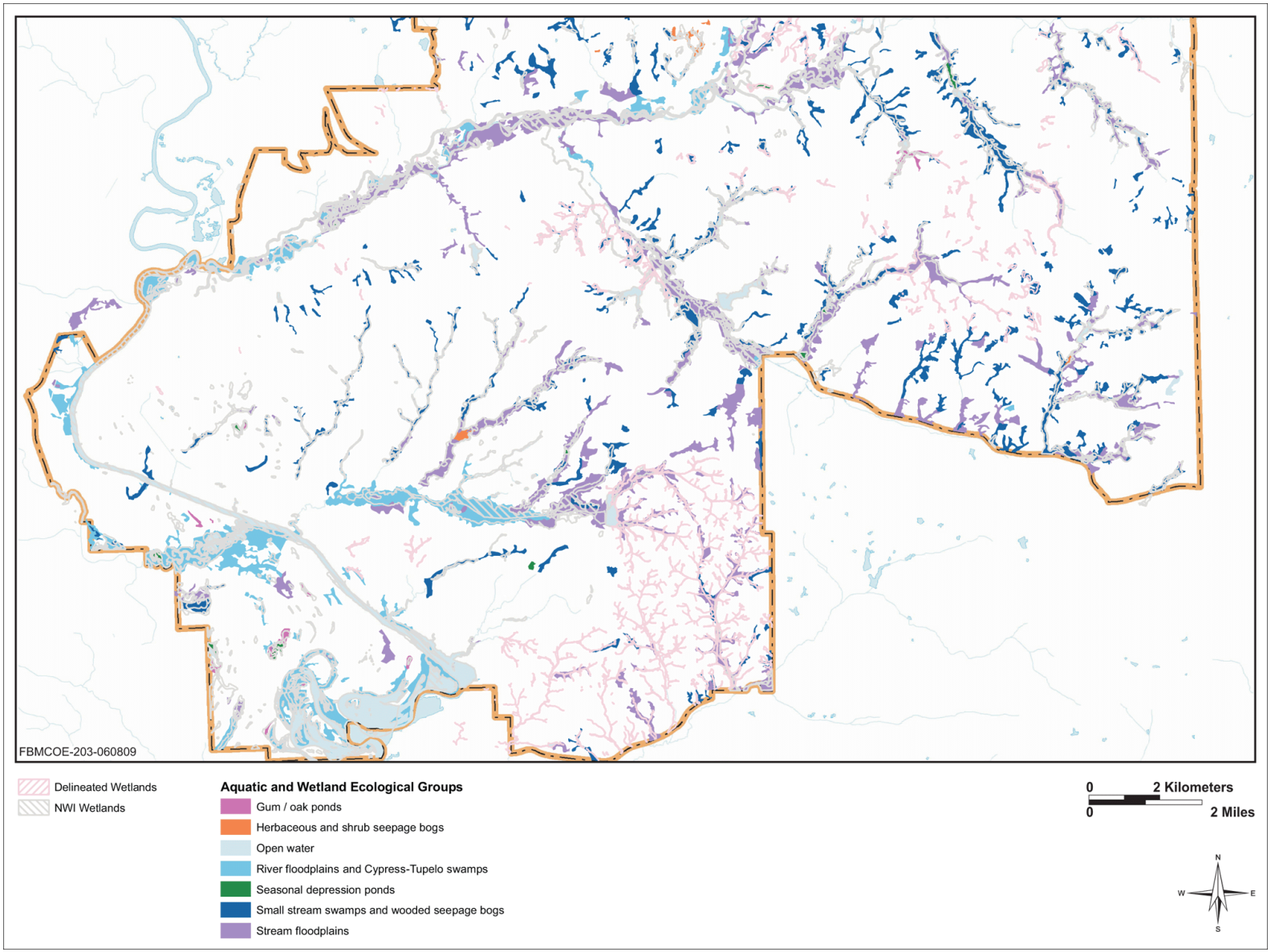


Figure 4.11-4: Aquatic Ecological Groups – Southern Installation

Kendall, Upatoi, Uchee, and Baker Creeks, as well as the Chattahoochee and Tar rivers (the Tar is a tributary of Upatoi Creek). The Upatoi Creek watershed is the main drainage of Fort Benning. Its headwaters are in Chattahoochee, Talbot, and Marion Counties.

Coastal Plain streams (e.g., Pine Knot and Little Pine Knot Creeks) generally flow into the Installation from the east. Coastal Plain streams have more stable water levels and are more acidic than Peidmont streams. Coastal Plain streams also exhibit lower fish and mussel diversity.

Common plants found in open water habitats include white water lily (*Nymphaea odorata*), watershield (*Brasenia schreberi*), pondlily (*Nuphar lutea*), buttonbush (*Cephalanthus occidentalis*), smooth alder (*Alnus serrulata*), and wax myrtle. Special status species that use impounded water sites include lax water-milfoil (*Myriophyllum laxum*). Common inhabitants of impounded water communities include American alligators (*Alligator mississippiensis*), American beavers (*Castor canadensis*), waterfowl, game and nongame fish, and wading birds. Many other game and nongame species use these ponds for drinking water. The larger managed ponds provide recreational fishing opportunities to Installation personnel. The Pine Knot Creek system is designated as a UEA (see Section 4.13.1.5).

Major rivers and open water bodes would not be used for military training under the alternatives, but smaller creeks and tributaries appear in the range areas and heavy maneuver corridors.

River Floodplains and Cypress/Tupelo Swamps

This aquatic community is a frequently inundated alluvial outwash that appears adjacent to larger creeks and rivers. Plant communities here are dominated by flood tolerant species, such as swamp tupelo (*Nyssa biflora*), blackgum (*Nyssa sylvatica*), sweetgum, sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), and water oak. Loblolly pines are scattered along the banks of the river. Common understory species include red maple, ash, elms (*Ulmus* spp.), flowering dogwood, hackberry (*Celtis* spp.), American hornbeam, and various oaks. Vines, understory grasses, and herbaceous plants are common and varied.

The Chattahoochee River floodplain, and its associated backwaters and tupelo swamps, is found in the southwestern portion of the Installation. The floodplain areas provide abundant recreational opportunities to Installation personnel and the general public; military use of the Chattahoochee River floodplain is minimal. Threats to the area and its wildlife include water pollution, water level manipulation, sedimentation, and disturbance of nesting migratory bird species. The proposed alternatives do not occur in the river floodplain, but several non-range construction projects within the Main Post cantonment area are proposed adjacent to the river floodplains.

Stream Floodplains

Stream floodplains at Fort Benning are extensive and the associated plant communities change composition somewhat with geographic location on the Installation. Oaks, hickories, sycamore, beech, ash, and elms dominate the riparian plant communities. Loblolly, shortleaf and spruce pines (*Pinus glabra*) are scattered throughout these communities. Common understory species include red maple,

flowering dogwood, hawthorn, sourwood, silverbells (*Halesia* spp.), witchhazel, redbud, American holly, and black cherry (*Prunus serotina*). Relict trillium (*Trillium reliquum*), a federally endangered plant, occurs in at least five populations on the stream floodplains (Section 4.11.1.6). Over 50 species of birds have been documented using these areas. Stream floodplains at Fort Benning often exhibit wetland characteristics and may fall under regulatory jurisdiction of the CWA.

Current military training in the stream floodplains is minimal and a large portion of these areas have been proposed for management as UEAs. The proposed alternatives overlap stream floodplains in some of the range areas and heavy maneuver corridors.

Small Stream Swamps and Wooded Seepage Bogs

Wooded seepage bogs are depressional areas fed by side-slope seepage from the surrounding uplands. Standing water may be present during some parts of the year. The tree bases are usually buttressed, ground-cover diversity is low, and ferns are a common component. Dominant tree canopy species include sweetbay (*Magnolia virginiana*), blackgum, sweetgum, water oak, and willow oak (*Quercus phellos*). Sub-canopy species include holly, farkleberry, red bay, poison sumac (*Toxicodendron vernix*), viburnum (*Viburnum* spp.), and red maple. Understory shrubs include titi, bayberry (*Myrica heterophylla*), leucothoe (*Leucothoe axillaris*), and fetterbush. Understory herbaceous species are sparse, but may include netted chain fern (*Woodwardia areolata*), cinnamon fern (*Osmunda cinnamomea*), and southern lady fern (*Athyrium asplenioides*). Stream swamps and wooded seepage bogs at Fort Benning often exhibit wetland characteristics and fall under regulatory jurisdiction of the CWA.

The braided streams that are characteristic of this group are found scattered across the northern half of the Installation. Current military use of these areas is minimal, usually limited to foot traffic. These habitats are not specifically managed as individual UEAs; however, small steam swamps and seepage bogs may appear as part of other UEAs.

Seasonal Depression Ponds

Seasonal Depression Ponds include several seasonally flooded wetland areas across the Installation. Plant species include smooth alder in deciduous shrubland, rushes (*Juncus* spp.) and sedges in grassland areas, cattails (*Typha* spp.), *Panicum* spp, and *Polygonum* spp. The vegetation and wildlife in these habitats depends on the surrounding environmental conditions, degree and frequency of flooding, and adjacent vegetative community. These small ponds appear infrequently and sporadically across the Installation, typically interspersed with the surrounding ecological community.

Gum/Oak Ponds

Gum/oak ponds are usually small and isolated and usually are found in upland areas where small depressions hold water for long periods of time. The ponds are not filled by running water or seepage; instead, they hold rainwater, and the water levels change with the season. Sweetgum, blackgum, water tupelo (*Nyssa aquatica*), willow oak, laurel oak (*Quercus laurifolia*), and water oak are often dominant species. The midstory is variable and changes with the amount of water the ponds retain, but American holly, sweet-pepperbush (*Clethra alnifolia*), leucothoe, and dwarf palmetto (*Sabal minor*) commonly are

present. Mesic species such as buttonbush and wax myrtle are common in more open areas of the ponds, and in some ponds sedges and ferns are the most common herbaceous species present. Mosses and orchids may also be present. Gum/oak ponds are dispersed in low volume over the Installation, but are not common in any of the areas subject to the Proposed Action alternatives.

Herbaceous and Shrub Seepage Bogs

The switch cane and pitcher plant bogs within the Malone Impact Area are the best example of this ecological group on Fort Benning. Woody species common to these bogs include switch cane (*Arundinaria gigantea* ssp. *tecta*), inkberry/gallberry, wax myrtle, sourwood, and greenbriers. Herbaceous species include sweet pitcher plant (*Sarracenia rubra*), sphagnum mosses, and various ferns. These areas burn frequently and fire is a necessary component for maintaining these bog systems. A smaller, lower quality bog located in military training compartment O14 has been invaded by woody species due to fire suppression. The herbaceous and shrub seepage bogs in military training compartments O9 and O14 have also been found to include populations of *Saracenia*. These bogs are subject to little military use other than the influence of ordnance-related wildfires.

4.11.2 Environmental Consequences

This section assesses the potential effects of the No Action and Alternatives A and B on water resources. Potential impacts would result from construction of new facilities, changes to training operations, and ongoing operations and maintenance activities across the Installation. Surface-water characteristics, increased impervious surfaces, and storm water flows and their potential effects on surface water quality and quantity are considered.

The threshold level of significance for water resources is defined as any long-term impacts (chemical, physical, or biological effects) that would adversely alter the historical baseline or violate standard water quality conditions. Additionally, project actions adversely impacting a water body currently considered impaired under CWA would be considered significant. For the purposes of this EIS, baseline conditions are those presented in Chapter 3.

4.11.2.1 No Action Alternative

Potentially significant impacts to water resources are not expected as a result of the No Action Alternative by compliance with applicable regulations and permitting requirements including mitigation to offset these impacts. The BRAC/Transformation EIS preferred alternative had approximately 1,285 total acres of total aquatic habitat impacted and 329 acres of wetlands impacted as shown in Tables 4.11-3 and 4.11-4 (USACE 2007a). However, Fort Benning's environmental stewardship efforts seek to ensure that natural resource conservation measures and military activities on Fort Benning mission land and cantonment areas are integrated and are consistent with federal stewardship requirements (Fort Benning 2001). Fort Benning has begun to integrate its INRMP with the Strategic Environmental Research and Development Program (SERDP) to better monitor the ecosystem and respond to environmental issues, concerns, and formal requirements emerging from all DoD services (USACE 2002b). Another important program being implemented at Fort Benning is the ITAM Program, which will be used to monitor land

composition trends and mitigate adverse impacts of the military mission on long-term training land viability (Fort Benning 2001). Programs and initiatives such as these, which would likely continue in the absence of the proposed Fort Benning Transformation, may reduce negative impacts to water resources.

Table 4.11-3: Aquatic Habitats Potentially Impacted by the No Action Alternative

Habitat Type	Range Impacts (Acres)	Range Impacts (%)	Non-Range Impacts (Acres)	Non-Range Impacts (%)	Total Impacts (Acres)	Total Impact (%)
Herbaceous and Shrub Seepage Bogs (440)	74	16.8	8	1.8	82	18.6
Gum / Oak Ponds (217)	0	0.0	0	0.0	0	0.0
Impounded/Flowing Water (2504)	92	3.7	0	0.0	92	3.7
River Floodplains and Cypress-Tupelo Swamps (3825)	10	0.3	13	0.3	23	0.6
Small Stream Swamps and Wooded Seepage Bogs (10,022)	414	4.1	28	0.3	441	4.4
Seasonal Depression Ponds (163)	0	0.0	0	0.0	0	0.0
Stream Floodplains (13,666)	638	4.7	7	0.1	646	4.7
Total (30,837)	**1,228**	**4.0**	**57**	**0.2**	**1,285**	**4.2**

Source: (USACE 2007a).

Table 4.11-4: Wetlands Potentially Affected by the No Action Alternative

Project Type	Wetland Area Impacted (Acres)	Percent Impacted of 16,926 existing acres
Range Projects	311	1.9
Non-range Projects	18	0. 1
Total	**329**	**2.0**

Source: (USACE 2007a).

4.11.2.2 Alternative A (preferred alternative)

The potential for direct and indirect impacts to water resources are analyzed below for the cantonment and range areas. It is important to note that, with the exception of projects slated for FY07 and FY08, complete design information is not yet available. As previously stated, siting projects considerations were made for avoidance and minimization of environmental impacts (including water resources) and construction footprint. However, major redesign changes have occurred to Alternative A since the Draft EIS was made available to the public especially to range and training-related projects to the extent that a reduction in approximately 14, 000 less acres of total land disturbance would occur with this alternative

with associated reductions in impacts to water resources as noted below. The need for the redesign changes were due to anticipated impacts associated with the RCW. Impacts to the RCW and measures to address them are discussed in Section 4.13.2.2. Additional considerations for avoidance and minimization to water resources will be implemented in the final design, construction, and long-term operation and maintenance phases of these projects. Section 4.11.3 addresses these considerations.

Refer to Figure 4.11-2 depicting the proposed alternatives in context of water resources for Alternative A. Tables 4.11-5 thru 4.11-11 list those projects having the potential for direct impacts, defined as where a portion of the potentially disturbed project area (or total disturbance envelope) falls within 25 ft of perennial streams, and indirect impacts, meaning that the impact associated with the project may occur later in time or farther removed from the project but are the result of project implementation. No projects are proposed within 100 ft of the state-designated Chattahoochee River corridor. Minor impacts such as soil erosion within construction sites and deterioration of stream buffers are expected to occur even with properly implemented BMPs and other mitigation measures. For all areas of potential impacts presented below, in the absence of mitigation specified in Section 4.11.4.3 of this document, direct impacts associated with proposed construction and operation activities would result in notable and potentially significant impacts from stream sedimentation, and stormwater runoff.

Harmony Church

Within the Harmony Church cantonment area, 6 projects located within WMUs 19, 23, and 5 have the potential to adversely affect water resources (Table 4.11-5). In the absence of BMPs and adherence to the environmental mitigation measures discussed in Section 4.11.3, stream sedimentation and an increase in storm water runoff would be anticipated to adversely impact Ochillee Creek and its tributaries; Lemert Creek and its tributaries; Heriot Creek; Harps Creek and its tributaries; Mill Creek and its tributaries; Twilight Pond; Victory Pond; Upatoi Creek tributaries; and tributaries to Oswichee Creek. Streams that are anticipated to be directly impacted if Harmony Church cantonment area projects are constructed as proposed would also be susceptible to indirect impact in the absence of the mitigation measures discussed in Section 4.11.3.

Table 4.11-5: Potential Water Source Impacts (Harmony Church Cantonment Area)–Alternative A

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2012	Recreation Center, Harmony Church (PN65246)	28	Tributaries to Ochillee Creek; tributary to Lemert Creek; tributary to Heriot Creek; tributary to Harps Creek; Harps Creek; tributaries to Oswichee Creek; tributaries to Mill Creek; and Mill Creek	Twilight Pond; Victory Pond; Lemert Creek; Ochillee Creek; tributaries to Heriot Creek; tributaries to Lemert Creek; Harps Creek; tributaries to Harps Creek; Mill Creek; tributaries to Mill Creek; tributaries to Oswichee Creek; tributaries to Upatoi Creek	19, 23and 5
2012	Physical Fitness Center with Pool (PN65248)	39			
2012	Rail Loading Facility Expansion (PN62953)	134			
2009	Troop Store (PN71065)	6			
2009	Shop 1 Maintenance Facility (PN65322)	10			
2009	DS/GS Vehicle Maintenance Facility (PN64460)	36			

Sand Hill

Within the Sand Hill cantonment area, nine projects all located within WMU 5 would potentially directly affect water resources although there are eleven total projects in the Sand Hill cantonment area. Impacts associated with the implementation of proposed projects in the Sand Hill cantonment area would be similar to those discussed for the Harmony Church cantonment area (Table 4.11-6).

Streams that are anticipated to be directly impacted, if Sand Hill cantonment area projects are constructed as proposed, would also be susceptible to indirect impact in the absence of the mitigation measures discussed in Section 4.11.3 of this document.

Table 4.11-6: Potential Water Source Impacts (Sand Hill Cantonment Area)–Alternative A

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Trainee Complex Upgrade (PN69147)	81	Opossum Creek; Upatoi Creek and its tributaries; Steam Mill Creek; and Tiger Creek	Opossum Creek; Upatoi Creek and its tributaries; Steam Mill Creek; and Tiger Creek and its tributaries	5
2010	Classrooms with Battalion Dining Facilities (PN70027)	72			
2010	Blood Donor Center (PN64881)	12			
2010	Classrooms with Battalion Dining Facilities (PN70026)	50			
2010	Classrooms and Dual Battalion Dining Facilities (PN69150)	66			
2010	Training Barracks Complex, Phase 1 (PN72322)	131, Note 1			
2011	Training Barracks Complex, Phase 2 (PN72324)				
2011	Training Dining and Classroom Facilities, Phase 2 (PN72456)	Note 2			
2011	Training Dining and Classroom Facilities, Phase 2 (PN72457)	Note 3			
2012	Training Barracks Complex, Phase 3 (PN69745)	Note 1			
2013	Chapel (PN65249)	0			

Note 1: Both PN72324 and PN69745 occur at the same location as PN72322.
Note 2: PN72456 occurs at the same location as PN70026.
Note 3: PN72457 occurs at the same location as PN70027.

Main Post

The Main Post is located on the banks of a portion of the Chattahoochee River that is considered impaired by the GEPD. Impacts associated with the implementation of the Transformation action in the Main Post cantonment area would be similar to those discussed for the Harmony Church cantonment area. Strict adherence to all applicable NPDES permits and Georgia's stream buffer rules would be required to ensure no significant impacts and that no additional stream impairment from sedimentation and fecal coliform occurs within the Chattahoochee River.

Six proposed projects for construction from 2009 through 2010 are anticipated to disturb approximately 655 acres of land in the Main Post (Table 4.11-7). In the absence of BMPs and adherence to environmental mitigation measures as discussed in Section 4.11.3, stream sedimentation and an increase in storm water runoff would be anticipated to adversely impact a tributary to Chattahoochee River; a tributary to Hamlet Creek; Laundry Creek and its tributaries; Upatoi Creek and its tributaries; Armory Creek; and Gilbert Creek.

Table 4.11-7: Potential Water Source Impacts (Main Post Cantonment Area)–Alternative A

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Hospital Replacement (PN70235)	137	Upatoi Creek and its tributaries; tributary to Hamlet Creek; Laundry Creek; and Gilbert Creek	Tributary to Chattahoochee River; tributary to Hamlet Creek; Laundry Creek and its tributaries; Upatoi Creek and its tributaries, Armory Creek; and Gilbert Creek	5 and 24
2009	Warrior in Transition (PN69999)	46			
2010	Battle Lab Maneuver (PN65250)	27			
2010	Water Treatment Plant Upgrade and Expansion (PN71473)	47			
2010	Dining Facility to Support AST Training (PN69151)	10			
2010	Dental Clinic Addition (Bernheim Site) (PN71620)	0			

Kelley Hill

Within the Kelley Hill cantonment area, no new construction would occur with only minor infrastructure improvements undertaken; therefore, no additional assessment is required.

Ranges North of U.S. Highway 27/280

There are numerous range facilities proposed north of U.S. Highway 27/280 within WMUs 3 and 4. The Oscar Range Complex would include two 10-acre Fire and Movement Ranges; two Modified Record Fire Ranges; and three 1-acre Rifle/Machinegun Zero Ranges (Table 4.11-8). Water resources in the vicinity of the proposed Oscar Range Complex range facilities include Dozier Creek, Randall Creek, and their tributaries. Soils found within the boundaries of the Oscar Range Complex consist largely of loamy sand and sand loam and are highly susceptible to erosion once disturbed.

Table 4.11-8: Potential Water Source Impacts (Ranges North of U.S. Highway 27/280)–Alternative A

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
			Ochillee Creek; tributaries to Randall Creek; Randall Creek; tributaries to Upatoi Creek; tributaries to Ochillee Creek; Dozier Creek; Halloca Creek; Sally Branch; Bonham Creek; Clear Creek; Little Pine Knot Creek; and tributaries to Bull Creek	Ochillee Creek; tributaries to Randall Creek; Randall Creek; tributaries to Upatoi Creek; tributaries to Ochillee Creek; Dozier Creek; Hedley Creek; tributaries to Cox Creek; Wolf Creek and its tributaries; and tributaries to Bull Creek	19, 8, 23, 9, 11, 12, 14, 16, 17, 18, 3, 10, and 4
2009	Modified Record Fire 1(MRF1) (PN65043)	59			
2009	Modified Record Fire 7 Range-MRF7 (PN65049)	38			
2009	Drivers Training Access Course and Access Roads (PN64797)	18			
2009	Vehicle Recovery Course (PN72017)	192			
2009	Stationary Tank Range ST2 (PN65383)	279			
2009	Basic 10 M – 25 M Firing Range Z1 (PN65035)	23			
2009	Basic 10M – 25M Firing Range Z2 (PN65036)	9			
2009	Basic 10M – 25M Firing Range Z5 (PN65039)	22			
2009	19D/K OSUT Maneuver Area (PN69741)	271			
2009	Northern Training Area Infrastructure (Heavy Mounted Training in L1, L2, and L3) (PN69742)	260			
2009	Southern Training Area Infrastructure (PN65743)	2,936			
2009	Fire and Movement (FM 2) (PN65033)	89			
2010	Fire and Movement (FM 3) (PN65034)	44			

The design process for those ranges proposed for FY08 has begun and, as a result, a more detailed analysis of potential impacts to water resources from these projects will be provided. Construction of the Fire and Movement Range 2 and the Modified Record Fire Range 1 would require the construction of temporary sedimentation basins to meet state sediment and erosion control criteria. There are no "waters of the state" documented to occur within 200 ft of the Modified Record Fire Range, with the exception of an unnamed ditch crossing the entry road (USACE 2006a). The entry road would be crossed at a 90-degree angle with disturbance of 100 linear feet of ditch line. The proposed roadway is exempt from Georgia's SBV. The only "waters of the state" known to occur within 200 ft of the Fire and Movement Range are wetlands which are tributary to Dozier Creek located to the east of the wetlands.

The eastern edge of the Stationary Tank Range (ST2) occurs within WMUs 3, 8, and 10 is an FY09 project. Potential impacts to water resources that would result from the unmitigated construction and ongoing operation of these ranges include notable increases in sediment loading into Upatoi Creek, its tributaries, and other downstream water resources. Soils found within the boundaries of the stationary tank/fighting vehicle gunnery ranges consist largely of loamy sand and sand loam and are highly susceptible to erosion once disturbed.

In addition to these range facilities, the development and use of the Heavy Maneuver Area – North to support heavy maneuver training for the Armor School would result in impacts to water resources if not properly mitigated. Disturbance of soils caused primarily by the use of heavy machinery and tanks would increase the likelihood that sedimentation and pollutants would enter water resources by way of storm water runoff. Potential impacts to water resources are of greater concern in the Heavy Maneuver Area – North, given the adjacency to Randall Creek. This maneuver area is located in WMUs 4 and 6. Water crossings would be established at tank trails; there would not be free maneuver training along stream banks. A relatively large area is identified for heavy/repeated free maneuver training in the southeastern corner of the maneuver corridor adjacent to Randall Creek. Specific requirements would need to be followed for any SBV during the implementation of this project.

Tributaries just to the northwest of this maneuver area empty into Bull Creek (located to the west of the Installation boundary), which is designated by GEPD as "biota impacted" due to increased sedimentation loads from non-point sources. Given drainage patterns (to the interior locations of this maneuver area and to Randall Creek) and mitigation described in Section 4.11.3, establishment and ongoing use of the Heavy Maneuver Area – North would not be expected to affect Bull Creek, its impaired status, or TMDLs.

There are fewer water resources that would potentially be impacted as a result of establishment and ongoing operation and maintenance of the Heavy Maneuver Corridor - South area. As with the Heavy Maneuver Area – North, stream banks would not be used for heavy maneuver. The heavy/repeated impact within this maneuver corridor would occur within WMUs 9, 11, 12, 14, 16, 17, 18, and 19. The easternmost branch of the Heavy Maneuver Corridor - South would cross Little Pine Knot Creek. The westernmost branch of the maneuver corridor includes crossings for Bonham Creek and tributaries of Ochillee Creek. The free maneuver area would be to the north and south of these stream crossings. The existing trail would be reinforced and upgraded including hardening at the stream crossing to minimize

potential impacts to water resources, both at the stream crossing and at down-gradient waters. The down-gradient portion of Little Pine Knot Creek is listed as partially supporting fishing uses; it is considered 'biota impacted' caused by sediment non-point/unknown sources. Prevention of further impairment of Little Pine Knot Creek may require the development of state-generated TMDL plans must conform to the construction permit specification of incorporating four of the twenty possible BMPs as outlined in the 2008 GEPD rules for construction activities within one mile of an impaired waterbody. The southern portion of the Heavy Maneuver Corridor - South area and the bottom finger (of the 3-fingered corridor) along Hourglass Road proceeding in a westward direction consists of loamy sand and sandy loam soils making these areas susceptible to erosion once disturbed.

The acreage that would be impacted by the development of the Drivers Training Area (to include the Vehicle Recovery Course) in the absence of mitigation measures includes tributaries to the Upatoi Creek. Potential impacts to these water resources would be minimized in the ultimate layout of the roads and obstacles that would comprise this course. Soils found within the boundaries of the Drivers Training Area consist largely of loamy sand, sandy loam, and loamy course sand and are highly susceptible to erosion once disturbed.

Ranges South of U.S. Highway 27/280

The establishment and ongoing operation and maintenance of the Qualification Training Range in the southern ranges have the potential to impact tributaries to Chattahoochee River due to possible increased sediment loads. The portion of the Chattahoochee River down gradient from potentially impacted waters does not support fishing due to TMDL impairment from fecal coliform and urban runoff. Although direct impacts to water resources would be minimized in the design phase for these facilities, impacts to water resources would be expected as a result of vegetation clearing of these range areas, establishment of range facilities, and ongoing impacts from range maintenance and use. With respect to impaired streams, the proposed project may result in increased management practices to ensure that TMDLs for sedimentation are not affected by the Proposed Actions. In the event that sediment levels entering streams exceed regulatory limits, additional watershed management measures that are consistent with the Chattahoochee River Basin Plan would be implemented which may include the development of state-generated TMDL plans (Table 4.11-9). If a TMDL Implementation Plan becomes finalized at least six months before submittal of an NOI for discharges within one mile of that stream, the inclusion of the appropriate BMPs per GEPD's August 2008 NPDES permit requirements for construction activities must be met.

Table 4.11-9: Potential Water Source Impacts (Ranges South of U.S. Highway 27/280)–Alternative A

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Anti Armor Tracking and Live Fire Complex 1 (PN65078)	57	Tributaries to Chattahoochee River; tributary to Red Mill Creek; and tributaries to Oswichee Creek; Hitchitee Creek; Little Hitchitee Creek	Tributaries to Chattahoochee River; tributary to Red Mill Creek; and tributaries to Oswichee Creek; Hitchitee Creek; Little Hitchitee Creek	22
2009	Range Access Road – Good Hope Maneuver Training Area (PN69358)	162			
2009	Good Hope Training Area Infrastructure (PN69668)	4,112			

Water Crossings

Up to 302 new water crossings would be established along the proposed range roads associated with the implementation of Alternative A (see Table 4.11-10). These would include concrete-reinforced tank trail beds established to harden trail paths through water, thus minimizing water quality impacts and referred to as "low water crossings." Construction of the concrete reinforced tank trails would require diversion of streams during the construction phase. Stream diversion BMPs would be followed during this process (these include side slopes no steeper than 2:1, drainage area not to exceed 1-square mile, as detailed in Section 4.11.3). Up to 35 miles of new tank trails would be constructed. The area potentially affected by the establishment of new tank trails is estimated at approximately 500 acres.

Table 4.11-10: Water Crossings Proposed with Alternative A

Project Title	Number of Water Crossings	Water Bodies Crossed
Northern and Eastern Perimeter Tank Trail	19	Dozier Creek; unnamed tributary of Dozier Creek; Randall Creek; Cox Creek; Kendall Creek; Tar River; Upatoi Creek; Kings Mill Creek; Pine Knot Creek; unnamed tributary of Upatoi Creek; and Little Pine Knot Creek
Southern Heavy Maneuver Corridor	0	Sally Branch and Hallaca Creek
Existing Tank Trails (not proposed for road construction or upgrade)	4	Ochillee Creek, Upatoi Creek, and Pine Knot Creek
Good Hope Maneuver Area	165	Oswichee Creek and tributaries; Caney Creek;Stevens Branch; Hitchitee Creek; Little Hitchitee Creek; Hewell Creek; Shell Creek; Smith Branch; Cooke Branch; and Sand Creek
Northern Heavy Maneuver Area	30	Unnamed tributaries of Randall Creek
19 D/K OSUT Maneuver Area	84	Randall Creek; Randall Branch; Bonham Creek and tributaries; tributaries to Upatoi Creek

Significant impacts may occur during construction but would be mitigated if the proper measures are undertaken as described in Section 4.11.3. No significant impacts are anticipated for operations and maintenance if all applicable management plans are developed; federal, state, and Installation regulations are met; and all necessary permits are obtained and implemented.

The greatest potential for effect to water resources from heavy maneuver training is increased sedimentation (Table 4.11-11). Soils found within the boundaries of the Good Hope Maneuver Area include sandy clay loam and are as susceptible to erosion. However, the segment of Hitchitee Creek located south of the Installation boundary adjacent to the proposed Good Hope Maneuver Area, is listed as "water quality limited" (i.e. State of GA 305(b)/303(d) listed) or impaired due to sedimentation. This segment of Hitchitee Creek is listed as partially supporting the designated use of fishing. Five maneuver corridors are planned in the Good Hope Maneuver area with water crossings approximately every 300 meters (Figure 4.11-5).

Table 4.11-11: Potential Water Source Impacts (Good Hope Maneuver Area)–Alternative A

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Good Hope Training Area Infrastructure	1,523	Oswichee Creek and its tributaries; Cany Creek; Stevens Branch; Hitchitee Creek; Hewell Creek; Little Hitchitee Creek; Shell Creek; and Sand Creek	Chattahoochee River; Oswichee Creek and its tributaries; Cany Creek; Stevens Branch; Hitchitee Creek; Hewell Creek; Little Hitchitee Creek; Shell Creek; Smith Branch; Cooks Branch and Sand Creek	20, 25
2009	Good Hope Range Access Road	162			

The soils in this area do include soils that are considered highly erodible and subject to release into the nearby creek system. With water crossings every 300 meters, there is a potential for increased loadings of sediment into the Hitchitee and surrounding surface water bodies associated with these crossings in the Good Hope Maneuver Area. With respect to water resource impacts, there is a potential for adverse impacts as a result of implementing Alternative A but these impacts would not be significant with the implementation of the appropriate BMPs including erosion control measures and compliance with GEPD's permit requirements.

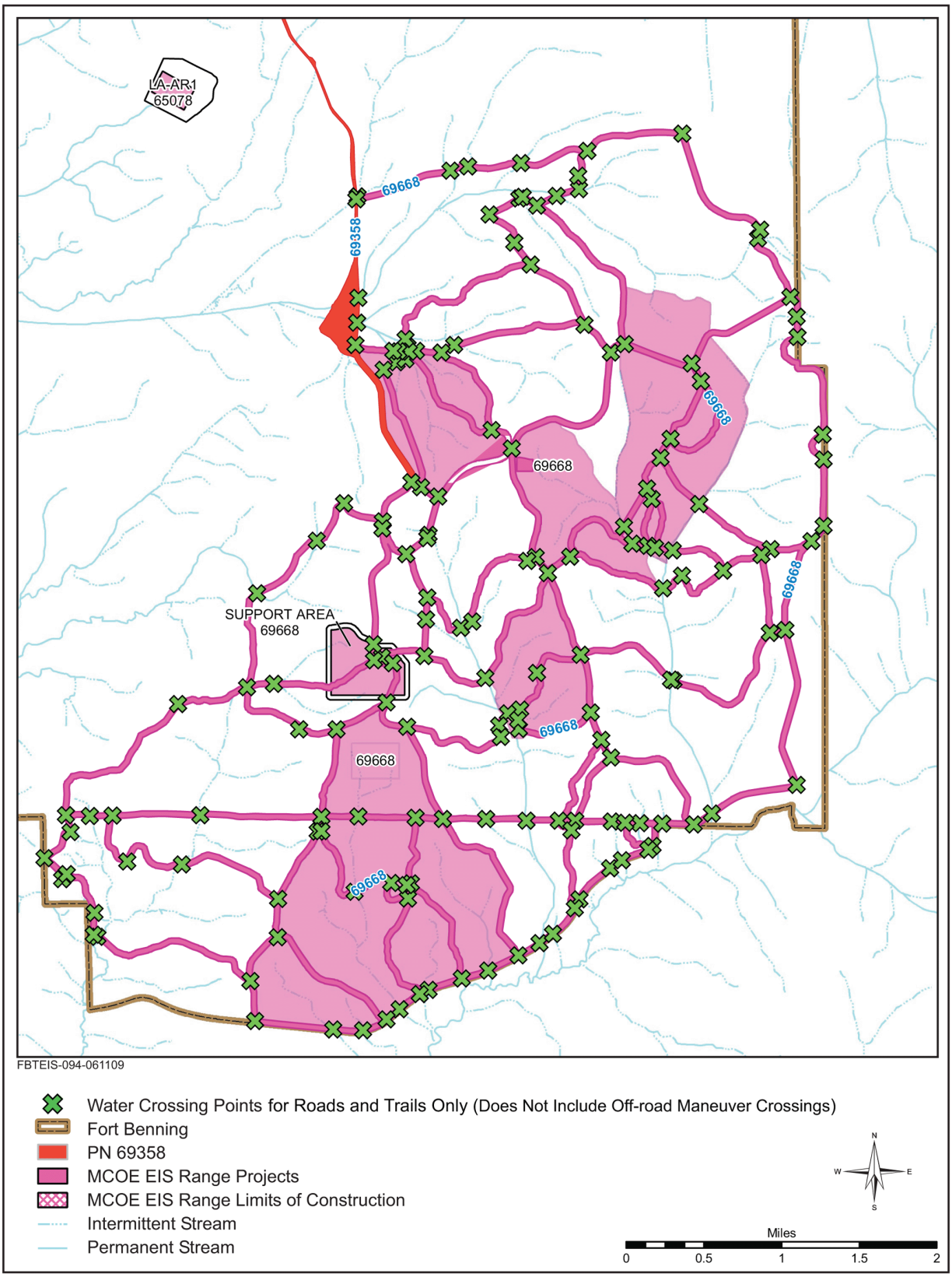


Figure 4.11-5: Water Crossings in the Vicinity of Good Hope Maneuver Area-Alternative A and B

Aquatic Habitats and Wetlands

Impacts to several of the aquatic and wetland habitat types identified in Section 4.11.1.2 would occur as a result of either alternative. Impacts to these habitats may include direct disturbance due to drainage, excavation, and filling to support buildings and pavement, low water crossings, clearing for AT/FP setbacks, construction staging areas, vehicular traffic, and/or foot traffic. Table 4.11-12 lists the acreage of impacted habitats for Alternative A. Indirect impacts may occur downstream due to sedimentation, erosion, channelization, contamination, increased runoff, storm water diversion, and changes in fire regime. Herbaceous and shrub seepage bogs are dependent on a regular fire regime. A decrease in fire frequency would lead to encroachment of woody species; however, the proposed Alternatives are not expected to reduce the fire frequency in this freshwater aquatic habitat. The acreage of previously delineated wetlands affected by Alternative A is listed in Table 4.11-13. Wetlands in the range and training areas were identified from the 2006 wetland delineation (Fort Benning 2006f) and wetlands data for non-range cantonment areas were taken from more recent wetland delineation data (Fort Benning 2008b). The INRMP estimates that Fort Benning contains approximately 16,926 acres of jurisdictional wetlands across the Installation (Fort Benning 2001, 2003a).

Table 4.11-12: Aquatic Habitat Potentially Impacted by Alternative A

Habitat Type (acres)	Range Impacts (Acres)	Range Impacts (%)	Non-Range Impacts (Acres)	Non-Range Impacts (%)	Total Impacts (Acres)	Total Impact (%)
Herbaceous and Shrub Seepage Bogs (403)	0.08	0.02	22.37	6.0	22.45	6
Gum / Oak Ponds (217)	0	0	1.71	1	1.71	1
Impounded/Flowing Water (2,492)	0	0	3.75	0.0	3.75	0
River Floodplains and Cypress-Tupelo Swaps (3,825)	0	0	4.91	0.0	4.91	0
Small Stream Swamps and Wooded Seepage Bogs (9,850)	26.6	0.27	218.96	2	245.61	2
Seasonal Depression Ponds (163)	0	0	0.20	0.0	0.2	0
Stream Floodplains (13,379)	24.95	0.22	480.49	4	509.44	4
Total Impacts on all Aquatic Habitats						
Total (30,329)	**56**	**0.18**	**732**	**2**	**788**	**3**

Table 4.11-13: Wetlands Potentially Impacted by Alternative A

Project Type	Wetland Area Impacted (Acres)	Percent Impacted *of 16,926 existing acres*
Range and Training Area Projects	11.3	0.1%
Non-range Projects	102.4	0.6%
Total	**113**	**0.7%**

The impacted acreages in Tables 4.11-12 and 4.11-13 comprise disturbance envelopes defined by the construction, the boundaries of the proposed ranges, and potentially disturbed areas within the heavy maneuver areas, as well as areas used for construction staging, foot traffic, vehicle storage, and incidental ground disturbance. Within the construction footprints and disturbance envelope, wetland areas would be avoided wherever feasible; the entire area would not be disturbed or developed. In many cases, however, wetlands and freshwater aquatic habitats would require alteration for road crossings, line-of-sight requirements, or construction projects.

Activities would include removing tree stumps and grubbing in some wetlands and filling some wetland areas to construct water crossings and other structures. There are no adverse wetlands impacts when cutting trees for line-of-sight if a low-impact method of tree removal is utilized to minimize soil disturbance and when stumps and roots can be left in place, according to the USACE Regulatory office, Savannah District. In construction areas, however, the trees, including stumps and roots, would need to be removed. Trees and other vegetation along streams provide shade that moderates water temperatures, provide woody debris necessary for aquatic ecosystem health, and provide natural filtration of sediment and other pollutants. Removal of streamside vegetation would result in an adverse impact to wetlands. Some aquatic wildlife species such as fish, salamanders, frogs, and turtles may be directly impacted during construction, as streams are temporarily diverted during emplacement of culverts for maintenance roads and construction of low-water stream crossings. Tree removal along streambanks may have an indirect impact to aquatic species due to increase in temperature from the loss of tree canopy. There would also be a potential loss of feeding and nesting areas for migrating waterfowl and wading birds, in addition to a reduction in spawning, feeding, and nursery habitat for fish and other aquatic species and a temporary fragmentation of their habitat during construction of water crossings (USACE 2007).

A number of creeks would be crossed by road construction and upgrade projects, including Ochillee Creek, Randall Creek, Dozier Creek, and small tributaries. The two Tank/Fighting Vehicle Stationary Gunnery Ranges are proposed over several small tributaries to Upatoi Creek. Several road crossings would be constructed or upgraded at locations on Upatoi Creek tributaries, Kendall Creek, Randall Creek, Pine Knot Creek, Little Pine Knot Creek, and Sally Creek Tributaries. Stream segments in the heavy maneuver areas also would be impacted by vehicle crossings. The impacts of road crossing and construction projects include, but are not limited to, loss of vegetative cover, sedimentation, channelization, turbidity, and degradation of water quality. Erosion and sedimentation would occur on disturbed soils and would adversely affect aquatic organisms and habitat quality in Fall Line streams (Fort Benning 2001, 2003a). Aquatic habitats and wetlands near the cantonment areas could be affected by the increased area of impervious surface that would result from Alternative A. New buildings, roads, and

parking areas would alter the storm water flow regime and increase the discharge into surface waters during storm events. It is likely that project specific Section 404 permits for impacts to streams and jurisdictional wetlands would be required for implementation of some MCOE projects.

Alternative A would result in potential significant effects to aquatic habitats and wetlands, including streambanks. Construction, demolition, road upgrades, and range projects would directly impact up to approximately 902 acres of aquatic habitats and wetlands. Range and non-range projects would impact 788 acres of freshwater aquatic habitat (impoundments and flowing streams) and 3 percent of the total existing aquatic habitat area at Fort Benning. The percentage of wetland habitat impacted would be less than 1 percent for Alternative A. The affected aquatic habitats would not necessarily be eliminated, but their functions and values would be degraded by direct or incidental filling, vegetation removal, alteration of hydrology, and inputs of sediment and pollutants.

Mitigation measures listed in Section 4.11.3 would reduce the extent and severity of impacts, but the residual impacts to aquatic habitats and wetlands would still be significant. Mitigation measures would not avoid or alleviate significant impacts to all aquatic habitats and wetlands, particularly in range areas that cannot be configured to avoid wetlands. Stream crossings, sedimentation, and erosion would degrade natural features and processes of aquatic communities. A substantial area of wetland communities would be lost or decreased, degrading ecosystem functions that include the maintenance of water quality and associated fish and wildlife populations.

4.11.2.3 Alternative B

As with Alternative A, no projects are proposed within 100 ft of the state-designated Chattahoochee River corridor. Implementation of Alternative B has the potential to disturb total of 24,596 acres of land as compared to Alternative A (10,045 acres).

In terms of training assets, 19D/K One Station Unit Training would take place in training areas Q1, Q2, Q3, and Q5, while training areas L1, L2, and L3 would be used for existing maneuver training. Alternative B would also include an Automatic Combat Pistol Qualifications Course south of U.S. Highway27/280 and Multi-Purpose Machine Gun Ranges 1 and 2 (PNs 68733 and 65070). Training within the Vehicle Recovery Course would be the same as originally proposed in the Draft EIS with no reduction in impacts. In Alternative B, the MPTR would be built north of Hastings Range rather than on Hasting Range, as in Alternative A. No reductions in training activities would occur in the Southern Maneuver Area under Alternative B.

Harmony Church

Within the Harmony Church cantonment area, 4 projects located within WMUs 19, 23, and 5 have the potential to adversely affect water resources (Table 4.11-14). In the absence of BMPs and adherence to the environmental mitigation measures discussed in Section 4.11.3, stream sedimentation and an increase in storm water runoff would be anticipated to adversely impact Ochillee Creek and its tributaries; Lemert Creek and its tributaries; Heriot Creek; Harps Creek and its tributaries; Mill Creek and its tributaries; Twilight Pond; Victory Pond; Upatoi Creek tributaries; and tributaries to Oswichee Creek. Streams that

are anticipated to be directly impacted if Harmony Church cantonment area projects are constructed as proposed would also be susceptible to indirect impact in the absence of the mitigation measures discussed in Section 4.11.3.

Table 4.11-14: Potential Water Source Impacts (Harmony Church Cantonment Area)–Alternative B

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Troop Store (PN71065)	27	Tributaries to Ochillee Creek; tributary to Lemert Creek; tributary to Heriot Creek; tributary to Harps Creek; Harps Creek; tributaries to Mill Creek; and Mill Creek	Twilight Pond; Victory Pond; Lemert Creek; Ochillee Creek; tributaries to Heriot Creek; tributaries to Lemert Creek; Harps Creek; tributaries to Harps Creek; Mill Creek; tributaries to Mill Creek; tributaries to Upatoi Creek	19 and 23
2009	Direct Support/General Support Vehicle Maintenance Facility (PN64460)	36			
2009	Shop 1 Maintenance Facility (PN65322)	10			
2012	Physical Fitness Center with Pool (PN65248)	39			
2012	Rail Loading Facility Expansion (PN62953)	134			
2012	Recreation Center, Harmony Church (PN65246)	4			

Within the Harmony Church cantonment area, 4 projects located within WMUs 19, 23, and 5 have the potential to adversely affect water resources. In the absence of BMPs and adherence to the environmental mitigation measures discussed in Section 4.11.3, stream sedimentation and an increase in storm water runoff would be anticipated to adversely impact Ochillee Creek and its tributaries; Lemert Creek and its tributaries; Heriot Creek; Harps Creek and its tributaries; Mill Creek and its tributaries; Twilight Pond; Victory Pond; Upatoi Creek tributaries; and tributaries to Oswichee Creek. Streams that are anticipated to be directly impacted if Harmony Church cantonment area projects are constructed as proposed would also be susceptible to indirect impact in the absence of the mitigation measures discussed in Section 4.11.3.

Sand Hill

Within the Sand Hill cantonment area, several projects are located within WMU 5 that would potentially directly affect water resources. Impacts associated with the implementation of proposed projects in the Sand Hill cantonment area would be similar to those discussed for the Harmony Church cantonment area (Table 4.11-15).

Table 4.11-15: Potential Water Source Impacts (Sand Hill Cantonment Area)–Alternative B

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Trainee Complex Upgrade (PN69147)	65	Opossum Creek; Upatoi Creek and its tributaries; Steam Mill Creek; and Tiger Creek	Opossum Creek; Upatoi Creek and its tributaries; Steam Mill Creek; and Tiger Creek and its tributaries	5
2010	Blood Donor Center (PN64481)	12			
2010	Classrooms with Battalion Dining Facilities (PN70027)	72			
2010	Classrooms with Battalion Dining Facilities (PN70026)	50			
2010	Classrooms and Dual Battalion Dining Facilities (PN69150)	58			
2010	Training Barracks Complex, Phase 1 (PN72322)	155 combined Note 1			
2011	Training Barracks Complex, Phase 2 (PN72324)				
2011	Training Dining and Classroom Facilities, Phase 2 (PN72456)	72			
2011	Training Dining and Classroom Facilities, Phase 2 (PN72457)	50			
2012	Training Barracks Complex, Phase 3 (PN69745)	131			
2013	Chapel (PN65249)	site already disturbed			

Note 1: Both PN72322 and 72324 are on the same 155-acre site.

Main Post

The Main Post is located on the banks of a portion of the Chattahoochee River that is considered impaired by the GEPD. Impacts associated with the implementation of the Transformation action in the Main Post cantonment area would be similar to those discussed for the Harmony Church cantonment area. Strict adherence to all Fort Benning NPDES permits and Georgia's stream buffer rules would be required to ensure no significant impacts and that no additional stream impairment from sedimentation and fecal coliform occurs within the Chattahoochee River. Table 4.11-16 lists the project impacts for water resources in the Main Post cantonment area.

Table 4.11-16: Potential Water Source Impacts (Main Post Cantonment Area)–Alternative B

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Hospital Replacement (PN70235)	137	Upatoi Creek and its tributaries; tributary to Hamlet Creek; Laundry Creek; and Gilbert Creek	Tributary to Chattahoochee River; tributary to Hamlet Creek; Laundry Creek and its tributaries; Upatoi Creek and its tributaries, Armory Creek; and Gilbert Creek	5 and 24
2009	Unit Maintenance Facility (PN69406)	1			
2009	Warrior in Transition Complex (PN69999)	17			
2010	Water Treatment Plant Upgrade and Expansion (PN71473)	47			
2010	Dining Facility to Support AST Training (PN69151)	10			
2010	Maneuver Battle Lab (PN65250)	27			
2010	Dental Clinic Addition (Bernheim Site) (PN71620)	Site already disturbed			

Kelley Hill

Within the Kelley Hill cantonment area, no new construction would occur with only minor infrastructure improvements undertaken; therefore, no additional assessment is required.

Ranges North of U.S. Highway 27/280

There are numerous range facilities proposed north of U.S. Highway 27/280 within WMUs 3 and 4. The Oscar Range Complex would include two 20-acre Fire and Movement Ranges; one 43-acre and four 24-acre Fire and Movement Ranges; and five 1-acre Rifle/Machinegun Zero Ranges (Table 4.11-17). Water resources in the vicinity of the proposed Oscar Range Complex range facilities include Dozier Creek, Randall Creek, and their tributaries. Soils found within the boundaries of the Oscar Range Complex consist largely of loamy sand and sand loam and are highly susceptible to erosion once disturbed.

The design process for those ranges proposed for FY08 has begun and, as a result, a more detailed analysis of potential impacts to water resources from these projects can be provided. Construction of the Fire and Movement Range 2 and the Modified Record Fire Range 1 would require the construction of temporary sedimentation basins to meet state sediment and erosion control criteria. There are no “waters of the state” documented to occur within 200 ft of the Modified Record Fire Range, with the exception of an unnamed ditch crossing the entry road (USACE 2006a). The entry road would be crossed at a 90-degree angle with disturbance of 100 linear feet of ditch line. The proposed roadway is exempt from

Table 4.11-17: Potential Water Source Impacts (Ranges North of U.S. Highway 27/280)–Alternative B

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Multi-Purpose Training Range (MPTR1) (PN64551)	984			
2009	Modified Record Fire 1(MRF1) (PN65043)	24	Ochillee Creek; tributaries to Randall Creek; Randall Creek; tributaries to Upatoi Creek; tributaries to Ochillee Creek; Dozier Creek; Halloca Creek; Sally Branch; Bonham Creek; Clear Creek; Little Pine Knot Creek; and tributaries to Bull Creek	Ochillee Creek; tributaries to Randall Creek; Randall Creek; tributaries to Upatoi Creek; tributaries to Ochillee Creek; Dozier Creek; Hedley Creek; tributaries to Cox Creek; Wolf Creek and its tributaries; and tributaries to Bull Creek	19, 8, 23, 9, 11, 12, 14, 16, 17, 18, 3, 10, and 4
2009	Modified Record Fire 7 Range-MRF7 (PN65049)	24			
2009	Drivers Training Access Course and Access Roads (PN64797)	34			
2009	Vehicle Recovery Course (PN72017)	507			
2009	Fire and Movement (FM 2) (PN65033)	10			
2009	Stationary Tank Range ST2 (PN65383)	676			
2009	Basic 10 M – 25 M Firing Range Z1 (PN65035)	1			
2009	Basic 10M – 25M Firing Range Z2 (PN65036)	1			
2009	Basic 10M – 25M Firing Range Z5 (PN65039)	1			
2009	Training Area Infrastructure – 19D/K OSUT Maneuver Area (PN69741)	872			
2009	Northern Training Area Infrastructure (Heavy Mounted Training in L1, L2, and L3) (PN69742)	Note 1			
2010	Fire and Movement (FM 3) (PN65034)	10			

Note 1: Northern Training Area Infrastructure was analyzed in the BRAC/Transformation EIS (USACE 2007a)

Georgia's SBV. The only "waters of the state" known to occur within 200 ft of the Fire and Movement Range are wetlands which are tributary to Dozier Creek located to the east of the wetlands.

The eastern edge of the Stationary Tank Range (ST2) occurs within WMUs 3, 8, and 10 is an FY09 project. Potential impacts to water resources that would result from the unmitigated construction and ongoing operation of these ranges include notable increases in sediment loading into Upatoi Creek, its tributaries, and other downstream water resources. Soils found within the boundaries of the stationary tank/fighting vehicle gunnery ranges consist largely of loamy sand and sand loam and are highly susceptible to erosion once disturbed.

In addition to these range facilities, the development and use of the Heavy Maneuver Area – North to support heavy maneuver training for the Armor School would result in impacts to water resources if not properly mitigated. Disturbance of soils caused primarily by the use of heavy machinery and tanks would increase the likelihood of that sedimentation and pollutants would enter water resources by way of storm water runoff. Potential impacts to water resources are of greater concern in the Heavy Maneuver Area – North, given the adjacency to Randall Creek. This maneuver area is located in WMUs 4 and 6. Water crossings would be established at tank trails; there would not be free maneuver training along stream banks. A relatively large area is identified for heavy/repeated free maneuver training in the southeastern corner of the maneuver corridor adjacent to Randall Creek. Specific requirements would need to be followed for any SBV during the implementation of this project.

Tributaries just to the northwest of this maneuver area empty into Bull Creek (located to the west of the Installation boundary), which is designated by GEPD as "biota impacted" due to increased sedimentation loads from non-point sources. Given drainage patterns (to the interior locations of this maneuver area and to Randall Creek) and mitigation described in Section 4.11.3, establishment and ongoing use of the Heavy Maneuver Area – North would not be expected to affect Bull Creek, its impaired status, or TMDLs.

There are fewer water resources that would potentially be impacted as a result of establishment and ongoing operation and maintenance of the Heavy Maneuver Corridor - South area. As with the Heavy Maneuver Area – North, stream banks would not be used for heavy maneuver. The heavy/repeated impact within this maneuver corridor would occur within WMUs 9, 11, 12, 14, 16, 17, 18, and 19. The easternmost branch of the Heavy Maneuver Corridor - South would cross Little Pine Knot Creek. The westernmost branch of the maneuver corridor includes crossings for Bonham Creek and tributaries of Ochillee Creek. The free maneuver area would be to the north and south of these stream crossings. The existing trail would be reinforced and upgraded including hardening at the stream crossing to minimize potential impacts to water resources, both at the stream crossing and at down-gradient waters. The down-gradient portion of Little Pine Knot Creek is listed as partially supporting fishing uses; it is considered 'biota impacted' caused by sediment non-point/unknown sources. Prevention of further impairment of Little Pine Knot Creek may require the development of state-generated TMDL plans prior to and after project implementation and must conform to the construction permit specification of incorporating four of the twenty possible BMPs as outlined in the 2008 GEPD rules for construction activities within one mile of an impaired water body. The southern portion of the Heavy Maneuver Corridor - South area and the bottom finger (of the 3-fingered corridor) along Hourglass Road proceeding in a westward direction consists of loamy sand and sandy loam soils making these areas susceptible to erosion once disturbed.

The acreage that would be impacted by the development of the Drivers Training Area (to include the Vehicle Recovery Course) in the absence of mitigation measures includes tributaries to the Upatoi Creek. Potential impacts to these water resources would be minimized in the ultimate layout of the roads and obstacles that would comprise this course. Soils found within the boundaries of the Drivers Training Area consist largely of loamy sand, sand loam, and loamy course sand and are highly susceptible to erosion once disturbed.

Ranges South of U.S. Highway 27/280

The establishment and ongoing operation and maintenance of the Qualification Training Range in the southern ranges and associated heavy use impact area have the potential to impact tributaries to Chattahoochee River (Table 4.11-18). The portion of the Chattahoochee River down gradient from potentially impacted waters does not support fishing due to TMDL impairment from fecal coliform and urban runoff. Although direct impacts to water resources would be minimized in the design phase for these facilities, impacts to water resources would be expected as a result of vegetation clearing of these range areas, establishment of range facilities, and ongoing impacts from range maintenance and use. With respect to impaired streams, the proposed project may result in increased management practices to ensure that TMDLs for sedimentation are not affected by the proposed actions. In the event that sediment levels entering streams exceed regulatory limits, additional watershed management measures that are consistent with the Chattahoochee River Basin Plan would be implemented which may include the development of state-generated TMDL plans. If a TMDL Implementation Plan becomes finalized at least six months before submittal of an NOI for discharges within one mile of that stream, the inclusion of the appropriate BMPs per GEPD's August 2008 NPDES permit requirements for construction activities must be met.

Table 4.11-18: Potential Water Source Impacts (Ranges South of U.S. Highway 27/280)–Alternative B

Project FY	Project Title	Total Potentially Affected Area (in acres)	Potential Direct Impacts to Water Resources	Potential Indirect Impacts to Water Resources	WMUs
2009	Anti Armor Tracking and Live Fire Complex 1 (PN65078)	13	Tributaries to Chattahoochee River; tributary to Red Mill Creek; and tributaries to Oswichee Creek	Tributaries to Chattahoochee River; tributary to Red Mill Creek; and tributaries to Oswichee Creek	22
2011	Multi-Purpose Machine Gun 2 – 7.62mm and .50 Cal (PN65070)	238			
2009	Range Access Road – Good Hope Maneuver Training Area (PN69358)	166			
2009	Good Hope Training Area Infrastructure (PN69668)	1677			
2009	Southern Training Area Infrastructure (PN69743)	583			
2009	19D/K OSUT (Heavy Mounted/Dismounted training in TA-Q1, TA-Q2, Q3, and Q5)	872			
2010	Multi-Purpose Machine Gun 1-7.62mm & .50 Cal (PN68733)	238			
2010	Automated Combat Pistol Qualification Course (PN65079)	1			
2011	Multi-Purpose Machine Gun 2-7.62mm & .50 Cal (PN65070)	238			

Aquatic Habitats and Wetlands

Impacts of Alternative B on aquatic habitats are summarized in Tables 4.11-19; the acreage of wetland impacts is shown in Table 4.11-20. Impacts would be greater than Alternative A due to the larger amount of land disturbance associated with Alternative B. As with Alternative A, mitigation measures listed in Section 4.11.3 would reduce the extent and severity of the impacts.

Table 4.11-19: Aquatic Habitat Potentially Impacted by Alternative B

Habitat Type	Range Impacts (Acres)	Range Impacts (%)	Non-Range Impacts (Acres)	Non-Range Impacts (%)	Total Impacts (Acres)	Total Impact (%)
Herbaceous and Shrub Seepage Bogs (403)	90	22.3%	0	0.0%	90	22.3%
Gum / Oak Ponds (217)	6	2.7%	0	0.0%	5.9	2.7%
Impounded/Flowing Water (2,492)	43	1.7%	0.7	0.0%	43.85	1.8%
River Floodplains and Cypress-Tupelo Swamps (3,825)	280	7.3%	0.9	0.0%	281.13	7.3%
Small Stream Swamps and Wooded Seepage Bogs (9,850)	686	7.0%	3.5	0.0%	689.34	7.0%
Seasonal Depression Ponds (163)	3	7.0%	0	0.0%	3	1.8%
Stream Floodplains (13,379)	822	6.1%	30.1	0.2%	852.24	6.4%
Total (30,330)	**1,931**	**6.4%**	**35.3**	**0.1%**	**1,965**	**6.5%**

Table 4.11-20: Wetlands Potentially Affected by Alternative B

Project Type	Wetland Area Impacted (Acres)	Percent Impacted of 16,926 existing acres
Range Projects	886	5.2
Non-range Projects	13.6	0.1
Total	**899.6**	**5.3**

4.11.3 Mitigation Measures

Mitigation measures for water resources that would be applied for all alternatives that are identified for the planning and design phase, construction phase, and operation and maintenance phases below. In addition to the low-water crossings and stream-buffer BMPs, implementation of these mitigation measures would minimize adverse impacts to water resources. These mitigation measures, when implemented, could result in project specific offset of significant impacts during construction as well as during military operations due to increased soil erosion and sedimentation.

Mitigation through Planning, Design, and Construction

Many of the potential impacts to water resources will be minimized or avoided in the planning, design, and associated permitting processes for proposed projects.

Implementation of proposed projects having the potential to disturb 1 acre or more of land would require coverage under Georgia DNR NPDES General Permits 100001, 100002, or 100003. An ESPCP would be developed prior to construction activities as required by the NPDES permit. The ESPCP must be prepared, designed, and signed by a design professional with a GA NPDES Level II Training. Personnel qualified through GA NPDES Level 1A training are required to be on site during construction activities.

During the construction phase, an NOI for construction-related storm water discharge must be obtained from the GEPD for those construction activities including infrastructure/linear projects covered under Georgia DNR NPDES General Permits 100001, 100002, and 100003. Projects not covered under the Georgia DNR NPDES General Permits are covered under the NPDES MS4 permit requirements that must be adhered to by contractors. Operators and contractors must follow and implement all requirements identified in the NPDES permit including the ESPCP during the construction phase. Contractors and operators are required to ensure that permanent or temporary stabilization of previously disturbed soils in place within 14 days of project completion. If the contractor or operator returns to the construction site within the initial 14 days to conduct some additional land disturbing activities, the timeframe in which stabilization is required may be extended by 7 days.

Implementation and operation of the proposed project would require compliance with NPDES MS4 Permit conditions and associated SWMP including the monitoring of activities conducted within the Installation boundary. It is the monitoring of the NPDES MS4 and the SWMP that will help to ensure that illicit discharges are prohibited and that pollutants entering into waterways from construction and maintenance facilities are prevented, reduced, or minimized. SPCC requirements must be adhered to during construction activities as well as during operations of the newly constructed facilities. Proper design of the facilities under SPCC (40 CFR 112) would help to make certain that no illicit discharges from the facility would adversely impact the surface and/or ground water. Failure to comply with the NPDES MS4 permit conditions and SPCC requirements would result in a greater probability of illicit discharges entering into waterway from construction sites. Some of the support facilities with latrines and their associated septic systems and drainage fields may result in the indirect deposition of pollutants into the groundwater and possibly even the adjacent streams if the latrines are not operating properly. The NPDES construction permit and NPDES MS4 permit would be used to mitigate water resource impacts.

As part of the NPDES permit, Fort Benning would update its existing SWMP to include projects in the planning stages of construction and operation. As the site specific ESPCP for each project is being developed, BMPs designated to minimize pollution through source control including rock check dams, rock channels, sediment basins, diversions, and the placement of silt fence and erosion control practices must be considered on a project by project basis. The ESPCP is modified in instances of notable change in site design, construction, or maintenance operations. BMPs that may be identified in the NPDES permit include good housekeeping measures to control soil erosion, reduce the amount of runoff, and to

prevent or minimize stormwater pollution. These typically include measures such as installation of double row type C silt fencing prior to any land disturbing activities, dust control measurements, and off-site vehicle tracking control, proper waste disposal at the site, and site sanitation to be implemented during land disturbance and/or construction activities. The contractor and/or proponent are responsible for the cleanup of any hazardous material/waste or chemical spills. BMPs for land disturbing and/or construction activities, including road improvements must:

- be designed in accordance to the Manual for Erosion and Sediment Control in Georgia;
- protect all storm water drainages near the work area that would be affected from runoff during storm events;
- comply with SPCC requirements as outlined in AR 200-1 when handling hazardous materials/waste within a construction site;
- prevent discharges of wastewater into storm drains; and
- collect wastewaters for proper disposal, and/or coordinate with CWW to ensure operations would not affect plant operators if wastewaters were discharged into sewer lines.

An application to GEPD for SBV is required to conduct land disturbing activities within state mandated 25-ft stream buffers in accordance with the Erosion and Sedimentation Act of 1975. This requirement includes projects that involve the construction or repair of a structure which by its nature must be located within the buffer; or recreational foot trails and viewing areas. Within 60-days of receipt of a completed SBV application, GEPD will either provide written comments to the applicant or propose to issue a variance with approved mitigation. Some of the stream crossings will require application for SBV depending on the existing conditions at each location. Those areas that will require a SBV will need prior approval from GEPD before construction or land disturbance activities are initiated.

Applicable management practices that may be used to help reduce and/or maintain the average annual sediment loads include:

- compliance with the requirements of the Georgia NPDES permit program;
- implementation of Georgia Forestry Commission BMPs for forestry;
- NRCS Conservation Practices;
- adoption of proper unpaved road maintenance practices;
- implementation of ESCPs for land disturbing activities; and
- mitigation and prevention of stream bank erosion due to increased stream flow velocities caused by urban runoff (GEPD 2003a and Fort Benning 2004).

Management practices recommended by Georgia DNR, and followed by Fort Benning, to reduce and/or maintain the average annual fecal coliform is similar to those for sediment loads and include:

- compliance with NPDES permit limits and requirements;
- adoption of NRCS Conservation Practices; and
- application of BMPs appropriate to agricultural or urban land uses, whichever applies (GEPD 2003b).

It is likely that project-specific Section 404 permits for impacts to jurisdictional wetlands and streams would be required for implementation of some of the MCOE projects. The project-specific mitigation measures to reduce or minimize any impacts in water resources and protect waterways would be specified by the USACE as conditions of permit approval. A violation of the Section 404 permit would occur if mitigation measures mandated in the permit are not fulfilled. Specific requirements would need to be followed if there are any stream buffer variances. Field verification of "state waters" would be required during the design phase of all proposed MCOE projects. Any proposed land disturbing activity within a 25-ft buffer of a "state stream" would require a GEPD SBV. Application for a SBV must include an approved ESPCP. Restrictions on the encroachment of riparian stream buffer apply to project construction and operation activities, as well as for timber removal within the 25-ft buffer.

Management of storm water at industrial facilities includes the implementation of General Permit 000000 requirements for industrial facilities and the development and utilization of the SWP3. Surface water resources are subject to contamination from oil spills, pesticide residue, and untreated sewage bypasses. These potential contamination sources are controlled and minimized; however, by implementation of the ISPC and SWP3 (General Permit No. 000000), by sewage bypass reduction efforts, and by the related NPDES permit requirements to prevent sewage bypasses. Installation requirements to comply with the provisions of the Clean Water Act and state regulations to storm water prevention are stipulated in AR 200-1. The SWP3 provides protection for the water sources of Fort Benning by monitoring storm water discharge and implementing BMPs (Fort Benning 2006).

Fort Benning's SPCC Plan applies to new or redesigned facilities such as vehicle maintenance facilities, facilities used to store hazardous materials in containers larger than 55 gallons, and/or the use of underground storage tanks, and/or above ground storage tanks. All maintenance and chemical storage areas would require proper design to ensure that no illicit discharges from the facilities would come in contact with surface and/or ground waters. All new storage areas for hazardous materials, chemicals, or wastes should be designed to allow for secure product storage and to provide secondary containment as per AR-200-1 and 40 CFR 112. This would also meet CWW Ordinance No. 83-101 as well as future Fort Benning NPDES MS4 SWMP requirements.

Management of storm water at the Installation level would be accomplished by implementing Fort Benning's NPDES MS4 permit for military Installations and the SWMP. Construction site run off and post-construction storm water management are MCM required under the MS4 permit (GAG4800000, Oct., 2008). Installation units would be required to follow MCM under MS4 for all storage areas within industrial areas, living quarters, parking areas, and other day-to-day operations. Under the Phase II NPDES MS4 requirements, activities constructed within the Installation boundary would be monitored to help ensure illicit discharges are prohibited and that pollutants from small construction or maintenance activities are prevented, reduced, and/or minimized to meet Fort Benning standards as per the SWMP. Good housekeeping measures for regular maintenance activities for municipal operation are also addressed by the SWMP. These would prevent and minimize water quality impacts within the Installation and meet NPDES requirements. Fort Benning has been regulated under Georgia DNR NPDES MS4 Phase II since August 2003; however, this permit still has not been finalized by GEPD.

Basic requirements are being implemented at the Installation level as part of the basic AR 200-1 requirements. Adherence to NPDES requirements ensures that all wastewater from dining/kitchen/ bathrooms/shower facilities and other operation requiring potable water are connected to the sanitary sewer system, not the storm water sewer system. Coordination with CWW is required for Sanitary Sewer and Sewage Disposal Ordinance requirements, particularly to meet Ordinance No. 83-101 Section 7 for management of fat, oils, grease, and to meet Fort Benning MS4 NPDES Permit GAG480000 requirements. Good management practices and maintenance of grease/oil collection sumps are to be implemented at all times to prevent or minimize sanitary sewer overflow to meet Fort Benning requirements.

For projects that are not covered under the NPDES General Permits 100001, 100002, or 100003, due to less than 1 acre being disturbed, Fort Benning uses a basic ESPCP similar to the one required under General Permits 100001 Part IV. Projects that are not subject to NPDES permit would not be covered under a state permit but preparation and implementation of such a plan should protect all water resources from sediment and other pollution.

Areas where drainage is anticipated to be a problem should be identified during the planning stages of a proposed project. Projects proposed in areas identified as having the potential for drainage issues may require additional requirements during and after maintenance or construction activities to manage storm water runoff outside of the actual project boundary; to include measurements to prevent and minimize water quality impacts after construction ends. These may include but are not limited to: evaluation and design of new and existing drainage systems to ensure proper capacity, LID considerations, storm water runoff watershed protection, and TMDL plans done by the state.

Operation and Maintenance Mitigation

Surface water resources continue to be subject to contamination from soil sedimentation, oil spills, pesticide residue, and untreated sewage bypasses. These potential pollution sources are controlled and minimized by implementation of SPCC, ISCP, and SWP3 (General Permit No. 000000) for industrial facilities, ESPCP and SWMP, NPDES MS4 (Permit No. GAG480000), by sewage bypass reduction efforts, and by the related NPDES permit requirements to prevent sewage bypasses under the CWW NPDES permit for their WWTP and pretreatment facilities. The SWP3 provides protection for the water sources within the Installation by monitoring storm water discharges and implementing BMPs including inspection of the facilities and maintenance vehicles, awareness of potential circumstances for spills, and selection of smart storage locations. In addition, Fort Benning Environmental Division and/or Range Division personnel will monitor ranges, training areas, and tank trails to determine any needs for erosion control and/or revegetation to maintain and sustain the training areas.

Aquatic Habitats and Wetlands

Adherence to applicable federal, state, and local laws and regulations is required. This would include potential disturbance to jurisdictional wetlands and streams and obtaining and following Section 404 permits due to and obtaining stream buffer variances for tree removal and construction within the 25-ft

buffer along streams. The actions under this alternative also would require applications for Section 401 state water quality certifications in conjunction with Section 404 permit applications. The following measures also are required:

- Mitigation measures for soils (Section 4.12.3) are also required to reduce erosion, sedimentation, and potential contaminant impacts on aquatic habitats and wetlands.
- Mitigation for impacts to wetlands by avoidance would be incorporated into the design process by reducing stream crossings and placing trails, roads, and targets, where possible, out of wetland areas. The boundaries of wetland areas would be marked with flagging or painted trees to indicate the limits of construction.
- Unavoidable impacts to wetlands would be compensated by habitat restoration or by purchase of wetlands credits through nearby mitigation banks, such as the Kolomoki Mitigation Bank and the Upatoi Creek Mitigation Bank. Mitigation at Kolomoki Mitigation Bank will restore, enhance or preserve the bottomland hardwood and cypress/blackgum forests and to restore the natural stream conditions that existed before the area was developed for agriculture. Mitigation activities will include: restoring natural stream conditions by removing dams and culverts, planting mast producing species in areas that have been timbered or flooded, and replacing monocultures of young red maple and sweetgum by thinning and planting more desirable hardwood species such as blackgum, cypress, ash, and oak. The Upatoi Creek Mitigation Bank, established in September 2006, will stabilize streams and restore riparian areas by planting native vegetation and plugging ditches to restore the natural hydrologic regime. In addition, wetland enhancement will occur through plugging ditches, eliminating adverse land use practices (i.e., river snagging), and planting with native vegetation.
- Low impact methods of tree clearing would be utilized adjacent to streams, streambank buffer zones and jurisdictional wetlands and streams in accordance with the Georgia Forestry BMPs for Water Quality and Timber Harvesting. Streambank buffer zones and wetland areas would be re-marked with paint and/or flagging after timber operations that are likely to destroy, trample, or otherwise obscure the markings.
- All harvested trees should be felled so the stem is parallel with the run of the stream and therefore reducing the obstruction effect.
- Logging decks and defined skid trails would be located outside streambank buffer zones.
- Consistent with the INRMP (e.g., Section 8.2.4), a program to monitor and sustain the integrity and health of aquatic and wetland ecosystems on Fort Benning will be developed.

Avoidance and mitigation measures would reduce the extent and severity of the adverse impacts. Mitigation measures would not avoid impacts to all aquatic habitats. Stream crossings, sedimentation, and erosion would degrade natural features and processes of aquatic habitats and wetlands however, these are not considered significant impacts with the application of appropriate mitigation measures.

4.12 GEOLOGY AND SOILS

4.12.1 Affected Environment

The affected environment for geology and soils analyses includes Fort Benning and lands adjacent to the Installation that could be directly and/or indirectly impacted by soil erosion and sedimentation.

Geologic and Topographic Conditions. Most of Fort Benning is located south of the Fall Line, which is defined by the overlap of Coastal Plain strata on top of Piedmont rocks. There is, however, a small area of the Piedmont Province located in the northeastern part of the Installation. Along the Fall Line Sandhills, crystalline rocks of the Piedmont are overlain by marine or fluvial sediments, resulting in varied topography. The sedimentary sequences of the Coastal Plain that overlie the crystalline basement rocks at Fort Benning consist of materials deposited during the Cretaceous, Tertiary, and Quaternary Periods. The Cretaceous Period sediments form the uplands and consist of the five following geologic formations (Fort Benning 2001). Table 4.12-1 below provides a general description of each of these formations.

The topography across the Installation is variable, with generally flat areas along the Chattahoochee River and steeper upland slopes farther inland. Elevations on Fort Benning range from about 170 to 750 ft above mean sea level (Fort Benning 2001).

Soils. Soils found within Fort Benning are highly weathered Ultisols, mostly of Coastal Plain origin but with some minor inclusion of alluviums derived from the Piedmont ecological unit, which occur in the northeastern portions of the Installation (Garten and Ashwood 2004). Ultisols are strongly leached, acid forest soils with relatively low native fertility. They are found primarily in humid temperate and tropical areas of the world, typically on older, stable landscapes. Ultisols have a subsurface horizon in which clays have accumulated, often with strong yellowish or reddish colors resulting from the presence of ferric oxides. The upland Piedmont soils in this region are typically highly eroded and often only subsoil remains (Fort Benning 2001).

Within the Installation, soils have been categorized into six soil associations. A soil association is a group of related soil series that generally occur in a characteristic pattern of landscapes that have identifiable topographic features, slopes, and parent materials. Soil series is a group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement. The major soil associations found within the Installation include the Nankin, Orangeburg-Norfolk-Ailey, Riverview-Chewacla-Chastain, Vaucluse-Lakeland, Vaucluse-Orangeburg-Lakeland-Ailey, and Wagram-Troup-Norfolk-Lakeland (Fort Benning 2001).

Table 4.12-1: Geologic Formation Descriptions

Geologic Formation	General Description
Ripley Formation	Fine to very fine, calcareous quartz sand, massive burrowed to bioturbated, greenish-gray, weathers to dusky yellow, contains abundant muscovite, glauconite, and locally abundant carbonaceous debris; local clean quartz sand lenses. Ledge-forming, carbonate-cemented sand beds and calcareous concretions are common in upper part of unit. Thickness ranges from 133 to 250 ft. The Ripley Formation is found only along the southeastern boundary of Fort Benning. This area is also where the highest elevations on the Installation are found.
Cusseta Sand	Medium to coarse quartz sand, pale yellow to light olive gray, thinly bedded to laminated clay, medium olive-gray to brownish-black, and micaceous fine sand, light olive-gray. Formation thickness ranges from 150 to 233 ft.
Blufftown Formation	Fine sand to sandy clay, calcareous, glauconitic, and micaceous, light brownish-gray to olive-gray, interfingers with medium to coarse sand, quartzose, pale yellow. Locally abundant carbonaceous debris, shell beds, and calcareous concretions. Formation thickness ranges from 200 to 433 ft.
Eutaw Formation	Fine to very coarse sand, very pale orange to yellow, and clay, brownish -gray. Thickness of the unit ranges from 100 to 280 ft.
Tuscaloosa Formation	Fine to very coarse sand, pale yellowish-green to pale orange, crossbedded, quartzose and containing abundant potassium feldspar, interbedded with massive sandy clay, pale olive to reddish-brown, locally mottled. Gravelly and poorly bedded deposits at base difficult to distinguish from residuum on underlying crystalline rocks. Thickness ranges from 165 to 500 ft.

Source: Fort Benning 2001.

The northeastern two thirds of Fort Benning consist largely of light-textured soils on a dissected upper Coastal Plain landscape. Sand hills soils are also found in the southeastern portion of the Installation. Upland soils in the sand hills are loamy sands and sands, and on Fort Benning are found on the Tuscaloosa, Eutaw, and Cusseta geologies. Prominent upland soil series are the Ailey loamy coarse sand, Troup loamy fine sand, and Vaucluse sandy loam on the hilltops and Troup, Vaucluse, and Pelion loamy sand on side slopes (Table 4.12-2). All of these soils have sandy surface horizons and loamy subsoils and are highly permeable, droughty, and low in organic matter (Fort Benning 2001).

Soils of the southwestern third of Fort Benning consist of Thermic-Udic-Hapludults and are heavier textured and more mesic than soils of the southeastern portion of the Installation. They generally have higher water holding capacity and higher organic matter content. Predominant series include Cowarts loamy sand and Nankin sandy clay loam (Table 4.12-2) (Fort Benning 2001). A map displaying the soil textures for Fort Benning is provided in Figure 4.12-1.

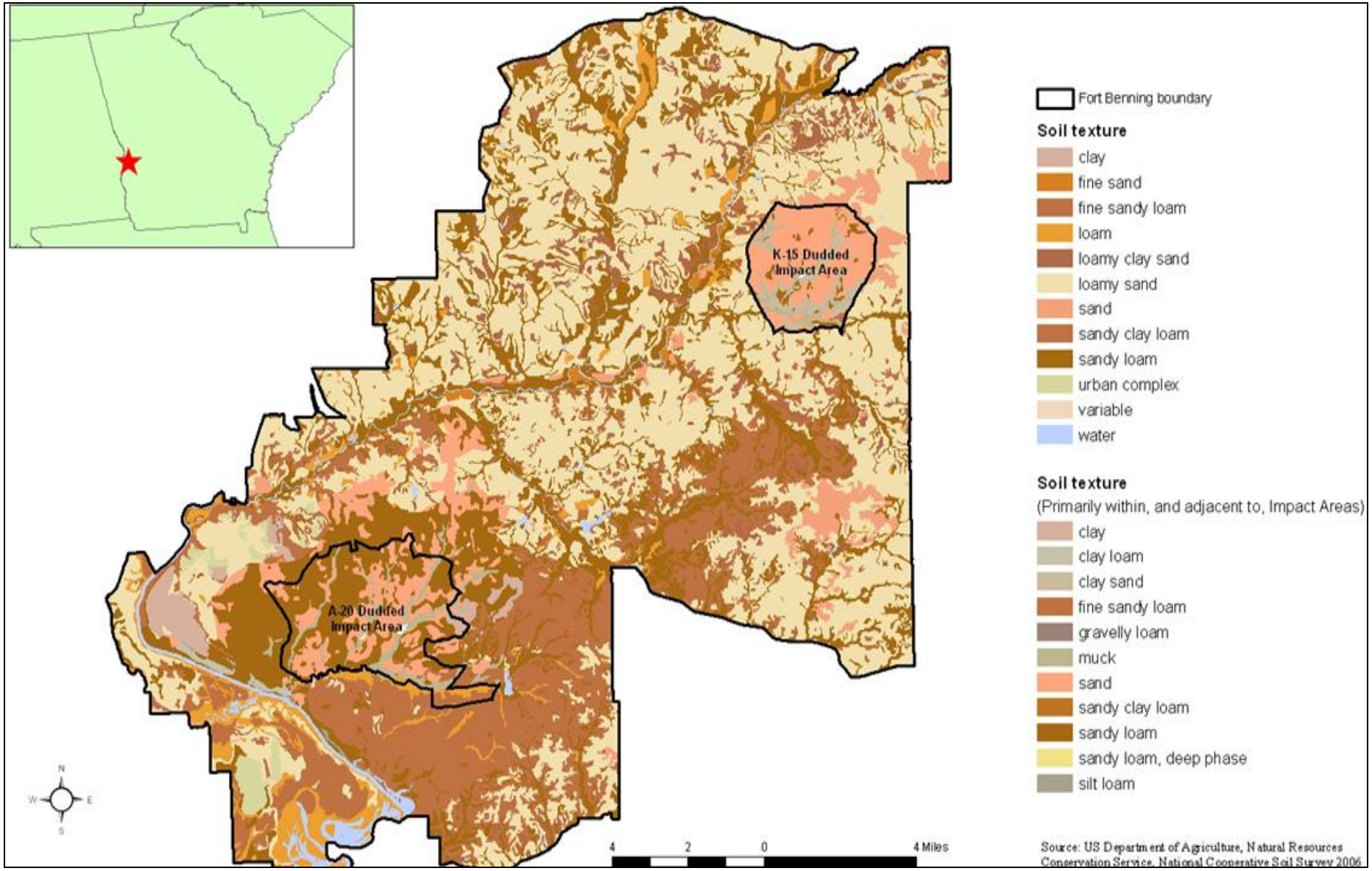


Figure 4.12-1 Soil Texture Map for Fort Benning

Table 4.12-2: Soil Series Descriptions

Soil Series	General Characteristics
Ailey	The Ailey series consists of soils that are deep or very deep to a dense layer. These well drained, slowly permeable soils formed in sandy and loamy marine sediments on uplands, mostly in the upper Coastal Plain. Slopes are 0 to 25 percent. K = 0.15
Riverview	The Riverview series consists of very deep, well drained, moderately permeable soils that formed in loamy alluvium on flood plains. Slopes range from 0 to 5 percent. Near the type location, the average annual temperature is about 66 degrees F and the average annual precipitation is about 58 inches. K = 0.32
Lakeland	The Lakeland series consists of very deep, excessively drained, rapid to very rapidly permeable soils on uplands. They formed in thick beds of eolian or marine sands. Near the type location, the mean annual temperature is about 67 degrees, and the mean annual precipitation is about 52 inches. Slopes are dominantly from 0 to 12 percent but can range to 85 percent in dissected areas. K = 0.10
Chewacla	The Chewacla series consists of very deep, moderately permeable, somewhat poorly drained soils on flood plains. They formed in recent alluvium washed largely from soils formed in residuum from schist, gneiss, granite, phyllite, and other metamorphic and igneous rocks. Slopes range from 0 to 2 percent. Mean annual precipitation is about 48 inches, and mean annual temperature is about 59 degrees near the type location. K =.28
Nankin	The Nankin series consists of very deep, well drained, moderately slowly permeable soils on uplands of the Coastal Plain. They formed in stratified loamy and clayey marine sediments. Slopes range from 0 to 60 percent. K = 0.32
Norfolk	The Norfolk series consists of very deep, well drained, moderately permeable soil on uplands or marine terraces. They formed in marine deposits or fluviomarine deposits. Slopes range from 0 to 10 percent. K = 0.17
Orangeburg	The Orangeburg series consists of very deep, well drained, moderately permeable soils that formed in loamy and clayey sediments of the Coastal Plain. Slopes range from 0 to 25 percent. K = 0.10
Troup	This very deep, somewhat excessively drained soil is on uplands. The subsoil is loamy and extends to a depth greater than 5 ft. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil. Available water capacity is low. K = 0.10
Vaucluse	This very deep, well drained soil is on uplands. The subsoil is loamy and extends to a depth greater than 40 inches. Dense and brittle properties are below a depth of 15 to 35 inches. Permeability is slow and available water capacity is low. K = 0.15
Wagram	The Wagram series consists of very deep, well drained, moderately permeable soil on uplands or marine terraces. They formed in marine deposits or fluviomarine deposits. Slopes range from 0 to 15 percent. K = 0.15

Source: USDA 2006a.

Note: Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Based on the available soil survey data and considering an individual soils series category for its K factor only, most of Fort Benning's soils are identified as low to moderately erodible. However, the actual degree of erodibility that soils exhibit is determined by other physical factors such as drainage, permeability, texture, structure, and percent slope (Fort Benning 2001). The rate of erodibility is based on the amount of vegetative cover, climate, precipitation, proximity to waterbodies, and land use. At Fort Benning, disruptive land uses (i.e., training exercises) are a primary cause of accelerated erosion, which is

evident throughout the Installation. Disruptive activities accelerate the natural erosion process by exposing these erodible soils to precipitation and surface runoff.

Prime Farmland. Prime farmland soils are protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The land must also be available for these uses (cropland, pasture land, forestland, or other land, but not water on urban built-up land). Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods (USDA 2006b). Prime farmland does not include land already in or committed to urban development or water storage; however, land utilized or designated for commercial, industrial, or residential purposes is, therefore, categorically excluded from consideration. While there are soils within Fort Benning that can be classified as Prime Farmland soils, no soils on Fort Benning are used for agricultural purposes. As a result, no area within the Installation is regarded as prime farmland; therefore it will not be discussed further.

4.12.2 Environmental Consequences

Impacts would be considered significant if ground disturbance or other activities would violate applicable federal or state laws and regulations, such as the Georgia Erosion and Sedimentation Act, and results in the potential for Notices of Violation (NOVs) for the failure to receive applicable state permits, such as a NPDES construction/operation permit under the Erosion and Sedimentation Act, prior to initiating the Proposed Action under Alternative A or B.

4.12.2.1 No Action Alternative

Geologic and Topographic Conditions. Under the No Action Alternative, on-going training operations as well as planned new construction and demolition would continue under the Installation's current mission. Fort Benning's environmental stewardship efforts seek to ensure that natural resource conservation measures and military activities on Fort Benning mission land and cantonment areas are integrated and are consistent with federal stewardship requirements (Fort Benning 2001). Fort Benning has begun to integrate its INRMP with its Strategic Environmental Research and Development Program (SERDP) and to Strategic Ecosystem Management Plan (SEMP) to better monitor the ecosystem and respond to environmental issues, concerns, and formal requirements emerging from all DoD services (USACE 2002b). Another important program being implemented at Fort Benning is the ITAM Program, which can be used to monitor land composition trends and mitigate adverse impacts of the military mission on long-term training land viability (Fort Benning 2001). Programs and initiatives such as these, which may commence in the absence of the proposed Fort Benning Transformation, may reduce negative impacts to geologic and topographic conditions. As a result, no significant impacts to geologic or topographic conditions would be expected under the No Action Alternative.

Soils. The threshold level of significance for soils is any ground disturbance or other activities that would violate a federal or state law or regulation, or violate the terms and conditions of a permit issued under a federal or state law or regulation. Impacts to soils would be considered significant if ground disturbance or other activities would violate applicable federal or state laws and regulations, such as the Georgia Erosion and Sedimentation Control Act (ESCA), and the potential for NOV for the failure to receive applicable state permits, such as a National Pollutant Discharge Elimination System (NPDES) construction permit under the ESCA, prior to initiating a Proposed Action.

Under the No Action Alternative, implementation of the FY09 through FY13 projects and activities presented in the BRAC/Transformation actions (See Chapter 3; Table 3.2-4) would proceed with on-going project-specific review through Fort Benning's Form 144R process. New construction and demolition under the approved BRAC/Transformation actions would occur and, as a result, impacts to soils resulting from these activities would occur. The Installation would continue to conduct training exercises utilizing troops and mechanized vehicles. The types of training and the unit requirements would continue to adversely impact the highly erodible soils found at Fort Benning. Impacts to soils resulting from training would be similar to those discussed under the action alternatives; however, these impacts would only occur on the training ranges under current operation. Impacts to soil that would occur as a direct result of the removal of or damage to vegetation, digging activities, ground disturbance from vehicles, and munitions detonation include compaction, disturbance, and soil erosion. The use of tracked vehicles such as the M1A1 Main Battle Tank and the Bradley Fighting Vehicle (BFV) would disturb soils, which would result in soil erosion and stream sedimentation. These impacts, however, are localized in light maneuver areas as tank and BFV travel is restricted to existing roads and trails leading to the range and designated areas within the ranges. Impacts to soils also occur as areas are cleared and/or disturbed for bivouac sites, landing strips and pads for fix-winged aircraft and helicopters, and drop zones for airborne training, which also increases the potential for soil erosion. Training vehicles also have the potential to leak or spill petroleum, oils, and lubricants (POL) onto the soils, resulting in potential soil contamination concerns. These vehicles, however, are required to have drip pans underneath when parked to minimize the potential for contamination from POL spills. Military units are also required to utilize secondary containment for the storage of hazardous materials/wastes and during refueling operations. These and other requirements of spill prevention, control, and countermeasure (SPCC) would continue to be followed. In addition, routine maintenance of the vehicles would help to identify and repair any conditions that might cause POL leaks. The US Army Corps of Engineers also implements erosion control plans on Ft. Benning, and a spill response protocol has been established Installation-wide and personnel on the ranges and in the training areas should have adequate spill response supplies on hand.

The Installation would be responsible for the overall operation maintenance of infrastructure, primary roads, tank trails, ranges, and training facilities proposed under this alternative. The Installation would ensure that all laws and regulations concerning environmental and natural resources protection are addressed, that site-appropriate Best Management Practices (BMPs) related to the control of soil erosion and stream protection are used, and that all required protection, conservation, or mitigation actions

associated with natural resources are incorporated into their activities. In accordance with federal and state regulations, all necessary permits would be obtained for storm water, including NPDES permits (GAR 1000001, 1000002, 100003) which specifically address construction activities (please refer to mitigations in Section 4.12.3 and 4.11.3 for water resource mitigation). The Range Division is responsible for maintaining access roads, configuring ranges and training areas, and maintaining training areas in usable condition. Range operation and maintenance projects are identified and prioritized by the Range Division. These projects are identified by the Range Division's Range Maintenance Coordinator through use of Department of the Army Form 4283 (Facilities Engineering Work Request). The Range Division manages, supervises, and executes the required work. The use of erosion and sedimentation control BMPs for Fort Benning mission lands are a required part of Range Maintenance's day-to-day operations.

Maintenance activities within ranges and training areas also would continue, resulting in the same level of ground disturbance and the same potential for POL spills from the maintenance vehicles themselves. During range safety and maintenance inspections, personnel would continue to check for areas of erosion, spill, and other environmental concerns and take appropriate actions. Implementation of applicable federal and state laws and regulations, such as erosion control BMPs and spill control measures, would repair or minimize potential effects to soils as a result of this alternative, resulting in temporary, minor potential effects only. However, despite the current maintenance schedule that takes place within the training ranges, impacts to soils are unavoidable based on the nature of the training exercises, and evidence of severe erosion has occurred in some areas, such as the areas currently used for heavy maneuver training.

The Installation currently uses BMPs to control soil erosion and for stream protection, and attempts to minimize impacts associated with training activities through the management and maintenance of the training ranges. BMPs must be properly designed and implemented and range maintenance must fully address damage to soils to avoid impacts from soil erosion. All BMPs utilized within the Installation would be in accordance with the Manual for Erosion and Sediment Control in Georgia. While there could be impacts to the highly erodible soils found at Fort Benning as a result of the day-to-day training operations associated with ongoing and future use of the Installation's training ranges, if all the proper procedures are followed by the USACE and Range Division, required permits are obtained, and all the proper BMPs and maintenance activities occur to help off-set these impacts, substantial impacts to soils would not occur. If, however, Range Division is unable to keep up with the demands of managing and maintaining the active training ranges, BMPs are not properly implemented, and/or the ranges are not properly designed, significant impacts to soils could occur.

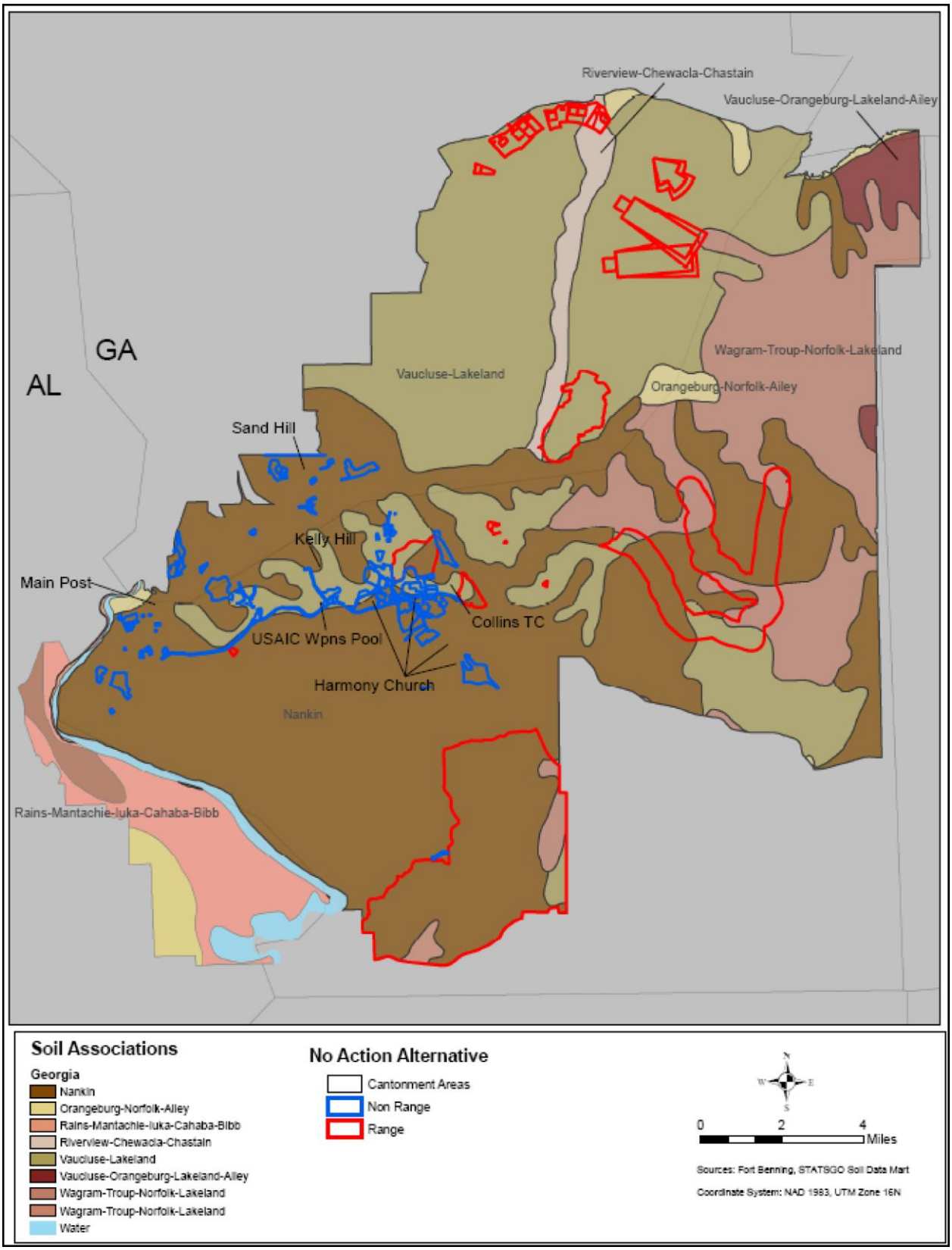


Figure 4.12-2: Impacted Soils: No Action Alternative

4.12.2.2 Alternative A (preferred alternative)

Geologic and Topographic Conditions. No substantial impacts to geologic or topographic conditions would be expected under Alternative A. Prior to the construction of buildings and other facilities proposed under this alternative, minor leveling and grading would be required to prepare each specific site for building. Although training operations should have little impact to geology, topography will be impacted as activities associated with range management (i.e., regrading and leveling disturbed areas) occur over time. However, these impacts would not be considered significant, as no considerable alterations of the general geologic or topographic character of the site would occur, and all laws and regulations concerning environmental and natural resources protection would be addressed.

Soils. Under Alternative A, the proposed construction of storage, maintenance, barracks, commercial services, classrooms and training facilities, dining, dental clinic, recreation facilities and expansion of the water treatment plant, would occur within three cantonment areas: Main Post, Sand Hill, and Harmony Church. The proposed improvements/upgrades to existing ranges and maneuver areas and proposed new ranges have been sited to align with the Installation's existing training assets. Over the entire Installation, cantonment-related projects proposed under Alternative A would include 972 acres of new facilities, including the renovation of existing facilities and infrastructure. Additionally, the projects would involve the construction of and modifications to ranges and training areas. Table 4.12-3 below provides the soil associations and their respective erodibility factors located within each of the cantonment areas and range areas that would be affected by Alternative A.

The physical impacts to soils that would occur as a result of site preparation would include soil compaction, and disturbed and modified soil layers. Soil productivity (i.e., the capacity of the soil to produce vegetative biomass) would also decline in disturbed areas and be completely eliminated for those areas within the footprint of paved or other hardened areas and new structures. Impacts to soils from construction and/or demolition activities occurring in areas that are currently or previously developed would be minimal, given the fact that these soils have been previously disturbed or modified and in some areas are already covered with structures, concrete, or other surfaces.

After these initial physical impacts occur, the rate of soil erosion could differ between areas within the Installation, based on differences in soil erodibility (K) between the different soil associations. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have a moderate K value, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are the most erodible of all soils. They are easily detached; tend to

Table 4.12-3: Potential Soil Association Impacts (Ranges North of U.S. Highway 27/280)– Alternative A

Installation Areas	Total Potentially Affected Area (Acres)	Affected Soil Associations	Erodibility (K)* Factor
Cantonment Area			
Harmony Church	284	Nankin	0.32
		Vaucluse-Lakeland	0.10
Main post	278	Nankin	0.32
		Vaucluse-Lakeland	0.10
		Orangeburg-Norfolk-Ailey	0.10 – 0.17
Sand Hill	410	Nankin	0.32
Cantonment Subtotal	**972**		
Ranges			
Northern	4,227	Vaucluse-Lakeland	0.10
		Riverview-Chewacla-Chastain	0.28 – 0.32
		Orangeburg-Norfolk-Ailey	0.10 - 0.17
		Wagram-Troup-Norfolk-Lakeland	0.10 - 0.15
		Nankin	0.32
Southern	4,262	Vaucluse-Orangeburg-Lakeland-Ailey	0.10 - 0.17
		Vaucluse-Lakeland	0.10
		Nankin	0.32
Range Subtotals	***8,489***		
TOTAL	**9,460**		

crust, and produce high rates of runoff. Values of K for these soils tend to be greater than 0.4 (USDA 2003). As presented, the Nankin Association has the largest K factor at 0.32, and thus is the soil with the most potential to be eroded at the Installation. The Riverview-Chewacla-Chastain association has a K factor of 0.28 to 0.32, and the remaining associations found within the Installation have K factors between 0.10 and 0.24. These K factors, however, represent the soils in their natural condition. They do not indicate how past management or misuse of a soil increases a soil's erodibility. In those areas where the subsoil is exposed, the organic matter has been depleted, and/or the soil's structure destroyed or soil compaction has reduced permeability; the K factor would be increased regardless of soil type (USDA 2003). Other factors affecting erodibility include soil slopes, total exposure time, and slope length. Table 4.11-4 below provides a general percentage of the amount of area of the proposed project areas covered by a specific soil association.

Activities associated with the construction of new facilities, required utility corridors, and for the line-of site clearing for the training ranges proposed under Alternative A would be conducted in several phases. During the initial phase, either the site would be cleared of vegetation or existing structures would be removed. During this phase, soils on the site could be exposed to the elements and highly susceptible to erosion wind and stormwater runoff. While efforts would be subsequently implemented under the NDPES to reduce the potential for erosion, such as the application of erosion control blankets and matting, any amount of time that soils are left exposed would increase the amount and rate of erosion.

These impacts would be greater on the Nankin soils and the Riverview-Chewacla-Chastain than on the other soil associations found within the Installation due to its higher erodibility factor.

The construction and repair of new roads under this alternative would result in an additional soil disturbance. Soil productivity within the footprints of the newly constructed roads would be lost and there would be increased runoff, which in turn could increase the potential for erosion. Travel to and within ranges and training areas, especially as vehicles and equipment exit the training areas and ranges and access the travel routes, would result in vehicles potentially disturbing soil on the side of paved or unpaved roads, and equipment disturbing soils in ranges and training areas resulting in exposed disturbed soils and could increase the potential for erosion. Impacts to soils from the proposed construction of roads and buildings and necessary demolition activities would be minimized by the mitigation measures summarized in Section 4.12.3. Construction and demolition activities may result in the migration of airborne or waterborne soil particles and POLs onto adjacent lands and streams, which could contribute to sedimentation of off-site areas. For POLs, Fort Benning would require use of fueling and maintenance practices as well as spill counter measures to prevent contamination of soil. During the construction process, any construction exits would use existing access roadways to the landings, or the established maintenance/motor pool area, which would result in less earth moving and vegetative removal.

Construction of facilities involving the use and storage of hazardous materials would be designed to meet the SPCC requirements per AR 200-1 and 40 CFR 112, as well as state and federal requirements as applicable. These facilities include, but are not limited to, wash racks, underground storage tanks (USTs), aboveground storage tanks (ASTs), oil/water separators and dining facilities where grease rendering bins are used, maintenance facilities, loading/unloading operations areas, hazardous material and POL storage areas (above/underground facilities), and generators. Design requirements of these facilities could include, among others: secondary containment and/or diversion structures and spill supplies and equipment to mitigate spills and/or releases. These measures would prevent and/or minimize soil contamination from possible discharge of pollutants into the environment. As part of this alternative, the Installation would also be required to develop a storm water pollution prevention plan (SWP3) and meet municipal separate storm water sewer system (MS4) requirements to minimize impacts to water quality during the operation of these facilities by addressing issues related to both point and non-point source pollution.

Prior to construction, all required permits would be obtained and followed; an appropriate Erosion, Sedimentation, and Pollution Control Plan (ESPCP) would be appropriate site-specific BMPs and mitigation measures would be implemented. As part of the required NPDES permits, an ESPCP for each specific construction area would also be developed describing appropriate site-specific BMPs that would be used to minimize impacts from increased runoff and soil erosion during site construction. Site-specific BMPs would be developed based on proper design, run-off calculation, slope factors, soil type (determined by the Soil Surveys for Chattahoochee, Marion, and Muscogee counties and verified by on-site testing), topography, construction activities involved, and proximity to water bodies (see Section 4.12.3 for mitigation measures). Any construction occurring within 25 ft of a stream would be required to

consult with the state and secure an SBV (see 4.11.3 for water resources mitigations). In addition, all BMPs utilized within the Installation would be in accordance with the Manual for Erosion and Sediment Control in Georgia. As a result, the overall impacts to soils at Fort Benning would be considered not significant. If, however, construction starts before all required permits are received, a non-site specific or improper ESPCP is prepared that does not provide for the proper BMPs, or are improperly implemented, and the post-construction sites are not properly maintained, the potential for significant impacts to the soils from erosion would be great.

Approximately 8,489 acres of soils within the proposed training ranges would be impacted as a result of range development and ongoing operation and use. The soils within these new ranges would be impacted by the initial site preparation of the proposed range development, mechanized vehicle maneuvers, and the overall increases in the number of tenant units stationed at Fort Benning (and, therefore, increased use of ranges). Future training operations, coupled with the current training schedule, would result in significant impacts to the soils within these ranges. The actual extent of impacts would vary depending on the degree to which sensitive areas experienced repeated use (such as from training schools) versus episodic, intermittent use, which would allow for some limited recovery of soils between disturbances. Impacts to soils would occur as a result of clearing trees and other vegetation for line of sight, digging activities, ground disturbance from vehicles, and munitions detonation. Impacts to soils include compaction, disturbance, and movement that may result in soil erosion and eventually sedimentation of the Installation's many creeks. The use of vehicles such as the M1A1 tanks and BFVs in heavy maneuver areas can produce significant direct and indirect impacts to soils and water quality (See Section 4.11). These impacts are related to soil disturbance which leaves the soil highly disrupted and susceptible to the erosive forces of raindrops, wind, and runoff, and ultimately to stream sedimentation. Table 4.12-4 provides the coverage of the soil associations of the total area of the proposed ranges, and their respective K factor. As these soils become disturbed, the soil erodibility of each of these specific soil associations would likely increase due to compaction and exposure.

Table 4.12-4: Coverage of Soil Associations per Total Area of Alternative A Actions

Soil Name	Non-Range Transformation	Range Transformation
Orangeburg-Norfolk-Ailey	1%	3%
Vaucluse-Lakeland	21%	54%
Nankin	59%	43%
Wagram-Troup-Norfolk-Lakeland	18%	Null
Vaucluse-Orangeburg-Lakeland-Ailey	Null	Null
Riverview-Chewacla-Chastain	Null	Null

These direct impacts, however, would be localized as most tank and BFV travel is restricted to existing roads and trails leading to the range and to existing lanes and designated areas within the range. Impacts related to vehicular use within these areas would always be greater in the steeper portions (slope greater than 10 percent) of the Installation and in areas previously disturbed. Areas disturbed by vehicle maneuvers on hillsides would erode much faster than on flat ground, as surface run-off would have greater erosive energy as it moves downhill. Impacts to soils would also occur from ongoing training uses

as areas are cleared and/or disturbed for bivouac sites, landing strips, and pads for fix-winged aircraft and helicopters, and drop zones for airborne training, which also increases the potential for soil erosion. As the soils within the training ranges are continually disturbed, compacted, and eroded, the overall productivity of the soil decreases, inhibiting plant growth (see Section 4.13).

Alternative A would result in a short-term increase in construction vehicles and activity and a long-term increase in training and maintenance vehicles operating within the ranges in training areas. Existing management measures to address the potential to leak or spill POLs onto the soils as described for the No Action Alternative would apply to these new training operations. During range safety and maintenance inspections, personnel would continue to check for areas of erosion, spill, and other environmental concerns and take appropriate actions. Implementation of applicable federal and state laws and regulations and already-established Installation policies and guidelines, such as erosion control BMPs and spill control measures, would repair or minimize potential effects to soils as a result of this alternative, resulting in no significant impacts and a minimal increased potential for contamination concerns. Also, as with the No Action Alternative, the Installation would continue to be responsible for obtaining all the necessary permits for storm water and erosion control for the development and long-term management of the new training ranges. The Range Division would continue to be responsible for maintaining access roads, configuring ranges and training areas, and maintaining training areas in usable condition. While there would be impacts to the highly erodible soils found at Fort Benning as a result of the proposed training operations that would occur as part of Alternative A, all required permits would be obtained and implemented, and all appropriate site-specific BMPs and mitigation measures would be implemented to minimize these impacts (see Section 4.12.3 for mitigation measures). As a result, impacts to soils from on-going and future use of the Installation's training ranges would not be significant.

4.12.2.3 Alternative B

Under Alternative B, the proposed development of barracks (PN72322, PN72324, and PN69745), troop store (PN71065), classrooms, and training facilities (PN69150, PN72456, PN72457 and PN65250), dining (PN69151, PN70026 and PN70027), health facilities (PN71620 and PN70235) recreation facilities (PN65246 and PN65248) and expansion of the water treatment plant (PN71473), Shop 1 Maintenance Facility (PN65322), would remain the same as under Alternative A. As detailed in Section 3.4.2., Alternative B differs from Alternative A primarily by additional range construction and use, as well as in the areas where heavy maneuver training and driver training would occur. In Alternative B, the MPTR would be established north of Hastings Range, rather than upgrading Hastings Range to an MPTR as in Alternative A for an additional soils impact of 984 acres for Alternative B versus Alternative A for the MPTR project. Other differences between Alternative B and Alternative A are that the major changes that have occurred in Alternative A to reduce impacts for the Vehicle Recovery Course (PN72017) do not occur in Alternative B. Major changes that have reduced impacts in Alternative A also do not occur in the Southern Training Area Infrastructure (PN69743). Modifications that have occurred in the Modified Record Fire (MRF 7) (PN65049) and Firing Range 2 (Z2) (PN65036) also do not occur in Alternative B. The Shop 1 Maintenance Facility located on 10 acres in the Harmony Church Cantonment Area, which is

proposed under Alternative A, would not be present under Alternative B. Also under Alternative B, 19D/K One Station Unit Training would take place in TA-Q1, Q2, Q3, and Q5. Alternative B would also have two additional Multi-Purpose Machine Gun Ranges (MPMG 1 and MPMG 2) (PN68733 and 65070) and an Automated Combat Pistol Qualification Course (PN65079). Alternative B would also include the Unit Maintenance Facilities (PN69406).

Geologic and Topographic Conditions. No substantial impacts to geologic or topographic conditions would be expected under Alternative B. Prior to the construction of buildings and other facilities proposed under this alternative, minor leveling and grading would be required to prepare each specific site for building. Training operations would have little, if any, impacts to geology. Slight impacts to topography could occur as activities associated with range management (i.e., regrading and leveling disturbed areas) could occur over time. However, these impacts would not be considered significant, as no considerable alterations of the general geologic or topographic character of the site would occur, and all laws and regulations concerning environmental and natural resources protection would be addressed.

Soils. As with Alternative A, impacts to soils from the proposed construction activities would be minimized by appropriate site-specific BMPs and mitigation measures detailed within each site-specific ESPCP and in accordance with the Manual for Erosion and Sediment Control in Georgia (see Section 4.12.3 for mitigation measures). The physical impacts to soils resulting from the preparation and future use of training ranges proposed under this alternative would be similar to those described under Alternative A. Table 4.12-5 provides a general percentage of the amount of area of the proposed project areas covered by a specific soil association.

Table 4.12-5: Coverage of Soil Associations per Total Area of Alternative B Actions

Soil Name	Non-Range Transformation	Range Transformation
Orangeburg-Norfolk-Ailey	6%	Null
Vaucluse-Lakeland	10%	31%
Nankin	84%	52%
Wagram-Troup-Norfolk-Lakeland	Null	14%
Vaucluse-Orangeburg-Lakeland-Ailey	Null	1%
Riverview-Chewacla-Chastain	Null	2%

As these soils become disturbed, the erodibility of each of these specific soil associations likely would increase. Direct impacts for both alternatives for range maneuvers would be widespread within the training ranges as tracked vehicles travel would not be restricted to existing roads and trails. Impacts related to vehicular use within these areas would always be greater in the steeper portions of the Installation (slopes greater than 10 percent) and in areas previously disturbed. Areas disturbed by vehicle maneuvers on hillsides would erode much faster than on flat ground, as surface run-off would have greater erosive energy as it moves downhill.

Impacts to soils would also occur from ongoing training uses as areas are cleared and/or disturbed for bivouac sites, landing strips, and pads for fix-winged aircraft and helicopters, and drop zones for airborne training, which also increases the potential for soil erosion As the soils within the training ranges are

continually disturbed, compacted, and eroded, the overall productivity of the soil decreases, inhibiting plant growth (see Section 4.12). Under Alternative B, the Northern Maneuver Corridor (soil association Vaucluse-Lakeland with a K factor of 0.10) would continue to support light infantry training, as opposed to heavy under Alternative A, similar to levels that presently occur in this area. The Northern Maneuver Corridor would also support increased infantry training displaced from the proposed Good Hope Maneuver Area.

As with the No Action Alternative and Alternative A, no significant impacts to soils as a result of on-going and future use of the Installation's training ranges would be expected as all required permits would be obtained and implemented and all appropriate site-specific BMPs and mitigation measures would be conducted in accordance with the Manual for Erosion and Sediment Control in Georgia (see Section 4.12.3 for mitigation measures).

The types of impacts to soils from POLs from construction/demolition activities and the use and maintenance of the Installation's training ranges under Alternative B would be similar to those described under Alternative A except for the greater amount of land disturbance associated with Alternative B. All mitigations and protocols to minimize these impacts would be the same as described for Alternative A. Table 4.12-6 presents soils association impacts with Alternative B.

Table 4.12-6: Potential Soils Association Impacts (Ranges North of U.S. Highway 27/280)– Alternative B

Installation Areas	Total Potentially Affected Area (Acres)	Affected Soil Associations	Erodibility (K)* Factor
Cantonment			
Harmony Church	204	Nankin	0.32
		Vaucluse-Lakeland	0.10
Main Post	638	Nankin	0.32
		Vaucluse-Lakeland	0.10
		Orangeburg-Norfolk-Ailey	0.10 – 0.17
Sand Hill	670	Nankin	0.32
Cantonment Subtotals	***1,512***		
Ranges			
Northern	2,174	Vaucluse-Lakeland	0.10
		Riverview-Chewacla-Chastain	0.28 – 0.32
		Orangeburg-Norfolk-Ailey	0.10 - 0.17
		Wagram-Troup-Norfolk-Lakeland	0.10 - 0.15
		Nankin	0.32
Southern	2,333	Vaucluse-Orangeburg-Lakeland-Ailey	0.10 - 0.17
		Vaucluse-Lakeland	0.10
		Nankin	0.32
Range Subtotals	***4,507***		
TOTAL	**6,019**		

As with the No Action Alternative and Alternative A, no significant impacts to soils as a result of on-going and future use of the Installation's training ranges would be expected as all required permits would

be obtained and implemented and all appropriate site-specific BMPs and mitigation measures would be conducted in accordance with the Manual for Erosion and Sediment Control in Georgia (see Section 4.12.3 for mitigation measures).

4.12.3 Mitigation Measures

Potential impacts would be mitigated through implementation of an ESPCP in accordance with the Manual for Erosion and Sediment Control in Georgia. BMPs for the ESPCP could include erosion control matting, channel stabilization, silt fencing, brush barriers, construction exits, temporary and permanent seeding, and application of mulch. Construction vehicles have the potential to leak or spill POL onto the soil, resulting in soil contamination concerns. Contractors will be required to conform to practices to minimize POL spills which could include secondary containment of vehicles and stored POL products and hazardous materials. The following management regimes would help minimize and mitigate impacts to soils resulting from implementation of the Proposed Action:

Facilities involving the use and storage of hazardous materials would be designed to meet the SPCC requirements under AR 200-1. Actions required under the SPCC include:

a. Training vehicles are required to have drips pans underneath when parked to minimize POL spills.

b. Military units are required to utilize secondary containment for the storage of hazardous materials/wastes and during refueling operations.

c. Routine maintenance of the vehicles would help to identify and repair any conditions that might cause POL leaks.

d. A spill response protocol has been established Installation-wide and personnel on the ranges and in the training areas should have adequate spill response supplies on hand.

During range safety and maintenance inspections, personnel would check for areas of erosion, spill, and other environmental concerns and take appropriate actions.

As part of the required NPDES permits, an ESPCP would be developed for each specific construction area with the potential to disturb more than 1 acre of land and would describe appropriate site-specific BMPs that would be used to minimize impacts from increased runoff and soil erosion during site construction. Site-specific BMPs would be developed based on proper design, run-off calculation, slope factors, soil type, topography, construction activities involved, and proximity to water bodies. Examples of BMPs that could be utilized at Fort Benning include, but are not limited to:

- erosion control matting;
- channel stabilization;
- silt fencing;
- brush barriers;
- storm drain outlet protection;
- stone check dams;
- rock filter dams;
- construction exits;
- temporary and permanent seeding; and
- application of mulch.

The application of any or all of these BMPs depends upon precise, specific ground conditions in the areas disturbed by construction. All BMPs utilized within the Installation would be in accordance with the Manual for Erosion and Sediment Control in Georgia.

4.13 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals and the habitats within which they occur. The dominant plant species make up plant communities, which in turn define the vegetation of an area. Habitat is defined as the area or environment where the resources and conditions are present that cause or allow a plant or animal to live there (Hall *et al.* 1997).

Related construction activities for actions identified in this section and the following subsections would be subject to the requirements of all applicable laws, regulations, and permits that may be required for construction. These may include, but not necessarily be limited to, NPDES and MS4 permits, which are described in more detail in Section 4.11 and 4.12.

4.13.1 Affected Environment

The ROI for biological resources is identified within each resource section. Biological resources for this EIS include vegetation, aquatic habitats and wetlands, fish and wildlife, special status species, and Unique Ecological Areas (UEA) potentially affected by demolition, construction, training, or operational activities associated with the Proposed Actions at Fort Benning. Each category is described in detail below.

4.13.1.1 Vegetation

Vegetation includes all terrestrial plant communities. The affected environment for vegetation includes those areas subject to demolition and construction ground disturbance, as well as training areas.

The vegetation of Fort Benning reflects its location astride the "Fall Line," which extends from western Georgia to the Carolinas and divides the Atlantic and Gulf Coastal Plain from the Piedmont Plateau. The Fall Line is a band of transitional habitat, which runs directly through the Fort Benning Region. Vegetation at the Installation includes two broadly defined ecological units or subsections. The northern portion of the Installation is part of the Sand Hills subsection, while the southern portion is part of the Upper Loam Hills subsection. The transitional area between the regional ecological units along the Fall Line is a band of deep, sandy soils and rolling hills (the picture to the right provides an illustration of such habitat). Sandy surface soils and loamy subsoils characterize the Sandhills ecological unit. Longleaf pine (*Pinus palustris*) is a characteristic plant species whose dominance is maintained by frequent fires. Relatively open woodland vegetation is common on upland areas while lowland areas more often support

dense forest. In the absence of fire, the vegetation becomes dominated by oaks and hickories (GDNR 2005).

The Upper Loam Hills cover most of the southwestern area of Fort Benning. Soils in this subsection are heavier in texture with higher water holding capacity and higher organic matter content than soils of the Sand Hills. Characteristic vegetation includes oak-hickory forest, with post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), pignut hickory (*Carya glabra*), mockernut hickory (*Carya tomentosa*), and sand hickory (*Carya pallida)*. These hardwoods become dominant in landscapes without frequent fires. A frequent fire regime favors fire-tolerant species, leading to longleaf pine forests and woodlands (Fort Benning 2001, 2003a).

Fort Benning is located within the Longleaf Pine Ecosystem, which once covered over 90 million acres of the southeastern United States. The upland areas were historically dominated by longleaf pine with a mixture of other pine species within the stands. Oaks and other less fire tolerant species dominated the drains and areas that were not subject to natural wildfires. As a result of changes in agricultural and forestry practices and of land ownership through the past 150 years, the original vegetative cover has been modified to a predominantly coniferous/deciduous mixture (Fort Benning 2001, 2003a).

There are more than 1,275 species of plants on Fort Benning. Vegetated acreage on Fort Benning consists of approximately 16,000 acres of lawn and grassed areas, approximately 4,000 acres of open land and old fields (shrubs and herbaceous plants), and approximately 163,000 acres of woodland (includes ordnance impact areas and excludes approximately 1,000 acres of water bodies). Loblolly (*Pinus taeda*) and longleaf pine are the principal conifers on the reservation and make up approximately 54,000 acres of the woodlands. The remaining 109,000 acres of woodland consist of approximately 55,000 acres of mixed pine and hardwoods and 54,000 acres of hardwood forest (Fort Benning 2001, 2003a).

In 2001, The Nature Conservancy (TNC) created a map of general forest stand types by interpreting 1999 aerial color imagery. Forest stands at Fort Benning were divided into seven categories, as described below.

- **Hardwood**: Dominant overstory is composed of hardwood species, with few to no large pine individuals. Includes the Dry-Mesic Hardwood ecological group (see below).
- **Hardwood/Pine**: Dominated by hardwoods, but mixed pine species also present.
- **Longleaf Pine**: Dominated by longleaf pine, may contain scrub oak and shrubby understory.
- **Longleaf Pine Plantation**: Longleaf pine planted for timber management or ecosystem restoration. Longleaf pine plantations are replacing some areas formerly planted with loblolly and slash pine (*Pinus elliottii*).
- **Mixed Pine/Longleaf Pine**: Dominated by longleaf pine, but contains a representative community of other pine species.
- **Pine/Hardwood**: Dominated by longleaf and other pines, some hardwoods present in the understory and occasional hardwoods present in the canopy.
- **Pine**: Mixed pine species, longleaf pine is not dominant.

Terrestrial and aquatic communities were further divided into 14 ecological groups (Fort Benning 2001, 2003a). Ecological groups delineated in the Integrated Natural Resources Management Plan (INRMP) are derived from Phase I of the Vegetation Characterization Project (Pyne 2001). The ecological groups comprise plant associations that tend to be found in similar environments and are influenced by similar ecological processes. Ecological groups represent potential natural conditions and are characterized in general terms, whereas current local conditions often differ as a function of recent historical land use and disturbance. Eight of the ecological groups are primarily aquatic habitats and are addressed in section 4.11.1.6. The remaining six ecological groups are upland plant communities described below, based on descriptions in the 2001 INRMP and draft revisions in 2002 and 2003. Table 4.13-1 lists the six ecological groups and the estimated acreage of each that occurs plus the acreage of other altered areas at Fort Benning. These acreages reflect the current baseline conditions as of 2008, assuming the implementation of previously approved BRAC/Transformation projects. Figures 4.13-1 and 4.13-2 depict the coverage of the upland ecological groups across the Installation.

Table 4.13-1: Upland Vegetation Acreage (Ecological Groups)

Ecological Group	Existing Acres at Fort Benning
Mesic Hardwood forests	1,136
Dry-mesic hardwood and dry-mesic mixed hardwood / pine forests	15,283
Longleaf pine loamhills	17,367
Longleaf pine sandhills	67,377
Plantations	19,881
Other altered areas	20,603
Successional upland deciduous or mixed forests	10,353
Total	**151,997**

Mesic Hardwood Forests

This is a hardwood community that is not dominated by oak species. Beech (*Fagus grandifolia*), ash (*Fraxinus* spp), sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*), red oak (*Quercus rubra*), white oak, and bitternut hickory (*Carya cordiformis*) are common canopy species. Sub-canopy species include flowering dogwood (*Cornus florida*), American hornbeam (*Carpinus caroliniana*), witch hazel (*Hamamelis virginiana*), and red bay (*Persea borbonia*). Shrubs and ground cover species include titi (*Cyrilla racemiflora*), mountain laurel (*Kalmia latifolia*), fetterbush (*Lyonia lucida),* wild grape (*Vitis* spp.), partridge berry (*Mitchella repens*), wild sarsaparilla (*Smilax pumila),* Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Toxicodendron radicans*). Additionally, several drainage systems on the Installation support mountain laurel, perfoliate bellflower (*Uvularia perfoliata*), American ginseng (*Panax quinquefolium*), and sanicle (snakeroot) (*Sanicula* spp.), species that are more typically associated with northern habitats. Special status plant species in this community include American ginseng and croomia (*Croomia pauciflora*) (see Section 4.13.1.3) (U.S. Army 2001, 2003).

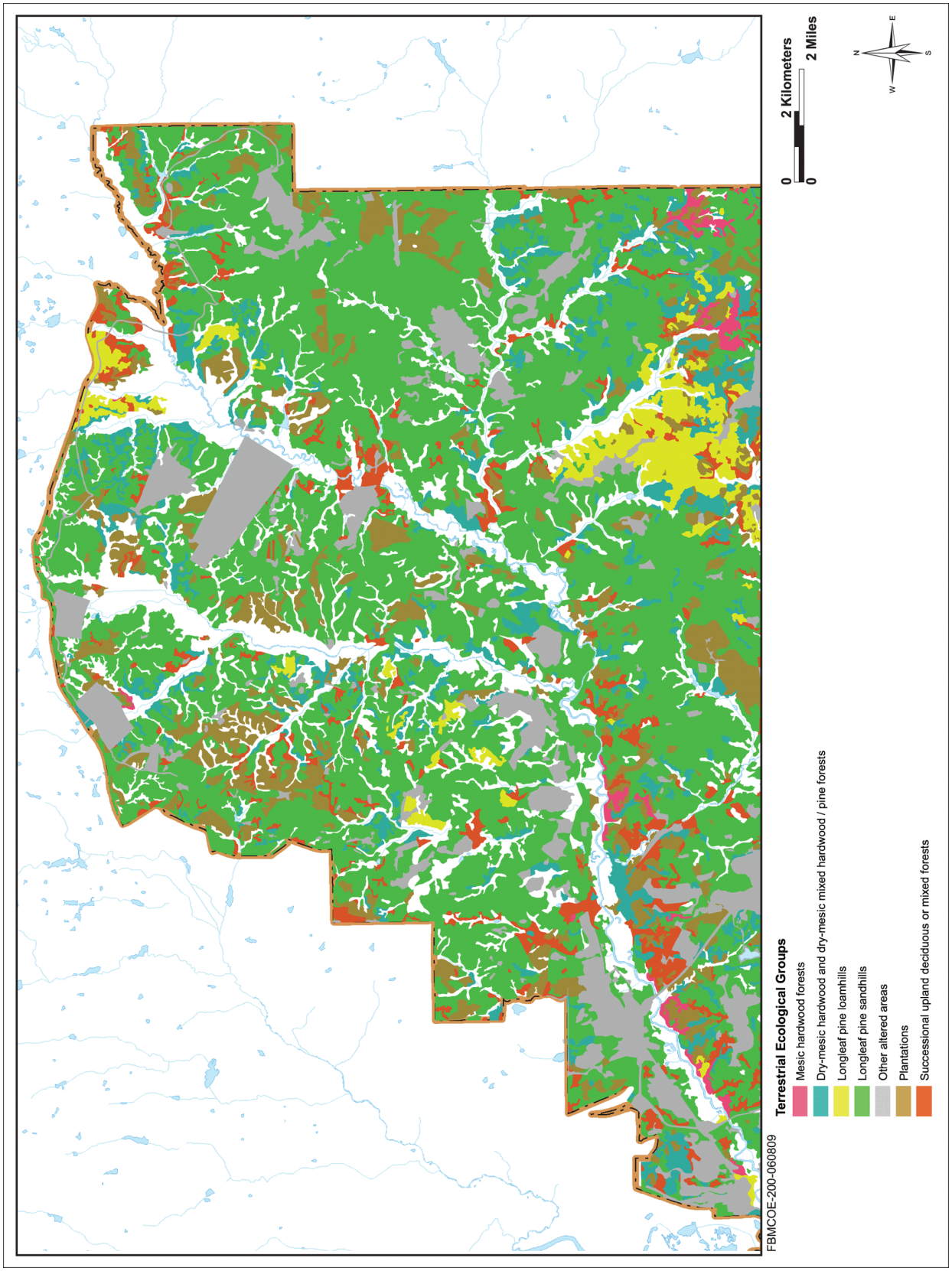


Figure 4.13-1: Upland Ecological Groups – Northern Installation

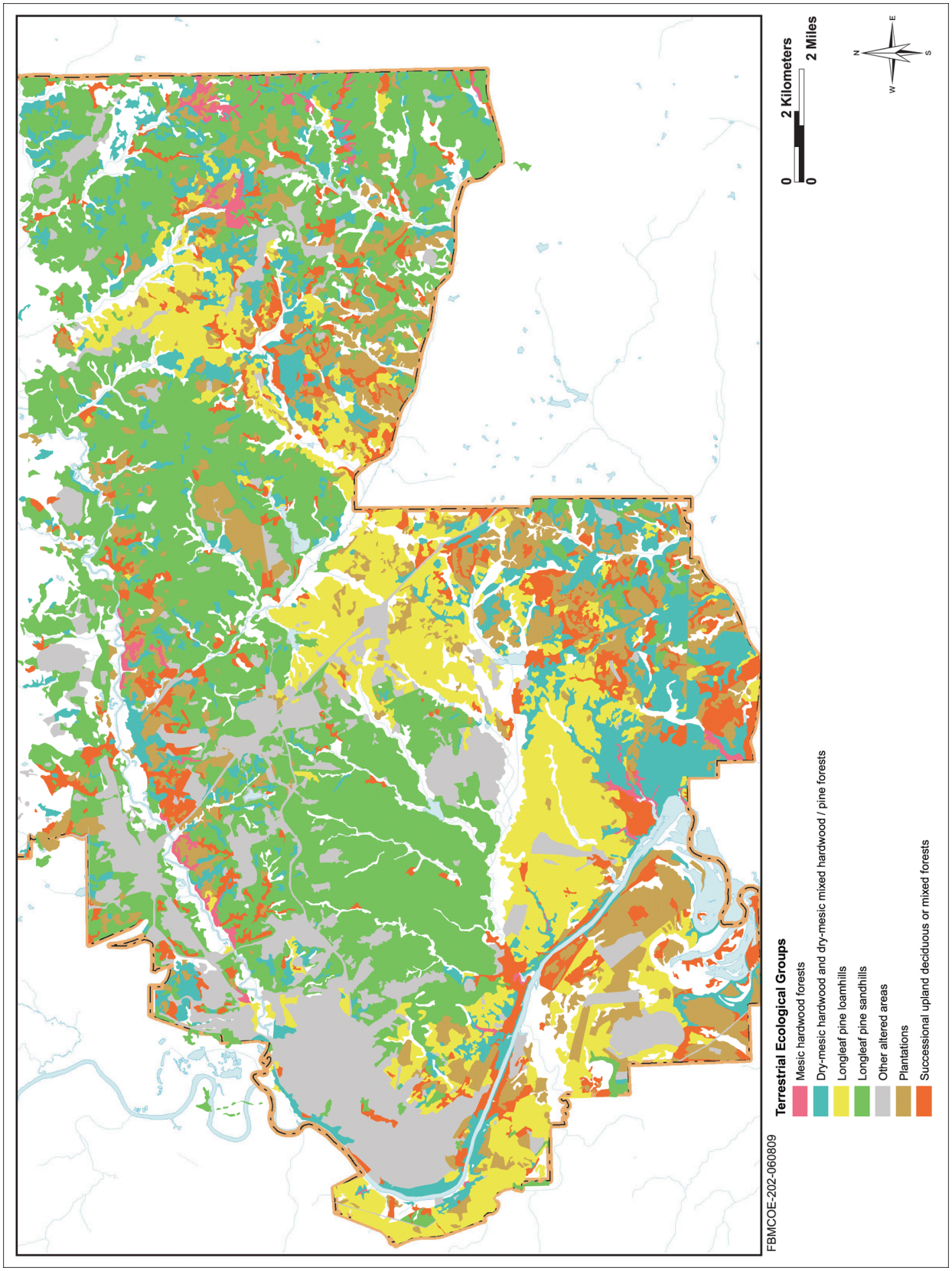


Figure 4.13-2: Upland Ecological Groups – Southern Installation

Mesic hardwood forests are generally found on the Installation in the bottoms of cool, shady ravines. Because of the associated topography and landscape position of these communities, fire return intervals are likely relatively long. Growing season fires or fires that are too intense can damage these sensitive mesic plant communities (U.S. Army 2001, 2003). Mesic hardwood forests are not common at the Installation, but are most prevalent in the southeastern portion, near the Heavy Maneuver Corridor – South.

Dry-mesic Hardwood and Dry-mesic Mixed Hardwood / Pine Forest

These forests are quite variable on the Installation and occur in the ecotone between the dry ridge tops and the mesic bottoms. Common species found in these areas include white oak, red oak, water oak (*Quercus nigra*), sweetgum, loblolly pine, shortleaf pine (*Pinus echinata*), tuliptree (tulip-poplar) (*Liriodendron tulipifera*), American holly (*Ilex opaca*), pignut hickory, southern red oak, and post oak. Sourwood (*Oxydendrum arboreum*), farkleberry/tree sparkleberry (*Vaccinium arboretum*), red maple (*Acer rubrum*), flowering dogwood, chalk maple (*Acer leucoderme*), redbud (*Cercis canadensis*), and American hornbeam are common mid-canopy species. Common shrubs include sassafras (*Sassafras albidum*), deer berry (*Vaccinium* spp.), and littlehip-haw (*Crataegus spathulata*). Woody vines include greenbrier (*Smilax* spp.), rattan vine (*Berchemia scandens*), cross vine (*Bignonia capreolata*), and yellow jessamine (*Gelsemium sempervirens*). Herbaceous species include arrowleaf (ginger) (*Hexastylis arifolia*), partridge berry, and several grasses. Indian olive (*Nestronia umbellula*) is a special status species found within this ecological group (see Section 4.13.1.3).

This forest community appears in a patchy distribution throughout the Installation and is most prevalent in the Good Hope area at the southern edge of the Installation.

Longleaf Pine Loamhills

The stands are often a mix of loblolly, shortleaf, and longleaf pine over loamy soils. Common understory species include post oak, blackjack oak, flowering dogwood, and juvenile pines. Shrubs include deerberry, inkberry/gallberry (*Ilex glabra*), farkleberry, wax myrtle (*Morella cerifera*), and sassafras. Common herbaceous species typically include a variety of native legumes, native grasses, including little bluestem (*Schizachyrium scoparium*), and bracken fern (*Pteridium aquilinum*). More disturbed areas may contain broomsedge (*Andropogon virginicus*) and Japanese honeysuckle (*Lonicera japonica*) (U.S. Army 2001, 2003).

Depending on the mix of pine species in the stand, slope position, and size of the natural fire compartment, natural fire-return intervals are variable. Fire-return intervals for some stands are frequent, in part because of the many ordnance-induced wildfires that occur within or adjacent to these stands.

The Longleaf Pine Loamhills community occurs throughout the Installation, but is more prevalent in the southern portion than in the northern portion. On Fort Benning, sites classified as part of this ecological group may not currently support a longleaf pine forest or woodland. Historical land-use, especially lack of fire until recently, has favored loblolly pine or shortleaf pine dominance. The Longleaf Pine Woodland, a subtype of the Longleaf Pine Loamhills ecological group, is a major target for restoration by Conservation and Land Management staff. Fort Benning's goal is the restoration and maintenance of 90,000 acres of this plant community across the Installation (U.S. Army 2001, 2003).

Longleaf Pine Sandhills

The Longleaf Pine Sandhills are characterized by relatively open stands of longleaf pine, frequently with an understory of scrub oak, on sandy soils. Longleaf pine maintains stronger dominance here than in the loamhills; loblolly and shortleaf pine are less able to compete successfully in the deep sandy and dry soils. Scrub oaks that are a common component of these stands include bluejack (*Quercus incana*), sand post oak (*Quercus margarettiae*), and turkey oak (*Quercus laevis*). Sassafras, farkleberry, and hawthorn (*Crataegus* spp.) are common shrub species. Grasses and legumes are diverse and common in the ground layer.

Despite stronger longleaf pine dominance, the Sandhills stands are generally less dense overall than the Loamhills stands. Because of lower fuel conditions on average as compared with the loamhills, the natural fire return interval is longer in the sandhill. A regular, consistent burning schedule (i.e., always the same season) may reduce the understory plant diversity of the Longleaf Pine Sandhills. On Fort Benning, sites classified as part of this ecological group may not currently support a longleaf pine forest or woodland due to historical land-use practices. Lack of fire, until recently, has often favored loblolly pine or shortleaf pine in these areas.

The Longleaf Pine Sandhills ecological group is the dominant plant community on the Installation, although it transitions to Loamhills in the southern Good Hope area.

Plantations and Other Altered Areas

Plantations and other altered areas represent habitat that had been substantially modified by silviculture, urban development, training exercises, or other human activity. Plantations are present on Fort Benning in stands of various age classes. About 16,000 acres of loblolly and slash pine were planted on Fort Benning from 1962 to 1994. In 1976 and 1977, 60 acres of longleaf pine were planted each year and from 1988 to 1999 a total of about 7,000 acres were planted with longleaf pine. Some of the acreage planted in longleaf in recent years has replaced some earlier loblolly and slash plantations that were damaged by southern pine beetles (*Dendroctonus frontalis*). In recent years, forest management goals have shifted from wood production to ecosystem restoration. Loblolly and slash pine plantations that are damaged by southern pine beetles and littleleaf disease are being replaced with longleaf pine in sites

where historically longleaf would have been the dominant species. Abandoned wildlife openings also are being converted to longleaf pine where appropriate (U.S. Army 2001, 2003).

Other altered areas include shrub and grassy areas that are a result of range construction and maintenance activities. The current shrub alliances are defined poorly and require further study and classification to determine which communities are present. Hawthorn and plum (*Prunus* spp.) dominated areas occur in the downrange areas of several of the major live-fire ranges, located in the northern part of the Installation. Some unused grassy areas are currently scheduled for longleaf pine reforestation where appropriate (U.S. Army 2003).

Plantations and other altered areas are distributed throughout the other ecological groups at the Installation, with particular concentration near rivers and waterways.

Successional Upland Deciduous or Mixed Forests

This ecological group was not included in the 2001 INRMP, but was addressed in 2002 and 2003 revisions, based on Pyne (2001). The community describes previously disturbed or open areas that have been recolonized by woody vegetation. Characteristic species includes broad-leaved deciduous and both broad- and needle-leaved deciduous trees. Examples of these communities include early successional deciduous or mixed vegetation dominated by "opportunistic" hardwoods and loblolly pine. Loblolly pine was formerly extensively planted on the Installation and has proliferated into upland areas during a period of extended fire return interval and general fire suppression on parts of the Installation. Other "opportunistic" hardwoods such as sweetgum, tuliptree, and water oak have increased in abundance and distribution across the lands of Fort Benning.

These "semi-natural" or early successional communities likely occupy sites that would not have been dominated by these fire-intolerant hardwood species under a regime of frequent fire (U.S. Army 2001, 2003). Such sites are dispersed throughout the Installation, particularly near water bodies and along the borders of former plantations.

Trees and other plants are important for many reasons, including shade, erosion control, wildlife habitat, timber products, medicinal products, and realistic training scenarios. The current management of the Installation is focused on restoration. Management practices and recommendations are in place to re-establish fire-climax forests and fire-maintained lowlands. Areas are managed to encourage recovery from previous disturbance due to agriculture and timber harvest. Management plans for federally-listed species, such as Red-cockaded Woodpecker (*Picoides borealis)* (RCW), also guide vegetation management policies. Various controls are in place to protect plant life, but some consumptive use is authorized. For example, hardwoods, underbrush, and grass may be cut and used for camouflage inside RCW clusters, consistent with the RCW Endangered Species Management Plan (ESMP). Thinning of the understory is conducted in some stands. Cutting of trees and live limbs in training areas cannot occur without prior approval of Directorate of Public Works (Conservation Branch) through the NEPA process. Harvest of firewood is allowed by permit from the USACE. USAIC Regulation 210-4 (Range and

Terrain Regulation) and USAIC Regulation 210-5 (Garrison Regulation) address these issues in more detail.

4.13.1.2 Fish and Wildlife

Fort Benning is inhabited by more than 350 species of fish and wildlife, including 154 species of birds, 47 species of mammals, 48 species of reptiles, 25 species of amphibians, 67 species of fish, and 9 species of mussels, as well as numerous insect and other invertebrate species that have not been systematically enumerated (Fort Benning 2001, 2003a). Commonly encountered animals include American alligators, turtles, water snakes, wading birds, migratory waterfowl, American beaver, white-tailed deer (*Odocoileus virginiana*), feral swine (*Sus scrofa*), eastern wild turkey (*Meleagris gallopavo*), eastern gray squirrel (Sciurus carolinensis), raccoon (Procyon lotor), rabbits (*Sylvilagus* spp.), other small mammals, and a wide variety of songbirds. The Seminole bat (*Lasiurus seminolu*), southeastern myotis (*Myotis austroriparius*), and Brazilian free-tailed bat (*Tadarida brasiliensis*) are known to occur at Fort Benning. Herpetofauna found on the Installation includes eastern coachwhip (*Masticophis flagellum flagellum*), eastern diamondback rattlesnake (*Crotalus adamanteus*) Florida pinesnake (*Pituophis melanoleucus mugitus*), southern hognose snake (*Heterodon simus)*, eastern tiger salamander (*Ambystoma tigrinum*), and other species of the Longleaf Pine Ecosystem.

Fort Benning supports a high diversity of native freshwater fishes, including both game and non-game species. Native non-game fishes include many species of shiners, darters, shad, and minnows, as well as the southern brook lamprey (*Ichthyomyzon gagei*) (Fort Benning 2001, 2003a). Fishing occurs throughout the Installation within the Chattahoochee River and several major streams, including Upatoi, Ochillee, Oswichee, Randall, Big Pine Knot, and Uchee, numerous oxbows off the Chattahoochee, Upatoi, and Uchee Creeks, beaver ponds, and 14 man-made ponds. The fish ponds are in fair to poor condition due to infrastructure problems and lack of resources to conduct management. Fishing by boat is feasible in Upatoi and Uchee Creeks, in the Chattahoochee River and its backwaters, and in the fish ponds and larger oxbows. Fishing access on the Installation is open to active duty military, retirees, reservists, and DOD civilians and their guests. The most popular fish species sought by fishermen include: largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear or shellcracker (*Lepomis microlophis*), black crappie (*Pomoxis nigromaculatus*), channel catfish (*Ictalurus punctatus*), white bass (*Morone chrysops*), and hybrid white bass (*Morone chrysops saxatilis)* (Fort Benning 2001, 2003a).

Insect communities, crustaceans, and other invertebrates are not well documented at Fort Benning, but the region is typically rich in invertebrate biodiversity. Common insects in stream systems include larval and adult stages of stoneflies, mayflies, midges, and caddis flies. A wide variety of crayfish, mussels, isopods, snails, and amphipods occur in Georgia habitat, although specific distribution and habitat preferences are not well known (GDNR 2006). Soil insects, beetles, weevils and wood borers, and exotic insects are also common in the forests of Georgia (The Bugwood Group 2006).

Fort Benning lies within the native range of approximately 18 species of native mussels, including four federally listed species. None of the federally listed species has ever been found on Fort Benning (Abbott

2006). Eight native mussels and one introduced clam were found in a 1997 survey of Fort Benning streams that included 10 streams as well as the Chattahoochee River and Victory Pond. Mussels were found in Uchee, Cox, Shell, and Oswichee Creeks and in the Chattahoochee River (Fort Benning 2001, 2003a; Abbott 2006). Freshwater mussel surveys, which were conducted again in 2006 at 27 sites in 11 different streams where road crossings exist or are planned, found only two native species, the eastern elliptio (*Elliptio complanata*), found in Dozier and Cox Creeks, and the little spectaclecase (*Villosa lienosa*), found in Cox Creek (Abbott 2006).

Wildlife has many values including outdoor recreation, aesthetics, environmental monitoring, ensuring proper function of the ecosystem, and providing sources of domestic stock. State and/or federal laws protect most species of wildlife, to varying degrees. Hunting on the Installation is allowed for 10 species of resident game mammals: white-tailed deer, eastern cottontail rabbit (*Sylvilagus floridanus*), swamp rabbit (*Sylvilagus aquaticus*), eastern gray squirrel, eastern fox squirrel (*Sciurus niger*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), Virginia opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). There are two species of resident game birds: northern bobwhite quail (*Colinus virginianus*) and eastern wild turkey. Nineteen species of migratory game birds (at least 16 of which are waterfowl) are present: mourning dove (*Zenaida macroura*), common snipe (*Gallinago gallinago*), American woodcock (*Scolopax minor*), Canada goose (*Branta canadensis*), mallard duck (*Anas platyrhynchos*), wood duck (*Aix sponsa*), ring-necked duck (*Aythya collaris*), gadwall (*Anas strepaera*), American wigeon (*Anas americana*), northern pintail (*Anas acuta*), American black duck (*Anas rubripes*), green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), canvasback (*Aythya valisineria*), redhead (*Aythya americana*), bufflehead (*Bucephala albeola*), hooded merganser (*Lophodytes cucullatus*), northern shoveler (*Anas clypeata*), and lesser scaup (*Aythya affinins*). Additionally, hunting is allowed for three nongame animals: coyote (*Canis latrans*), feral swine , and crows (*Corvus* spp). Feral swine are considered a nuisance species and liberal hunting regulations are in effect. Deer and wild turkey are the most sought after species by hunters. Harvest of game species, such as white-tailed deer, wild turkey, bobwhite quail, and rabbits; and sport fish such as catfish (*Ictalurus* spp.), and largemouth bass (*Microtus salmoides*), is regulated by Installation personnel, Georgia DNR, AL Department of Conservation and Natural Resources, and the USFWS. Federal and state laws regarding hunting and fishing are addressed in USAIC Regulation 200-3 (Hunting and Fishing Regulation). Specific requirements for protection of some species of wildlife on Fort Benning (such as the RCW and gopher tortoise (*Gopherus polyphemus*)) are contained in USAIC Regulation 210-4 (Range and Terrain Regulation) and in Fort Benning's ESMPs. Other recreational opportunities, such as bird watching and hiking, also occur on the Installation and are discussed in more detail in Section 4.2.2.

Migratory Birds. All birds on Fort Benning except pigeons, starlings and English sparrows are protected under the Migratory Bird Treaty Act (MBTA). However, state regulations allow hunting of certain game species. This Act implements various treaties and conventions between the US and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Conservation of migratory birds by federal agencies and their consideration in the NEPA process is also mandated by EO 13186. On

July 31, 2006, a Memorandum of Understanding (MOU) was finalized between the Department of Defense and USFWS identifying measures to enhance migratory bird conservation on U.S. military installations. Consistent with this MOU, Fort Benning manages and conserves migratory bird species through its Integrated Natural Resources Management Plan (INRMP) and considers effects to migratory birds in any Proposed Action via the NEPA process. Fort Benning will continue to follow the applicable MOU provisions, which may involve permitting for some activities, and further consideration of migratory bird management in the INRMP. As of February 2007, the Migratory Bird Permit section of 50 CFR Part 21.15 allows for the incidental "take" of migratory birds during military readiness activities except for those ongoing or proposed activities that may result in a significant adverse effect on a population of a migratory bird species. Military readiness activity includes all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. If a significant adverse effect on a population may result, then the Armed Forces must confer and cooperate with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate such significant adverse activities.

Department of the Army interim guidance dated July 28, 2008 addresses unintentional take of migratory birds for actions other than military readiness activities. This memorandum states that non-military readiness activities resulting in unintentional “take” should be addressed in appropriate NEPA analysis and management practices should be developed to minimize adverse impacts on migratory birds to the greatest extent possible. Some of the construction and other activities related to the MCOE Proposed Action are considered non-military readiness activities.

There are approximately 150 species of birds protected under the MBTA present on the Installation either seasonally or year round. Most of these species are breeding residents or neo-tropical migrants for which the typical breeding season is spring through summer. There are potentially 16 species occurring on Fort Benning considered Species of Concern (SOC) based on Partners in Flight (PIF) and Landbird Population Estimates (LPE). Each of these species has been assigned a PIF score. Under the PIF Assessment Process, scores are assigned to each species based on vulnerability factors. These include: Relative Abundance, Breeding Distribution, Non-breeding Distribution, Threats to Breeding, Threats to Non-breeding Distribution, and Population Trend. A higher PIF score indicates greater need for conservation attention directed towards the SOC within the region. Similarly, SOC with higher PIF priorities receive precedence in guiding conservation efforts. Fort Benning is currently cooperating with federal, state, and private organizations in gathering information on many migratory bird species in this region. Fort Benning personnel are dedicated to making sound ecological management decisions while at the same time providing for the needs of the military to accomplish its mission.

According to the PIF LPE database, populations of the migratory bird SOC’s (Table 4.13-2), with the exception of the RCW, are plentiful within the Bird Conservation Region (BCR) where Fort Benning occurs. Additionally, other breeding habitat exists on and off the Installation that can be used by these species. Fort Benning is situated primarily in the East Gulf Coastal Plain (EGCP) BCR. The EGCP BCR

consists of uplands dominated by pine, originally longleaf and slash in the south and shortleaf mixed with hardwoods in the north. These are fire-maintained systems that give way to loblolly pine and hardwoods in damper areas and bottomland hardwood forest in extensive lowland drainages.

Feral Swine. Feral swine are widespread across the Installation in stream floodplain forests and are considered a pest species for many reasons. A primary concern is the extensive damage that occurs due to their feeding habits and their characteristic "rooting" behavior. Their rooting style of feeding behavior can cause damage to vegetation and soil surface. Feral swine can jeopardize the establishment of ground cover and are destructive to native vegetation, which can result in environmental degradation and sedimentation of streams. Impacts of feral swine include soil disturbance, direct mortality of pine and hardwood trees, competition with native wildlife species, habitat disturbance, and direct mortality of threatened and endangered species. In 1997, three of the seven populations of the federally endangered relict trillium on Fort Benning were fenced to prevent further damage due to feral swine (Fort Benning 2001, 2003a). Feral swine can also uproot and damage cables, wiring, targetry, bivouac sites, and other military assets. Current management for this species on the Installation focuses on controlling the population by establishing liberal hunting regulations such as no bag limit and expanded season lengths. In addition, trapping is conducted at specific locations to minimize damage to military assets and sensitive plants. The focus is to control feral swine in selected areas. These high priority areas include threatened and endangered species habitat and UEAs. The Piedmont Interface UEA (see Section 4.13.1.3) and streambank habitats are particularly susceptible to disturbance due to feral swine.

4.13.1.3 Special-Status Species

Special-status species include species listed as threatened, endangered, or proposed as such by the USFWS or the State of Georgia, and other species of conservation concern (Figures 4.13-3 and 4.13-4 illustrate federal and state special status species found on Fort Benning). The federal Endangered Species Act (ESA) protects federally listed, threatened, and endangered plant and animal species. State listed species are not protected under the federal ESA; however, they are protected on state land under Georgia's Wildflower Preservation Act and Georgia's Endangered Wildlife Act. Installations cooperate with state authorities in efforts to conserve these species. Other species of conservation concern include state species of special concern, rare species, unusual species, or a watch-list species. These species are not protected by the ESA; however, they could be considered for listing in the future and are afforded special management attention in Fort Benning's INRMP.

The focus of the analysis in this document is on the federally and state listed or candidate threatened and endangered species, per Army NEPA regulation (32 CFR 651). The area potentially affected by the Proposed Action is confined to the Georgia portion of Fort Benning; therefore, the analysis of state-listed species does not include species listed by Alabama. Federally listed species in Alabama are addressed. Other species of conservation concern are addressed, but are not analyzed to the same level of detail as the species listed by USFWS or State of Georgia as threatened or endangered.

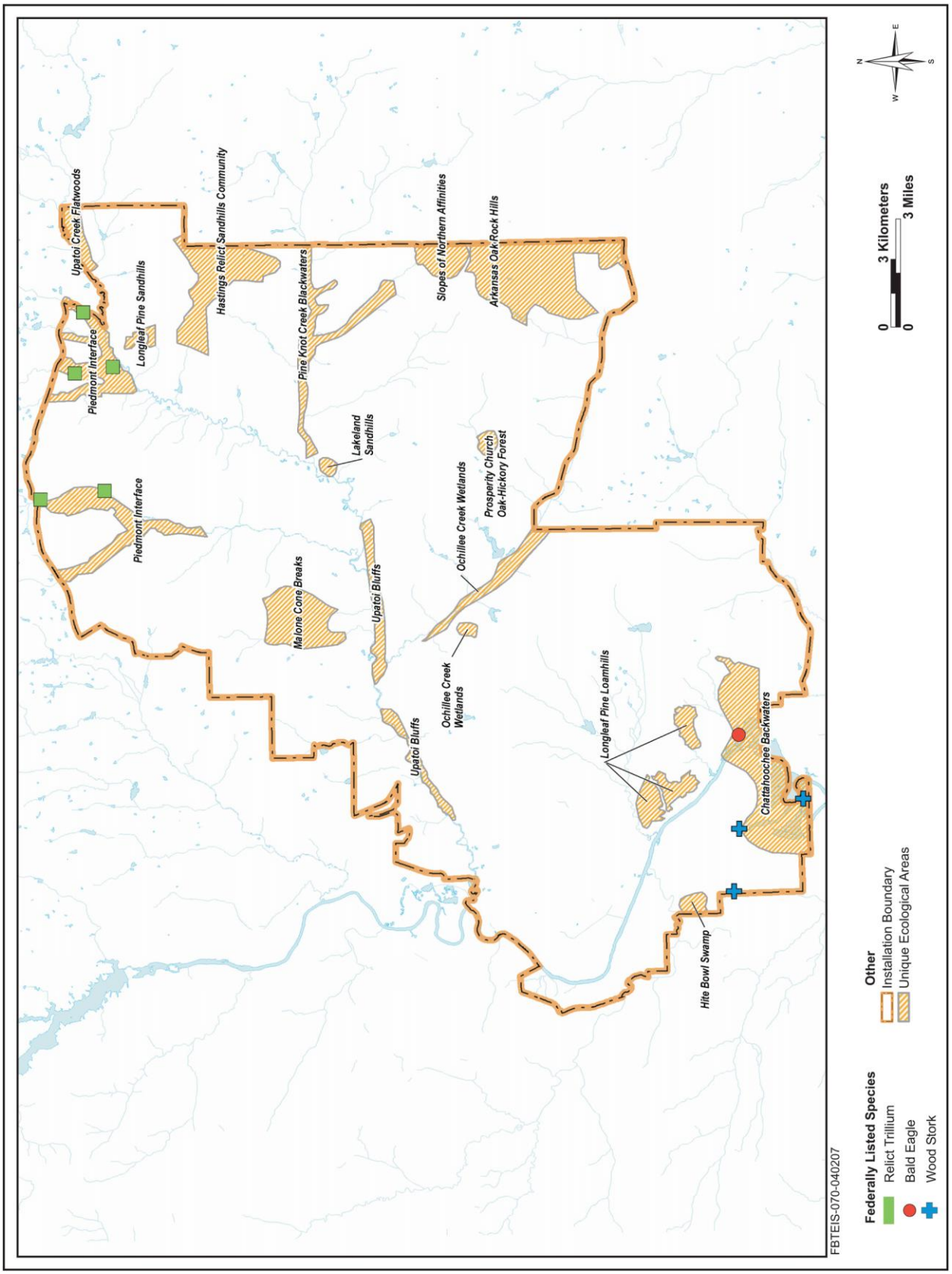


Figure 4.13-3: Known Occurrence of Federally-Listed Species and Unique Ecological Areas

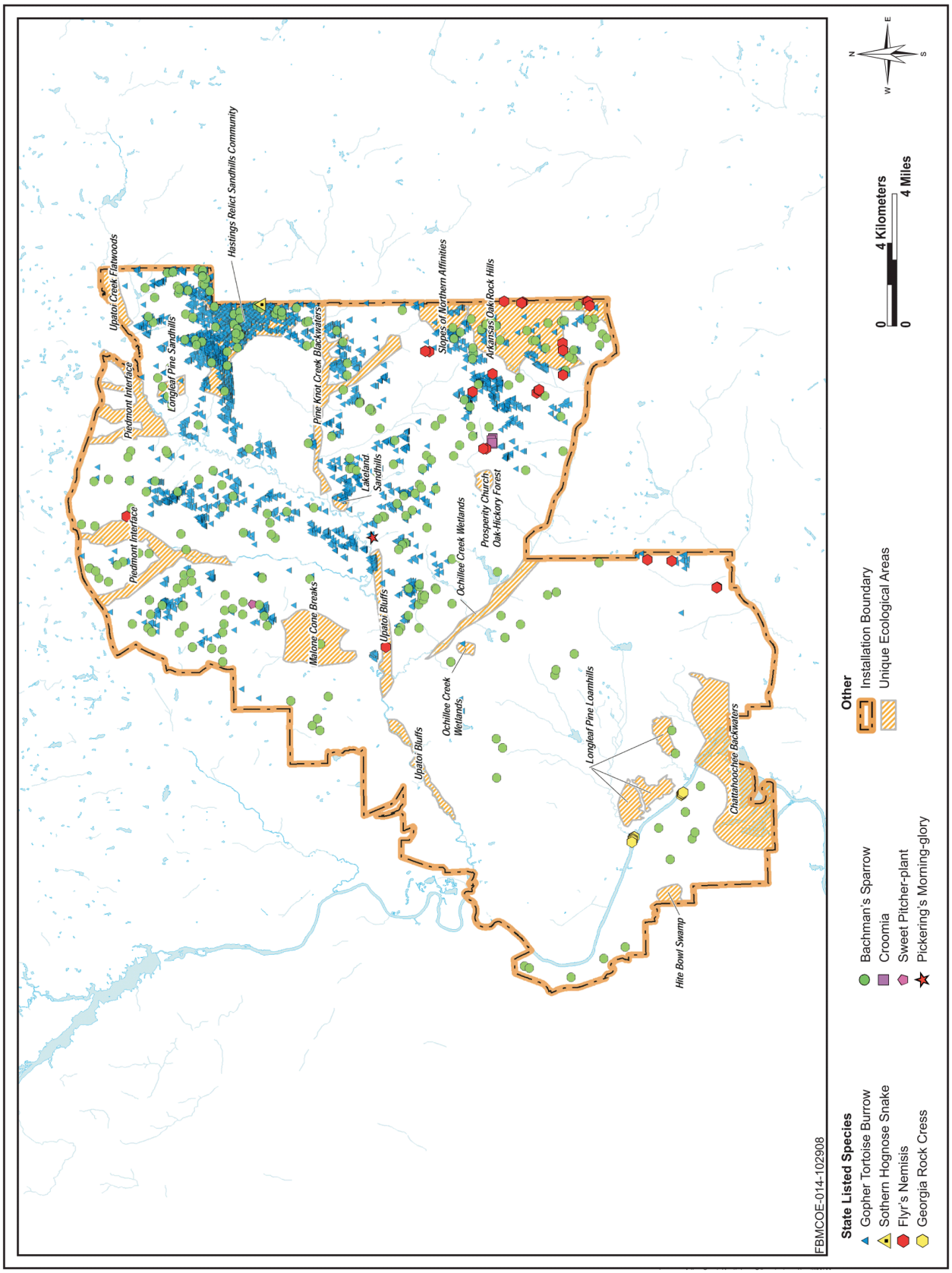


Figure 4.13-4: Known Occurrences of State-Listed Species and Unique Ecological Areas

Six federally listed or candidate species occur on Fort Benning. These are the Red-cockaded Woodpecker (Endangered), wood stork (*Mycteria americana*) (Endangered), bald eagle (*Haliaeetus leucocephalus*) (Delisted), American alligator (Threatened for due to similarity in appearance to the American crocodile), Georgia rockcress (*Arabis georgiana*) (Candidate), and relict trillium (Endangered). Species listed by Georgia as Threatened or Endangered include the gopher tortoise (Threatened), Barbour's map turtle (*Graptemys barbouri*) (Threatened), alligator snapping turtle (*Macrochelys temminckii*) (Threatened), and bluestripe shiner (*Cyprinella callitaenia*) (Threatened) and 11 plant species. Other animal species of conservation concern include various bird, reptile, fish, amphibious, mussel, insect, and plant species.

USFWS personnel conducted a survey in May and June of 2006 for four federally listed freshwater mussel species: the purple bankclimber (*Elliptoideus sloatianus*), shiny-rayed pocketbook (*Lampsilis subangulata*), Gulf moccasinshell (*Medionidus pencillatus*) and oval pigtoe (*Pleurobema pyriforme*) (USFWS 2006d). During this survey, no federally listed mussel species were found on the Installation. Many of the proposed road crossings have changed in location from those surveyed in 2006 and several have been added; however, based on findings of the 2006 surveys and past inventories of the Installation, the USFWS did not require that additional surveys be conducted, and these species are not considered further in this EIS.

AR 200-1 (*Environmental Protection and Enhancement*) implements within the Army the requirements of the ESA. The regulation requires ESMPs for listed and proposed species and critical habitat, a 100 percent inventory of suitable habitat for listed and proposed species that may occur on the Installation, and an initial thorough inventory of plants, fish, wildlife, and habitats on the Installation lands.

Fort Benning has an established ACUB Program which it implements through a cooperative agreement with TNC. The cooperative agreement, among other things calls for TNC, with Army assistance, to acquire land interests on private lands for the conservation of habitat for threatened, endangered, and sensitive species.Special-Status Plant Species

One federally listed plant species, relict trillium, eleven plant species listed by the State of Georgia as threatened or endangered, and more than 30 other species of conservation concern occur at Fort Benning (Fort Benning 2003b). Michaux's sumac (*Rhus michauxii*) was historically present in Muscogee County; however, this population has since been extirpated (USFWS 1993). There are currently no known occurrences on Fort Benning and this species is not considered further in this EIS. Table 4.13-2 lists these plant species, their conservation status, habitat preferences, and any known occurrence on Fort Benning. Species with federal status or listed by the State of Georgia as threatened or endangered are described in more detail below.

Relict Trillium (Federal Endangered)

Relict trillium is an herbaceous member of the lily family. Relict trillium is characterized by sessile flowers, curved stems, and prolonged, beaked stamens (USFWS 1990, Patrick *et al.* 1995). The spring flowers range in color from yellow to green and browning purple. The fruit is a round capsule that develops in early summer. Trillium plants die back to underground rhizomes after fruit maturation in summer and reemerge in spring.

Relict trillium grows in moist hardwood forests with little to no recent disturbance. This species is threatened by habitat loss due to residential and industrial development, roads and utility corridors, logging, agricultural conversion, and fires. The species is adapted to shaded conditions; thus, timber harvests or forest clearing can be detrimental to this species. Introduced species may also threaten relict trillium. Japanese honeysuckle and kudzu (*Pueraria lobata*) are aggressive invasive vines that encroach into hardwood habitat and replace native plant species. Feral swine can damage relict trillium by trampling, uprooting, and destabilizing soil.

There are five monitored populations of relict trillium in the northeastern-most areas of the Installation (USACE 2007a). Population areas range up to several acres in size and, in some cases, contain several thousand individuals. These areas are critical to the recovery of the relict trillium population. Populations at Fort Benning are essential for the continued viability of this species (Fort Benning 2001, 2003a). Current management activities for this species consist of surveys, monitoring efforts, and protection of sensitive areas. Management strategies on Fort Benning for this species are defined in an ESMP and consist of the following practices:

- Placing signs around relict trillium populations;
- Prohibiting digging and driving within and adjacent to known populations**;**
- Monitoring and control of kudzu and Japanese honeysuckle;
- Prohibiting timber harvest within 200 ft of known populations;
- Prohibiting prescribed burning within the boundaries of populations;
- Fencing to protect populations from feral swine; and
- Conducting additional surveys for unknown populations.

Table 4.13-2: Plant Species of Conservation Concern

Scientific Name	Common Name	Federal Status*	Georgia Status*	Habitat Preference, Occurrence on Fort Benning (# Mapped Locations, where available)
Federally Listed (Threatened/Endangered)				
Trillium reliquum	Relict trillium	E	E	Shaded, undisturbed sites in moist hardwood forests; 5 populations plus 2 isolated individuals mapped on the northeastern part of Installation; 2 suspected populations in compartments CC3 and P1 (7).
State Listed (Threatened/Endangered)				
Arabis georgiana	Georgia rockcress	C	T	Rocky bluffs, slopes and streambanks on sandy soils; Chattahoochee River (15).
Croomia pauciflora	Croomia		T	Moist deciduous woodlands, river channels, riparian areas; Upatoi Bluffs UEA and the Prosperity Church Oak-Hickory Forest UEA.
Myriophyllum laxum	Lax water-milfoil		T	Shallow, clear-water ponds, bogs, sinkholes and streams; Arkansas Oak Rock Hills and Upatoi Creek Flatwoods UEAs (6).
Nestronia umbellula	Indian olive		T	Open areas in dry-mesic hardwood and pine forests; occurrence unconfirmed.
Sarracenia rubra	Sweet pitcher plant		E	Open sites in moist woodlands, seeps, and wetland margins; Malone Cane Breaks UEA and northward in area O14**.**
Stylisma pickeringii pickeringii	Pickering's morning-glory		T	Open scrub-woodland habitat on sandy soils in the Fall Line; Lakeland Sandhills UEA.
Sedum nevii	Nevius' stonecrop		T	Thin frantic, limestone, or shale soils; Chattahoochee River bluffs; occurrence unconfirmed.
Sedum pusillum	Granite rock stonecrop		T	Granitic outcrops among mosses; occurrence unconfirmed.
Schisandra glabra	Bay star-vine		T	Twining over understory trees and shrubs or trailing over the ground in forested bottomlands and adjacent lower slopes; occurrence unconfirmed.
Rhododendron prunifolium	Plumleaf azalea		T	Moist soils of rich hardwood ravines; occurrence unconfirmed.
Hymenocallis coronaria	Shoals spider-lily		E	Rocky shoals and cracks in bedrock along river and stream courses; occurrence unconfirmed.
Brickellia cordifolia	Flyr's Nemesis		T	Mesic hardwood forests; Piedmont Interface, Upatoi Bluffs, and Arkansas Oak Rock Hills UEAs

Table 4.13-2: Plant Species of Conservation Concern

Scientific Name	Common Name	Federal Status*	Georgia Status*	Habitat Preference, Occurrence on Fort Benning (# Mapped Locations, where available)
Other Species of Conservation Concern				
Aesculus parviflora	Bottlebrush buckeye		SC	Rocky longleaf pine forests. Arkansas Oak Rock Hills UEA (7).
Agrimonia incisa	Incised agrimony		SC	Sandhills and pine scrub. Piedmont Interface, Pine Knot Creek Blackwaters, Prosperity Church Oak-hickory Forest, Arkansas Oak Rock Hills, Longleaf Pine Sandhills UEAs.
Baptisia megacarpa	Apalachicola wild indigo		SC	Riparian slopes, floodplain forests; occurrence unconfirmed.
Buchnera americana	Bluehearts		SC	Seepage bogs. Malone Cane Breaks UEA (10).
Carex lupuliformis	Hop sedge		SC	Wetlands, floodplain forests (7)
Carex stricta	Tussock sedge		SC	Wetlands, Ochillee Creek Wetlands UEA (8).
Chrysoma pauciflosculosa	Woody goldenrod		W	Sandy soil, scrub oak woodland, Lakeland Sandhills (14),
Cirsium virginianum	Virginia thistle		SC	Wet ecotones, longleaf pine (3).
Gymnopogon brevifolius	Broad-leaved beardgrass		SC	Dry clay loam soils, relict prairies Hastings Relict Sandhills Community, Longleaf Pine Sandhills UEAs (8).
Helenium brevifolium	Bog sneezeweed		SC	Seepage bogs, Pine Knot Creek Blackwaters, Malone Cane Breaks; occurrence unconfirmed.
Helianthemum canadense	Canadian frostweed		SC	Dry, sandy scrub and longleaf pine forest (3).
Helianthus smithii	Smith's sunflower		SC	Stream floodplains. Hastings Relict Sandhills Community (3).
Hexastylis shuttleworthii var. *harperi*	Harper's Wild ginger		U	Floodplain forests, wetland edges (4).
Hypericum canadense	Canada St. John's wort		SC	Wet, sandy soils, open woodlands meadows, wetland edges (10).
Iris brevicaulis	Lamance iris		SC	Seepage bogs (4).
Isoetes melanopoda	Black-footed quillwort		SC	Low woods, seepage bogs (2).
Melanthium latifolium	Broadleaf bunchflower		SC	Mesic hardwoods, slopes of Northern Affinities UEA (8).
Oldenlandia boscii	Bosc's Mille graines		SC	Wetlands and pond margins (1).
Panax quinquefolium	American ginseng		SC	Mesic hardwoods, Upatoi Bluffs, Prosperity Church Oak-hickory Forest UEA (8).
Phaseolus polystachios sinuatus	Sandhills bean		SC	Dry pine sandhills; occurrence unconfirmed.
Plantago sparsiflora	Pineland plantain		SC	Openings in wet pine woods, seeps; occurrence unconfirmed.
Quercus arkansana	Arkansas oak		SC	Longleaf pine rocky ridges, Arkansas Oak Rock Hills UEA (8).
Quercus georgiana	Georgia oak		W	Stone outcrops, slopes, and knolls; locations unmapped.
Quercus prinoides	Dwarf chinkapin oak		SC	Longleaf pine rocky ridges, Arkansas Oak Rock Hills UEA (7).
Rhynchospora scirpoides	Bullrush baldrush		SC	Wet sandy soils, stream banks; occurrence unconfirmed.
Rhynchospora stenophylla	Narrow-leaved beakrush		SC	Wet depressions and seeps; occurrence unconfirmed.
Spiranthes ovalis	October ladies-tresses		SC	Wet woodlands and seeps (1).

Table 4.13-2: Plant Species of Conservation Concern

Scientific Name	Common Name	Federal Status*	Georgia Status*	Habitat Preference, Occurrence on Fort Benning (# Mapped Locations, where available)
Trepocarpus aethusae	Trepocarpus, White nymph		SC	Floodplains, swamps. Chattahoochee Backwaters UEA (10).
Triadenum tubulosum	Broadleaf marsh St. John's wort		SC	Wetlands, seeps (1).
Tridens carolinianus	Carolina redtop		SC	Dry, open mixed pine woods (3).
Trillium decipiens	Mimic trillium		W	Moist woods, bluffs and slopes; occurrence unconfirmed.
Trillium underwoodii	Dwarf mottled trillium		W	Oak/hickory forest understory; occurrence unconfirmed.

Note: E = Endangered; C = Candidate; T = Threatened; SC = Special Concern; U = Unusual; W = Georgia Plant Watch List (Plants needing additional documentation to determine conservation status).
Sources: Fort Benning 2001, 2003a, GDNR 2006a, 2006b; Patrick et al. 1995.

Georgia Rockcress (Federal Candidate, Georgia Threatened)

Georgia rockcress is listed as a threatened species in the state of Georgia and is a candidate for federal listing. In 2006, its priority status was upgraded from 11 to 8 in response to increasing level of threat to this species (USFWS 2006). Georgia rockcress is a tall herbaceous plant with an erect stem and several basal leaves. White flowers bloom from May to June in a cluster at the end of the stem (Patrick *et al.* 1995). This species is found in dry areas, on rocky bluffs and slopes along watercourses, as well as along sandy, eroding stream banks. This species is able to populate thin soils and pioneer sites (USFWS 2005). Georgia rockcress is a light-loving species and will not tolerate prolonged shaded conditions (USFWS 2006).

Threats to this species include various forms of habitat degradation and disturbance. Timber harvest and road building can directly modify potential habitat. Ground disturbance also encourages encroachment by exotic plant species. Invasive plants, particularly Japanese honeysuckle, overtake populations of Georgia rockcress. An increased threat from invasive plants was cited by USFWS in support of the candidate priority upgrade (USFWS 2006).

On Fort Benning, Georgia rockcress can be found along both banks of the Chattahoochee River, which is generally outside of the area potentially affected by the action.

Indian Olive (GA Threatened)

Indian olive is a small, colonial shrub found primarily in dry, open, upland forests of mixed hardwood and pine. The species is dioecious, producing different flower types on male and female plants. Female flowers are solitary while male flowers occur in small clusters. Indian olive is known from about 16 locations in Georgia and is rare throughout its range, having sustained considerable habitat loss due to the clearing of forestland (McDonald 2006). Many of the remaining populations are of only a single sex, able to reproduce only asexually through root sprouting, and are therefore especially vulnerable to fragmentation of their habitat (Patrick *et al.* 1995). Management for Indian olive on Fort Benning is focused on forestry operation. The species may occur on the Installation in the ecological groups Dry-Mesic Hardwood and Dry Mesic Mixed Hardwood/Pine Forest. All known plants on Post are flagged prior to any timber harvests to prevent the plants from being disturbed by the use of heavy equipment. During 2008 surveys, new areas containing Indian Olive were identified, and continued efforts to prevent damage to these plants will occur.

Lax water-milfoil (GA Threatened)

Lax water-milfoil is a feathery, aquatic herb with emergent and submerged leaves. Leaf shape is extremely variable, with submerged leaves deeply incised and thread-like (Patrick *et al*. 1995). Lax water-milfoil grows in shallow freshwater ponds, bogs, sinkholes, and streams. The plant prefers clear water or spring-fed pools rather than pooling runoff with lower water quality. Lax water-milfoil occurs on Fort Benning in impounded water habitats in the Arkansas Oak Rock Hills UEA and Upatoi Creek

Flatwoods UEA. The species is threatened by activities that alter the water table or degrade water quality/water clarity (Patrick *et al*. 1995).

Sweet Pitcher Plant (GA Threatened)

The sweet pitcher plant (*Sarracenia rubra*) (Georgia Threatened) is a carnivorous plant that grows in moist woodlands, seepage areas, and wetland margins. It is found usually in areas exposed to full sun or light shade, and it may be crowded or shaded out by invading shrub and tree species unless an opening is maintained by manual thinning or periodic fire. The species is threatened in Georgia because of wide-scale habitat destruction. Mechanical site disturbances, such as drainage or logging, tend to destroy populations. An appropriate fire regime is also important in maintaining suitable habitat for this species. Recently, pitcher plant collection for the floral arrangement industry is posing a new problem (Fort Benning 2001, 2003a).

The sweet pitcher plant is found on Fort Benning in the Malone Cane Breaks UEA and northward in training compartment O14 where clay pans under the soil surface have created favorable growing conditions (Fort Benning 2001, 2003a). Management efforts include eliminating invading woody vegetation and yearly population surveys. TNC developed recommended management plans for each of Fort Benning's populations of the sweet pitcher plant (Streich and Kemp 1994a, b). The Malone Cane Breaks UEA contains most of Fort Benning's sweet pitcher plants. None of the proposed projects are in this area. Sweet pitcher plant occurs in the proposed Heavy Maneuver Area - North and associated road construction projects in area O14 (Fort Benning 2001, 2003a). A new population of sweet pitcher plants has recently been found in O-9 just north of project PN65383 (Thornton, 2008).

Croomia (GA Threatened)

Croomia is a leafy perennial herb growing from rhizomes in intertwined patches. Croomia is found in moist deciduous woodlands, river channels, and riparian areas (Patrick *et al*. 1995). It is rare throughout its range and has sustained substantial habitat loss due to the clearing of forests for conversion to agriculture or pine plantations (Fort Benning 2001, 2003a). Exotic invasives, such as Japanese honeysuckle, may also encroach into croomia habitat. The species is found in dry-mesic hardwood forest at two sites on Fort Benning: the Upatoi Bluffs UEA and the Prosperity Church Oak-Hickory Forest UEA. The proposed Heavy Maneuver Corridor – South is partially within the Prosperity Church Oak-Hickory Forest UEA. No project activity is proposed within the Upatoi Bluffs UEA, but construction, range activities, and the driver training area are within close proximity to this region.

Pickering's Morning Glory (*Stylisma pickeringii pickeringii*) (GA Endangered)

Pickering's morning glory is a perennial, creeping vine. The stems sprawl over the ground from a central crown, and branch extensively, forming an intertwined network of trailing stems. The leaves are held upright, with the base tapering to a short leafstalk (Fort Benning 2001, 2003a; Patrick *et al*. 1995). The flowers are white and funnel shaped. The species is found in coarse, white sands on sandhills near the Fall Line. These are scrub habitats with scant litter accumulation, sparse ground cover, and a thin canopy of scattered oaks and pines. The species is in decline due to habitat destruction. Fort Benning's

management strategy for this species is to control encroachment of woody vegetation through prescribed burning and timber thinning, which should be beneficial to this light-loving plant (Patrick *et al*. 1995).

The largest known concentrations of Pickering's morning glory on Fort Benning are found in the Lakeland Sandhills UEA (Fort Benning 2001, 2003a). Pickering's morning glory habitat does not occur in the area potentially affected by the Proposed Actions.

Shoals spider-lily (*Hymenocallis coronaria*) (GA Endangered)

Shoals spider-lily is an emergent wetland plant that grows along streams, rivers, rocky shoals and cracks in bedrock. Alterations in stream flow and degradation in water quality are threats. The species is also sensitive to sediment and turbidity (Patrick *et al*. 1995). Surveys for plant species of concern were conducted in 2006 over the areas potentially affected by the proposed alternatives. Shoals spider-lily was not detected (USFWS 2006).

Plumleaf azalea (*Rhododendron prunifolium*) (GA Threatened)

Plumleaf azalea is adeciduous shrub produces bright flower clusters. It grows in moist soils of hardwood ravines and may be found in the Piedmont Interface UEA. Disturbance due to logging and horticultural collection are threats to this species (Patrick *et al*. 1995). Plumleaf azalea was not detected in the areas potentially affected by the proposed alternatives (USFWS 2006).

Bay Star-vine (*Schisandra glabra*) (GA Threatened)

Bay star-vine grows on slopes and bottomlands in rich forest. It is a sprawling or climbing vine that grows over understory trees and shrubs. Invasion by exotic species is a threat to this plant (Patrick *et al*. 2005). Bay Star-vine was not detected in the areas potentially affected by the proposed alternatives (USFWS 2006).

Granite Rock Stonecrop (*Sedum pusillum*) (GA Threatened)

Granite rock stonecrop grows over granitic outcrops in the shade of taller vegetation or rock structures. It often appears in association with eastern red cedar. Invasion by exotic weeds is the most notable threat to the granite rock stonecrop (Patrick *et al*. 1995). Granite Rock Stonecrop was not detected in the areas potentially affected by the proposed alternatives (USFWS 2006).

Nevius' Stonecrop (*Sedum nevii*) (GA Threatened)

Nevius' stonecrop grows in shallow soil over granite substrate. It appears on steep bluffs along Chattahoochee River. As with other native plants, exotic weeds are a threat (Patrick *et al*. 1995). Nevius' Stonecrop was not detected in the areas potentially affected by the Proposed Action alternatives (USFWS 2006).

Flyr's Nemesis (*Brickellia cordifolia*) (GA Threatened)

Flyr's Nemesis is a vascular flowing plant that grows in well-drained fine sandy loams, typically in pine-hardwood and oak-hickory woods or upland hammocks, and sunny openings in hammocks (NatureServe 2008). Flyr's Nemesis is found within Piedmont Interface UEA, Upatoi Bluffs UEA, Arkansas Oak Rock Hills UEA, and longleaf pine sandhills.

Special Status Animal Species

Table 4.13-3 lists the special status animal species and their conservation status. Habitat preference and species occurrence at Fort Benning is included where data are available. Detailed discussion is provided for federally listed species and state-listed species.

Red-cockaded Woodpecker (RCW) (Federal Endangered)

The RCW was listed as endangered in 1970 due to its rarity, documented declines in local populations and reductions in available nesting habitat. Although populations have become more fragmented and isolated, the RCW is still found in all southern and southeastern coastal states from eastern Texas into southern Virginia, and small interior populations are found in southeastern Oklahoma and southern Arkansas, and until recently, southeastern Kentucky. The largest populations are in the coastal plain forests of the Carolinas, Florida, Georgia, Alabama, Mississippi, Louisiana, eastern Texas, and in the Sandhills forests of the Carolinas (USFWS 1999).

RCWs are non-migratory residents, with a social structure that involves a breeding pair and helpers that assist with cavity excavation and maintenance, egg incubation, feeding young, and defending the group's territory. Nesting generally occurs from April through June with some re-nesting attempts observed as late as July. Groups of RCWs nest in an aggregation of cavity trees called a cluster that is surrounded by contiguous foraging habitat. RCW clusters are typically defined as "active", "inactive," or "captured." An active cluster is an aggregation of trees with fresh cavities that are currently used by RCW. An inactive cluster is consists of abandoned cavity trees which can be managed for recolonization. Inactive clusters can be managed or restored to provide habitat for recolonization. A captured cluster contains cavity trees that do not support a breeding group, but are used by a neighboring group of RCW (USFWS 2006). Discrete cluster sites are typically located where mature pine trees are more than 60 years old. Foraging habitat however, is more variable with timber taking on increasing value as the stands age past 30 years. Both nesting and foraging habitat can be characterized as open stands of pine with a scarce to moderate midstory. As the midstory becomes dense or reaches the height of cavities, cluster abandonment and decreased foraging value results.

Fort Benning has one of the largest RCW populations in the southeastern United States. The RCWs are well dispersed over the Installation, except that no active clusters are located on the Alabama portion of

Table 4.13-3: Special-Status Animal Species

Class	Scientific Name	Common Name	Federal Status*	GA Status*	Habitat Preference, Occurrence at Fort Benning (# Mapped Locations)
Federally Listed					
Bird	*Haliaeetus leucocephalus*	Bald eagle	Delisted	T	Forested edges of lakes, estuaries, and large rivers. River Floodplains and Cypress/Tupelo Swamps. Chattahoochee Backwaters UEA (2).
Bird	*Mycteria americana*	Woodstork	E	E	Marshes, river swamps, shrub wetlands; nests in cypress or dead hardwoods. Known in vegetation and aquatic communities: River Floodplains and Cypress/Tupelo Swamps. Chattahoochee Backwaters and River Floodplains and Cypress/Tupelo Swamps UEA (3).
Bird	*Picoides borealis*	Red-cockaded Woodpecker	E	E	Open mature pine woodlands, pine savannahs. Nests in mature pine with low understory vegetation. Known in vegetation communities: Longleaf Pine Sandhills, Longleaf Pine Loamhills, and Plantations and Other Altered Areas. Hastings Relict Sandhills Community, Longleaf Pine Sandhills, Lakeland Sandhills, Longleaf Pine Loamhills, Malone Cane Breaks UEAs (see Figures).
Reptile	*Alligator mississippiensis*	American alligator	T (S/A)	SC	Fresh and brackish marshes, ponds, lakes, and rivers. Known in vegetation and aquatic communities: Impounded Water, River Floodplains and Cypress/Tupelo Swamps, Chattahoochee Backwaters UEA.
State Listed					
Bird	*Aimophila aestivalis*	Bachman's sparrow		R	Open pine or oak woodlands, old fields, mature old growth pine woodland with frequent fires. Known in the following vegetation communities: Dry-mesic hardwood and dry-mesic mixed hardwood/pine forest, longleaf pine loamhills, longleaf pine sandhills, plantations and other altered areas, small stream swamps and wooded seepage bogs, Hastings Relict Sandhills Community UEA, Longleaf Pine Sandhills UEA, Longleaf Pine Loamhills UEA (272).
Reptile	*Gopherus polyphemus*	Gopher tortoise		T	Sandy soils in pine forest and grassy understory. Known in vegetation and aquatic communities: Dry mesic Hardwood and Dry-mesic Mixed hardwood/Pine Forest, Longleaf Pine Loamhills, Longleaf Pine Sandhills, Plantations and Other Altered Areas, Successional Upland Deciduous Mixed Forest, Small Stream Swamps and Wooded Seepage Bogs. Hastings Relict Sandhills Community, Longleaf Pine Sandhills, Lakeland Sandhills, Slopes of Northern Affinities, Pine Knot Creek Blackwaters UEAs (2661).

Table 4.13-3: Special-Status Animal Species

Class	Scientific Name	Common Name	Federal Status*	GA Status*	Habitat Preference, Occurrence at Fort Benning (# Mapped Locations)
Reptile	*Graptemys barbouri*	Barbour's map turtle		T	Low-gradient rivers and swamps in the Apalachicola River system. Chattahoochee Backwaters UEA (2).
State Listed (Continued)					
Reptile	*Macrochelys temminckii*	Alligator snapping turtle		T	Rivers, lakes, and ponds near vegetated wetlands. Chattahoochee Backwaters and River Floodplains and Cypress/Tupelo Swamps UEA (12).
Fish	*Cyprinella callitaenia*	Bluestripe shiner		T	Medium to large rivers; undisturbed but unvegetated areas (19).
Other Species of Conservation Concern					
Bird	*Egretta caerulea*	Little blue heron		SC	Herbaceous wetland and surrounding forested areas. Unknown distribution at Fort Benning.
Bird	*Elanoides forficatus*	Swallow-tailed kite		R	Vegetated wetlands, pine woodlands. Unknown distribution at Fort Benning.
Bird	*Falco sparverius paulus*	Southeastern American kestrel		SC	Open pine woodlands with dead snags; cleared areas, burned areas. Known in vegetation communities: Longleaf Pine Sandhills, Plantations and Other Altered Areas, and Successional Upland Deciduous Mixed Forest. Lakeland Sandhills UEA (25).
Bird	*Lanius ludovicianus migrans*	Migrant loggerhead shrike		SC	Open woods, field edges, scrub/scrub with scattered trees. Known in vegetation communities: Plantations and Other Altered Areas (7).
Bird	*Nyctanassa violacea*	Yellow-crowned night heron		SC	Herbaceous woodland and forested wetlands. Unknown distribution at Fort Benning.
Bird	*Nycticorax nycticorax*	Black-crowned night heron		SC	Herbaceous wetlands, wooded streams and rivers. Unknown distribution at Fort Benning.
Bird	*Pandion haliatus*	Osprey		SC	Herbaceous wetlands, riparian areas, snags and hollow trees near water. Chattahoochee Backwaters and River Floodplains and Cypress/Tupelo Swamps UEAs (1).
Reptile	*Eumeces anthracinus*	Coal skink		SC	Mesic forests near bodies of water. Unknown distribution at Fort Benning.
Reptile	*Eumeces egregius*	Mole skink		SC	Pine, hardwood, and mixed woodlands in sandy soils. Unknown distribution at Fort Benning.
Reptile	*Crotalus adamanteus*	Eastern diamondback rattlesnake		SC	Mixed pine successional woodland, old fields, longleaf pine, favors areas with abundant cover. Hastings Relict Sandhills Community UEA (17).

Table 4.13-3: Special-Status Animal Species

Class	Scientific Name	Common Name	Federal Status*	GA Status*	Habitat Preference, Occurrence at Fort Benning (# Mapped Locations)
Reptile	*Micrurus fulvius*	Eastern coral snake		SC	Burrows and fallen logs, riparian pine, hardwood, and mixed woodlands (2).
Other Species of Conservation Concern (Continued)					
Reptile	*Heterodon simus*	Southern hognose snake		T	Fallow fields and scrub pine woodlands, well drained riparian and xeric flatwoods. Hastings Relict Sandhills Community UEA (2).
Reptile	*Pituophis melanoleucus mugitus*	Florida pinesnake		SC	Burrows and fallen logs, pine and mixed woodlands; uses gopher tortoise burrows. Known in vegetation communities: Longleaf Pine Sandhills and Plantations and Other Altered Areas. Hastings Relict Sandhills Community UEA (38).
Fish	*Lythrurus atrapiculus*	Blacktip shiner		SC	Pools and backwater areas in small- to medium-sized creeks, over sandy substrates.
Fish	*Ameiurus serracanthus*	Spotted bullhead		R	Medium to large rivers; deep holes with rock, sand, or mud substrate (2).
Fish	*Etheostoma parvipinne*	Goldstripe darter		R	Springs, seepage creeks; vegetated benthos.
Fish	*Pteronotropis euryzonus*	Broadstripe shiner		R	Brownish water creeks and pools; near vegetation or debris (263).
Fish	*Micropterus cataractae*	Shoal bass		SC	Shoals and riffles of large streams to rivers.
Amphibian	*Rana capito sevosa*	Dusky gopher frog		SC	Pine scrub in sandhills, near water; uses gopher tortoise burrows. Hastings Relict Sandhills Community.
Amphibian	*Desmognathus apalachicola*	Apalachicola salamander		SC	Stream floodplains, small stream swamps and seepage bogs. Unknown distribution at Fort Benning.
Amphibian	*Eurycea longicauda guttolineata*	Three-lined salamander		SC	Hardwood forest floodplains and wetlands. Unknown distribution at Fort Benning (1).
Mammal	*Myotis austroriparius*	Southeastern myotis		SC	Pine, hardwood, and mixed forest; dead snags and hollow trees. Unknown distribution at Fort Benning (1).
Mammal	*Neotoma floridana* ssp *haematoreia*)	Eastern woodrat		SC	Mature lowland hardwoods, riparian forests, brushy or wooded wetlands. Unknown distribution at Fort Benning.
Mammal	*Neotoma floridana* ssp. *illinoensis*	Southern Appalachian woodrat		SC	Mature lowland hardwoods, riparian forests, brushy or wooded wetlands. Unknown distribution at Fort Benning.

Table 4.13-3: Special-Status Animal Species

Class	Scientific Name	Common Name	Federal Status*	GA Status*	Habitat Preference, Occurrence at Fort Benning (# Mapped Locations)
Mammal	*Tadarida brasiliensis*	Brazilian free-tailed bat		SC	Dead snags, hollow trees, abandoned buildings, caves, culverts, and bridges. Unknown distribution at Fort Benning.
Mussel	*Anodonta heardi*	Apalachicola floater		SC	Streams; not known from potentially affected areas.
Insect	*Onthophagus polyphemi*	Tortoise commensal scarab		SC	Gopher tortoise burrows in sandy forest soils. Unconfirmed occurrence at Fort Benning.
Crustacean	*Cambarus sp. Procambarus sp.*	Crayfish Species		SC	Aquatic benthos, unknown distribution at Fort Benning

Note: E = Endangered; C = Candidate; T = Threatened; S/A = Similarity of Appearance; SC = Special Concern; R = Rare
Sources: Fort Benning 2001, 2003a, GDNR 2003, 2006a, 2006b; NatureServe 2006; USFWS 2006b-e.

the Installation. The RCWs are known to occur in several vegetation types within the project areas, including longleaf pine sandhills, other altered areas, and Longleaf Pine Loamhills UEA (Fort Benning 2006g). In September 1994, the USFWS issued a (Jeopardy) Biological Opinion (BO) determining that the ongoing military training and related activities at Fort Benning jeopardized the continued existence of the Installation's RCW population. Since that time, intensive efforts have been made to enhance management activities as outlined in the Reasonable and Prudent Alternatives section of the USFWS' 1994 Jeopardy BO.

On September 27, 2002, the USFWS approved Fort Benning's ESMP for the RCW and issued a BO that included specific management activities. This relieved Fort Benning of the 1994 Jeopardy BO and allowed the implementation of the "1996 Management Guidelines for the RCW on Army Installations." Fort Benning is also one of 13 primary core locations selected by the USFWS to manage for a RCW recovery population (421 clusters for Fort Benning).

The 2003 Recovery Plan (USFWS 2003) and 2007 RCW Guidelines (DA 2007) recommend an annual increase of 5 percent in the total number of active clusters, to be achieved by providing a number of unoccupied recruitment clusters equal to 10 percent of the total number of active clusters. In 2008, Fort Benning had 10 unoccupied recruitment clusters with 4 suitable cavities each, which is 3.5 percent of the number of active clusters on the Installation (284) (Fort Benning Conservation Branch unpub. data). Additionally, according to the 1996 Guidelines, any Installation discovering a 5 percent decline in the total number of active clusters must notify USFWS and reinitiate consultation (DA 1996). The 2007 Guidelines increase this threshold to a 10 percent decline in total active clusters either from the previous year or over a 5 year period (DA 2007). In 2008, the Fort Benning RCW population showed a 2.5 percent increase in active clusters and a 3.4 percent increase in the number of Potential Breeding Group (PBGs) since 2006. A PBG is an adult male and adult female that occupy the same cluster whether or not they attempt to nest or successfully fledge young. Since 2003, the Fort Benning population has shown a steady increase and averages 2.7 percent increase in active clusters and 4.2 percent increase in the number of PBGs per year (Fort Benning Conservation Branch unpub. data).

The management and current status of RCWs on Fort Benning, and of clusters in areas potentially affected by the Proposed Action, were evaluated in 2008 (USACE 2008). In July 2008, the number of managed clusters was 307, consisting of 271 PBGs, 1 solitary RCW, 5 captured clusters and 23 inactive clusters (Fort Benning Conservation Branch unpub. data). Figures 4.13-5 and 4.13-6 show the distribution of clusters on the Installation with respect to Alternatives A and B.

Wood Stork (Federal Endangered)

Wood storks are seasonal visitors to Fort Benning, seen mainly in gum/oak ponds on the Alabama portion of the Installation during late summer. Usually, 1 to 20 birds are seen each year. They use shallow water ponds or Chattahoochee River backwaters depending on available food supplies and appropriate water levels. In 1996, USFWS personnel discovered a roost in military training compartment X5, which was the first known occurrence on Fort Benning (Fort Benning 2001, 2003a). Over the next several weeks,

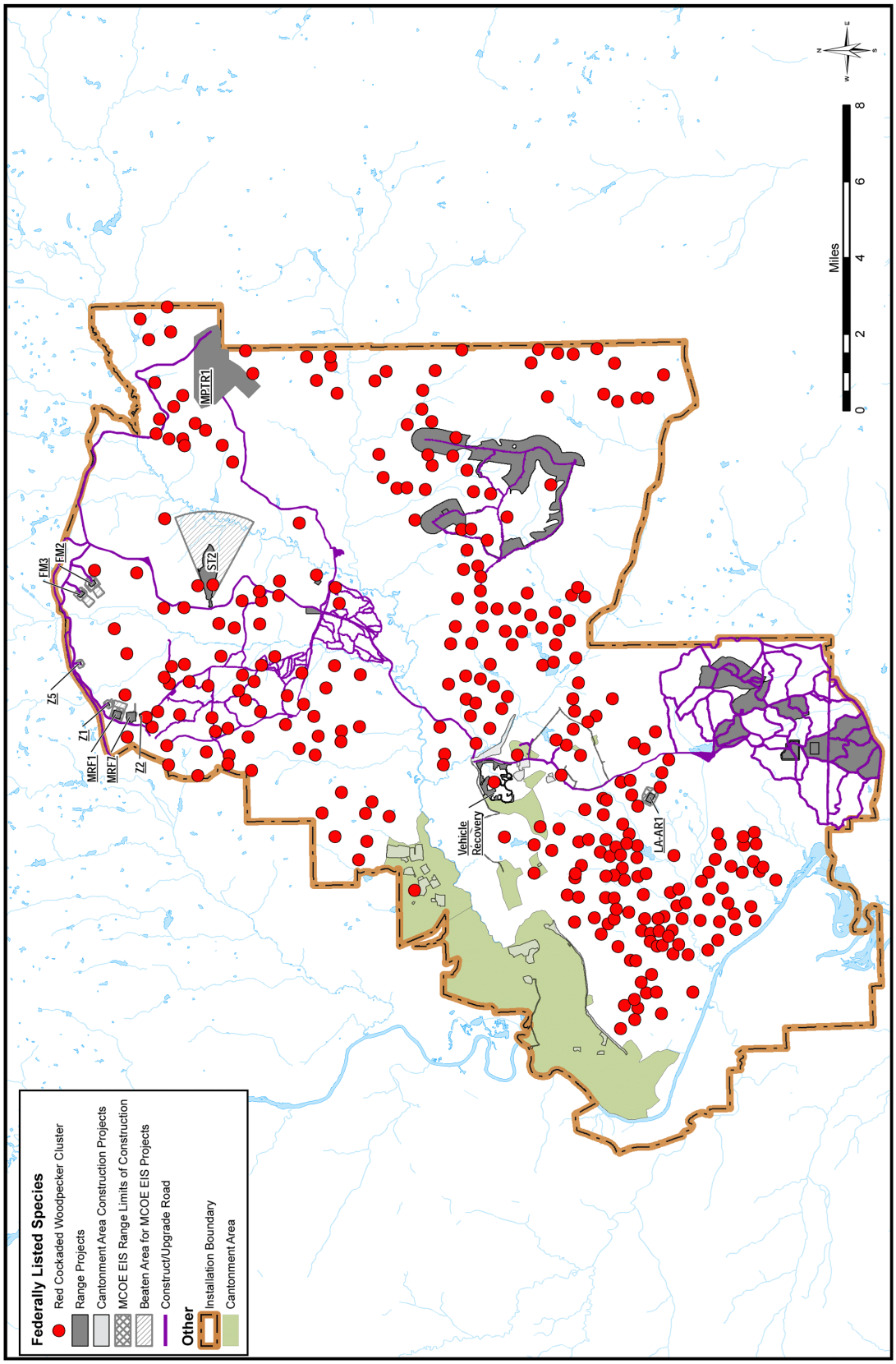


Figure 4.13-5: Red-cockaded Woodpecker Clusters Under Alternative A

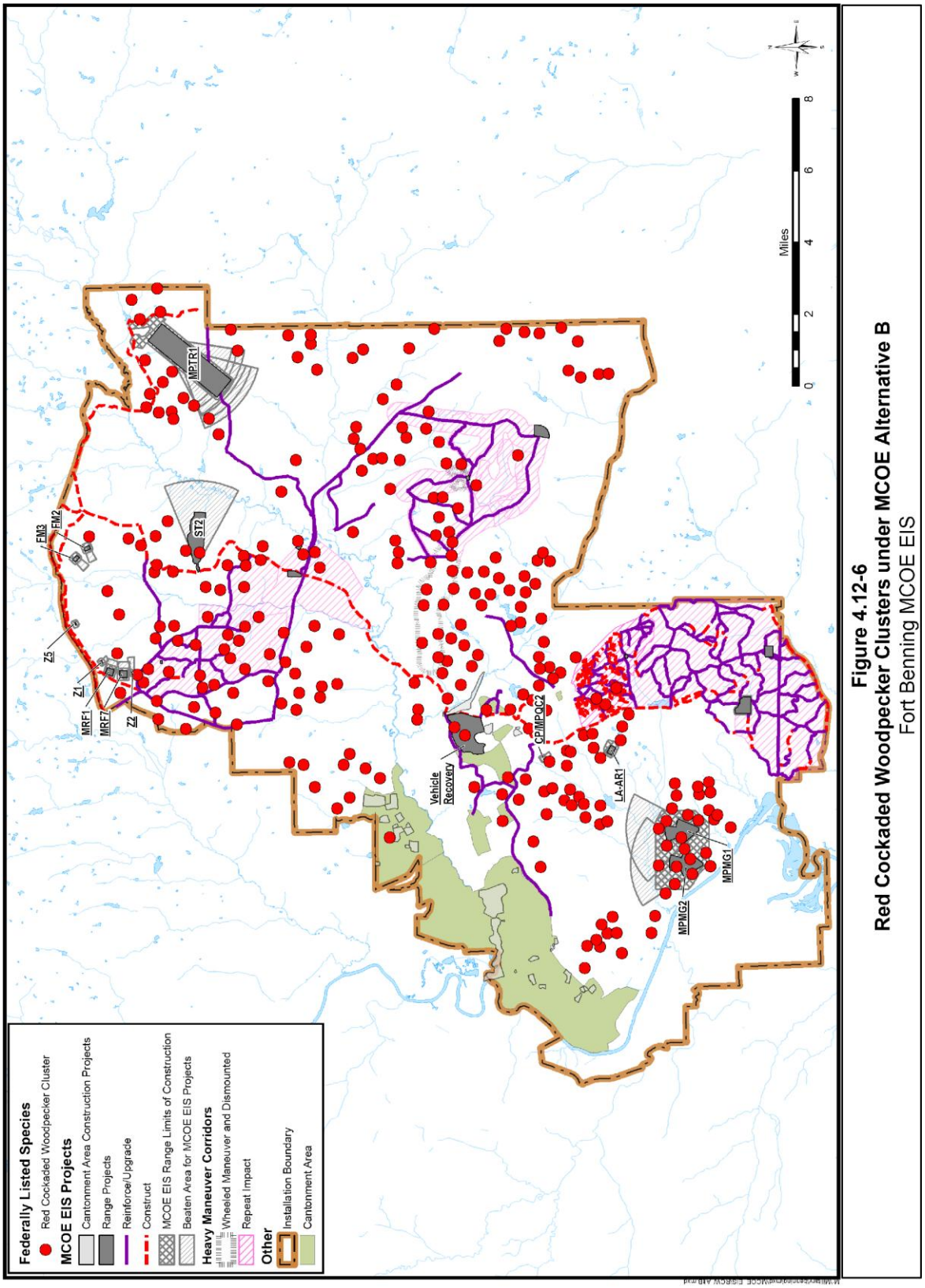


Figure 4.13-6: Red-cockaded Woodpecker Clusters Under Alternative B

Natural Resource Management Branch and USFWS personnel sighted several individuals on the Alabama portion of Fort Benning, in compartments X3, X5, Z1, and Z4. No wood storks were observed in 2005, whereas three were seen in compartment X5 in 2006. Wood storks were not observed in 2006 surveys of areas affected by Proposed Action.

The management strategy for the wood stork on Fort Benning, detailed in an ESMP, consists of maintaining the current transient population and protecting the habitat in which they temporarily live and feed. Current management activities consist of surveys, monitoring efforts, and protection of sensitive areas (Fort Benning 2001, 2003a, 2007c).

Bald Eagle (Federally Delisted, GA Threatened)

Bald eagles are no longer protected under the Endangered Species Act; however, they are still protected under the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d). Since they are still federally and state protected, and for consistency with the Transformation documents, they are included in this analysis.

A pair of bald eagles' nest on the southern edge of the Installation, near the Chattahoochee River in the Chattahoochee Backwaters UEA. Eagles have produced at least one juvenile (or young) per year since the first nest was discovered in 1992. In 2006, a pair of bald eagles successfully fledged two nestlings from the nest in compartment A14. A former nest site in CC2 is no longer present (USACE 2007a; USACE 2007). The active nest is located in training compartment A14. Activities in compartments A14, A21, and CC2 are restricted from December 1 through May 31 to protect the nest sites.

Management strategy on Fort Benning for the bald eagle is detailed in an ESMP and consists of maintaining the integrity of their habitat and feeding sources in order to eventually increase the number of nesting pairs from one to two. Current management activities consist of surveys, monitoring efforts, and protection by limiting potentially disturbing activities within primary (1,500 ft) and secondary (one mile) buffer zones around nest sites (Fort Benning 2001, 2003a). Bald eagle surveys were conducted in suitable habitat in 2006 and 2008 by USFS and Jay Carter Associate (JCA) biologists, respectively, in the proposed project areas. No bald eagles or bald eagle nests were observed during the surveys (USFS 2006; personal communication, JCA Biologist 2008). No proposed projects are within the vicinity of any known bald eagle nests under Alternative A. Under Alternative B, heavy maneuver training within the Good Hope Maneuver Area will occur just outside (1.03 miles) of the 1 mile secondary zone.

Bachman's Sparrow (*Aimophila aestivalis*) (GA Rare)

The Bachman's sparrow is a small bird with a streaked brown back, a white underbelly, and a pale bill. It is a year-round resident and lives in the open pinewoods of the northern portion of the Installation. During the USFWS Terrestrial Survey (USFWS 1999), 272 male Bachman's sparrows were identified by calls in training areas throughout the Installation. Habitat quality for this species is good and abundant on Fort Benning due mainly to the widespread use of prescribed fire, which promotes the open pine forests in which this species thrives. Avian habitat evaluations performed at Fort Benning suggest that Bachman's sparrow may be more common in recently burned sites (Duncan *et al.* 2004).

Known populations of Bachman's sparrow exist in the project areas in Pine Knot Creek Blackwaters UEA and Hastings Relict Sandhills Community UEA, and in the following vegetation community types: dry-mesic hardwood and dry-mesic mixed hardwood, longleaf pine loamhills, longleaf pine sandhills, plantations, small stream swamps, wooded seepage bogs, and other altered areas (Fort Benning 2006g). Bachman's sparrow is not known in any non-range construction project areas but it does inhabit the Heavy Maneuver Area–North, Heavy Maneuver Corridor–South, Tank/Fighting Vehicle Stationary Gunnery Range 2, and Tank/Fighting Vehicle Stationary Gunnery Range 2 (Fort Benning 2006g).

American Alligator (Federal Threatened for Similarity in Appearance)

The American alligator was first listed on March 11, 1967. In 1987, the USFWS pronounced the American alligator fully recovered and it was removed from the endangered species list. However, the alligator is still listed as Threatened due to "Similarity in Appearance", because some related species (several species of crocodiles and caimans) still need protection. For this reason, the USFWS regulates legal trade in alligator skins and products made from alligators in order to protect crocodile and caiman species that have skin that is similar in appearance (USFWS 2006f).

Fort Benning is located on the extreme northern limit of the American alligator's range. Large adults up to 13 ft have been observed. Habitat available to the alligator is limited and consists of fishponds and beaver ponds and the backwaters, sloughs, and creeks of the Chattahoochee River (Fort Benning 2001, 2003a). Known occurrences include compartment X-5 on the Alabama side of the river and Averett's, Kings, Twilight, and Clear Creek ponds (USACE 2007a) on the Georgia portion of the Installation. The Proposed Action alternatives overlap one known occurrence of the American alligator.

Fort Benning has an ESMP for the American alligator. Basic management for this species consists of maintaining a stable population and maintaining the habitat in which it lives and feeds. Current management activities consist of surveys, monitoring efforts, and protection and maintenance of alligator habitat (Fort Benning 2001, 2003a).

Gopher Tortoise (GA Threatened)

The gopher tortoise occurs in the sandy soil habitats found only in the northern two thirds and southeastern tip of the Installation. A dry land turtle, the gopher tortoise (tortoise) has a high, domed shell with shell lengths of up to 15 inches. They have stubby, elephant-like hind feet and flattened front feet with large claws for digging. They favor dry, sandy ridges with open stands of longleaf pine, turkey oak, and other scrub oaks. They also frequent open areas around road shoulders, food plots, and rights-of-way, which have well drained sandy soil. The tortoises dig long sloping burrows up to 30 ft long and extending up to 9 ft below the surface. These dens are used as shelter by tortoises, as well as by a variety of other sandhill residents, including the eastern diamondback rattlesnake, dusky gopher frog (*Rana sevosa*), and commensal scarab beetle (*Onthophagus polyphemi*). They feed on grasses and other plant material near the ground. Feeding trails are often visible leading from the den's sandy apron to foraging areas. Eggs are laid in or near the den apron in May, June, and July and hatch

after 80-100 days of incubation. Young tortoises are about the size of silver dollars and are very vulnerable to predation by crows, raccoons, opossums, foxes, skunks, and other animals. Over 8,200 tortoise burrows have been documented to date on Fort Benning.

Gopher tortoise management on Fort Benning consists of burrow and habitat protection. In areas with high vehicular traffic, "Sensitive Area" signs are posted around known active and inactive tortoise burrows, totaling 150 acres, and the burrows are also marked. These sites are located primarily in mechanized training areas. Digging activities and vehicles are required to stay 50 ft away from the burrows to protect the integrity of the burrow area (Fort Benning 2004b). Based on surveys by the U.S. Forest Service (USFS), the gopher tortoise is present throughout the Installation, with a substantial number of active burrows (2,661 active burrows). Active gopher tortoise burrows were observed in scrub oak and sandy open stands throughout the action areas for Alternative A and B. Burrows were also found to a lesser extent in upland pine stands, usually with an open canopy and sandy or sandy loam soils. As expected, Gopher tortoise burrows were typically not found when canopy density was high or when the composition of the soil was predominantly clay. The gopher tortoise burrows found within the action areas were primarily adult burrows. Juvenile burrow were less prevalent (USFWS 2006b).

The gopher tortoise is known to occur in mesic hardwood forests, dry-mesic hardwood and dry-mesic mixed hardwood/pine forest, longleaf pine loamhills, longleaf pine sandhills, plantations, other altered areas, and successional upland deciduous or mixed forest (Fort Benning 2006g). They are also known in the following UEAs: Hastings Relict Sandhills Community, Longleaf Pine Sandhills, and Pine Knot Creek Blackwaters (Fort Benning 2006g). Known tortoise locations in proposed project areas include: Battle Command Training Center (Harmony Church 2012), Drivers Training Area, Heavy Maneuver Area North, Heavy Maneuver Corridor – South (2007-2010), Tank/Fighting Vehicle Stationary Gunnery Range 2, and Tank/Fighting Vehicle Stationary Gunnery Range 1 (Fort Benning 2006g).

Other Reptiles

The alligator snapping turtle and Barbour's map turtle are aquatic reptiles identified as Threatened by the State of Georgia. Primary habitat is in Chattahoochee Backwaters UEA, which is outside of the Proposed Action area.

Bluestripe Shiner (*Cyprinella callitaenia*) (GA Threatened)

The bluestripe shiner is a small (7 cm) member of the minnow/carp family. It is endemic to the Chattahoochee River basin and is listed as a threatened species by the State of Georgia. This species inhabits medium and large streams and rivers with moderate gradient and little to no aquatic vegetation. Bluestripe shiners spawn in summer months, laying eggs in crevices on the river bed (NatureServe 2006). In the Chattahoochee River system, sensitive fish species including shiners have been shown to prefer pristine, undisturbed stream segments and were not found in degraded headwaters (Holcomb 2005).

Dusky Gopher Frog (GA Species of Concern)

The dusky gopher frog is one of four amphibian species of concern occurring at Fort Benning (Fort Benning 2001, 2003a) (Table 4.13-4). None of the four is federally or state listed, but the dusky gopher frog is of particular interest because a distinct population segment of this subspecies is federally listed as endangered in Alabama, Mississippi, and Louisiana (USFWS 2001). The INRMP describes management strategies for this species because the population is regionally unique and may become a candidate for federal listing (Fort Benning 2001, 2003a).

A population of dusky gopher frogs occurs on Fort Benning in the pine scrub and sandhills habitat within training compartments K14, K15, and K17. The dusky gopher frog shares this type of habitat with the gopher tortoise, a Georgia threatened species. The frogs may use gopher tortoise burrows during the day for shelter, emerging at night to feed (NatureServe 2008). The dusky gopher frog is primarily terrestrial, but is found in association with shallow breeding ponds and wetland areas. Threats to this species include habitat loss/fragmentation, disease, and periods of dry weather. The population of dusky gopher frogs at Fort Benning is extremely isolated on the Installation, and may be the only sub-population in existence in the Upper Coastal Plain (Fort Benning 2001, 2003a). As such, the population may be vulnerable to local and regional disturbances. Tracking studies of the population at Fort Benning indicated that dusky gopher frogs show strong site fidelity and are centered in the K14 and K17 training compartments. Ongoing training in K15 and Hastings Range does not appear to negatively affect the species (Fort Benning 2001, 2003a).

Southern Hognose Snake (*Heterodon simus*) (GA Threatened)

The Southern hognose snake is dark-blotched, stocky snake with a sharply upturned snout and unpatterned belly. The snake burrows in soil and inhabits open, xeric habitats with well-drained, sandy or sandy-loam soils such as sand ridges, stabilized coastal sand dunes, pine flatwoods, mixed oak-pine woodlands and forests, scrub oak woods, and oak hammocks; also old fields and river floodplains (NatureServe 2008). The southern hognose snake has been identified in the Hastings Relict Sandhills Community UEA.

Apalachicola Floater

The USFWS' aquatic resource survey documented six native and one introduced mussel species on Fort Benning (Fort Benning 2001, 2003a). Four mussels of "Conservation Concern" are listed in the INRMP: Apalachicola floater (*Anodonta heardi*), eastern elliptio (*Elliptio complanata*), little spectaclecase (*Villosa lienosa*), and southern rainbow (*Villosa vibex*). The Apalachicola floater is a species of conservation concern in Georgia, and the remaining three species are identified as species of special concern only in Alabama.

In 2006, surveys for freshwater mussels were conducted at stream crossings that would be modified as part of the proposed Transformation actions. Stream crossings were sampled at Pine Knot Creek, Little Pine Knot Creek, Sally Creek (tributary), Randal Creek (and tributaries), Kendall Creek (and tributaries), Upatoi Creek (and tributaries), and Ochillee Creek. No special-status mussel species were detected.

4.13.1.4 Unique Ecological Areas (UEAs)

In accordance with DOD Instruction 4715.3, Fort Benning and several conservation partners identified UEAs that represent the best examples on Fort Benning of a particular habitat or plant community type. UEAs were chosen based on characteristics of their biotic and abiotic features and in many cases contain remnant native plant communities that have experienced minimal disturbance relative to other similar communities. As a result, such areas can serve as reference sites for the biodiversity and ecological processes associated with natural communities. Designation of UEAs is designed to ensure proactive management and long-term land-use planning and training activities that account for their presence and their preservation requirements (Pentecost 1999, Fort Benning 2001, 2003a). The management emphasis for UEAs is on communities and ecosystems, rather than individual species.

Designation of a UEA does not entail any restrictions in land use. However, since UEAs represent some of the most rare or highest quality areas on Fort Benning they receive priority for management activities and monitoring efforts, as identified in the INRMP. In some cases, no "active" management is required, although these areas are still monitored for unauthorized disturbances and surveyed for threatened and endangered species. Some UEAs receive active management in the form of timber harvest. Although no permit is required to cut trees in this area based on their status as a UEA, special consideration is given to these areas in the Installation's training compartment timber harvest plan. UEAs also receive priority for soil erosion projects, invasive species control, longleaf pine reforestation, road closures, and strict adherence to Best Management Practices.

Conservation of the UEAs is subject to consistency with the military mission and would be reassessed if the military needs of the Installation change during proposed Transformation action. Further development of the UEA concept will include a determination of the conservation significance of these areas, better-defined boundaries and buffers, and a specific management plan for each UEA.

In total, including designated buffer zones for the Piedmont Interface area, the existing UEAs encompass almost 21,400 acres and 15 separate sites. The boundaries and acreages are approximate and are refined as the areas are further studied. Each UEA was identified initially by Fort Benning staff or by USFWS, TNC, or GA Natural Heritage staff, who evaluated their condition in the field and made a preliminary determination that each area deserved consideration as an area of conservation significance. Those UEAs proximate to sites affected by the proposed activities are listed in Table 4.13-4 and described below; descriptions are based on the INRMP (Fort Benning 2001, 2003a).

Table 4.13-4: Potentially Affected Unique Ecological Area

Name	Military Training Compartments	Proposed Actions	Compatibility Issues
Longleaf Pine Loamhills	Portions of A14, A15, A16, A17	PN65070 (MPMG2), PN68733 (MPMG1)	Forest Management Operational Plans, RCW
Ochillee Creek Wetlands	Portions of C1, C2, C3, E1, E7, R2, T1, T2, T6, and T7	PN62953(Cantonment), PN65554 (Road), PN65557 (Road), PN64797	Wetlands
Piedmont Interface	All or portions of K5, K6, O4, O5, O6, O7, O8, O10, and O11	PN65557 (road), PN69742 (road), PN65554 (road), PN67457 (fence)	Relict trillium populations
Prosperity Church Oak-Hickory Forest	Portion of E5	PN69743 – Southern Training Area Infrastructure	Siting of the heavy maneuver corridor
Hastings Relict Sandhills Community	Portions of K11, K12 (minus Hastings Range), K13, K14, and K17	PN65557 (road), PN64551 (MPTR 1 Range)	Gopher tortoise, RCW, Bachman's sparrow; off-road vehicles
Pine Knot Creek Blackwaters	Portions of D1, D2, D3, K15, K17, K18, K19, K20, K21, K22, and K23	PN65557 - Road upgrade/ reinforcement	Wetlands and stream crossings; Bachman's sparrow, gopher tortoise
Arkansas Oak Rock Hills	All or portions of F4, F5, G5, G6, and H2	Adjacent to road upgrade/ reinforcement	None
Upatoi Bluffs	Portions of AA, BB1, BB2, J1, J3, J4, J5, L6, M3, M4, P1, and P2	PN65554 (road)	None
Chattahoochee Backwaters	All or portions of A14, CC2, X5, Z1, Z3, and Z4	PN69668 - Good Hope Maneuver Area	Bald eagle nest site
Hite Bowl Swamp	Portions of X1 and Y1	None	Not applicable
Lakeland Sandhills	Portions of D14 and J7	None	Not applicable
Longleaf Pine Sandhills	Portions of K8 and K13	None	Not applicable
Malone Cane Breaks	Central portion of M6	None	Not applicable
Slopes of Northern Affinities	Southern portion of K20	None	Not applicable
Upatoi Creek Flatwoods	Northern portion of K10	None	Not applicable

Longleaf Pine Loamhills UEA

The Longleaf Pine Loamhills UEA is located within the southwest portion of the Installation, is characteristic of the Longleaf Pine Loamhills Ecological Group. It represents one of the best longleaf pine stands on the Installation in regard to both quality and size. Species of conservation concern that are present include the RCW and short-leaved skeleton-grass. Part of the management strategy for this area is to include a large reference area (potentially the western portion) in which the only active management will be prescribed burning. Such a reference area can be used to track the natural progression of a longleaf stand and may be valuable in evaluating uneven-aged forestry management techniques. The rest of the area will be managed in accordance with applicable Forest Management Operational Plans for longleaf pine. Longleaf pine restoration in the Minter Hill live-fire range is part of the management for this UEA. Longleaf pine seedlings have become naturally established in the area since 2001. Future management will include prescribed burning and thinning as necessary.

The Longleaf Pine Loamhills UEA is partly overlapped by proposed Multi-Purpose Machine Gun Ranges in the southern range area, under Alternative B.

Ochillee Creek Wetlands UEA

The Ochillee Creek Wetlands UEA is located within the central portion of the Installation and generally runs between two railroad lines that bisect the Installation. This area is a high-quality forested wetland along Ochillee Creek that is characteristic of the Mesic Hardwood Forests Ecological Group. Common species that are present include loblolly pine, white oak, water oak, magnolia spp., beech, tuliptree, American holly, and swamp chestnut oak (*Quercus michauxii*). This UEA contains Fort Benning's Champion loblolly pine. Species of conservation concern include a large disjunct population of tussock sedge. The area is used by the military for dismounted training; however, training does not usually occur in the wetlands. The area is intended to be managed passively.

The Ochillee Creek Wetlands UEA is partly within the Rail Loading Facility Expansion Area and Driver Training Access Road in the Harmony Church cantonment area, and is overlapped by road construction/upgrade projects.

Piedmont Interface UEA

The Piedmont Interface UEA is located within the northeastern part of the Installation. This area is characteristic of the Stream Floodplain Ecological Group. Although this area occurs within the Fall Line transition between the Piedmont and the Coastal Plain Physiographic Regions, some of its geologic and vegetative features are not characteristic of the Fall Line Sandhills. The area contains seven streams that flow out of the Piedmont, generally from north to south, and that are characterized by extensive floodplains with high-quality hardwood stands. The area also contains the largest granite rock outcrop on Fort Benning in training compartment O7, which extends for a quarter mile along a bluff above the old Randall Creek channel. Characteristic flora of the area consists of Shumard oak (*Quercus shumardii*), white oak, cherrybark oak (*Quercus pagoda*), swamp chestnut oak , ash, loblolly pine, sweetgum,

sycamore, hickory, elm, maple, and flowering dogwood. Relict trillium occurs in at least seven separate populations in this area**.** All seven populations were confirmed present in a 2006 survey (USACE 2007a). Cox Creek in the northeast portion of the Installation contains the most diverse mussel fauna on Fort Benning, including several Alabama special concern species. Georgia protected species in the area include Sandhills bean (*Phaseolus polystachios sinuatus*), Smith's sunflower (*Helianthus smithii*), incised agrimony (cut-leaf harvest lice) (*Agrimonia incisa*), and wide-leaved bunchflower (*Melanthium latifolium*). The single greatest disturbance and threat to this area is feral swine due to their rooting style of feeding behavior.

Portions of the Piedmont Interface UEA are crossed by proposed road construction/upgrade and security fence projects.

Prosperity Church Oak-Hickory Forest UEA

The Prosperity Church Oak-Hickory UEA is located within the southeastern portion of the Installation, is the largest and best example on Fort Benning of an oak-hickory upland forest. The area is characteristic of the Dry-mesic Hardwood and Dry-mesic Mixed Hardwood / Pine Forest Ecological Group, but it is distinct from other vegetation in the group because it is found on a dry hilltop in addition to a mid-slope location. Common species that are present include white oak, cherrybark oak, rock (mountain) chestnut oak (*Quercus prinus* [= *montana*]), hickory, tuliptree, sweetgum, flowering dogwood, chalk maple, eastern red cedar (*Juniperus virginiana*), farkleberry, black cherry, and a few scattered loblolly pine and ash trees. Shrubs include American holly, hawthorn, and sassafras. Special status species include croomia and American ginseng. The surrounding area is used by the military for mechanized training. Appropriate management prescriptions, such as the use of prescribed fire, remain to be determined (Fort Benning 2001, 2003a). The area is overlapped by the proposed road construction/upgrade and Heavy Maneuver Corridor – South.

Hastings Relict Sandhills Community UEA

The Hastings Relict Sandhills Community UEA is located within the northeast part of the Installation, is characteristic of the Longleaf Pine Sandhills Ecological Group. The deep sands of this UEA are subject to erosion. Loblolly pines are scattered throughout some areas, but longleaf pine dominates the overstory vegetation. Mixed upland oaks (turkey, bluejack, and sand post oaks) and common persimmon (*Diospyros virginiana*) are co-dominants in the overstory and dominate the midstory. Common herbaceous species include common yellow false foxglove (beardgrass) (*Aureolaria pectinata*), prickly pear cactus (*Opuntia compressa*), goat's rue (*Tephrosia virginiana*), legumes, pineland silkgrass (*Heterotheca graminifolia*), and other perennials. Some portions of the area have only grasses, herbs, and small shrubs due to removal of longleaf pine and subsequent disturbance by tracked vehicles and frequent fire. The dominant soils are Lakeland sand and Troup loamy sand. Isolated clay pockets and ephemeral ponds occasionally lie close to the surface.

The deep sands of this UEA contain the densest population of gopher tortoises on the Installation. Many other special status wildlife species (see Table 4.13-3) also occur in this UEA. The dusky gopher frog is

found only in this area on Fort Benning. Other species found here include the eastern diamondback rattlesnake, eastern tiger salamander, southern hognose snake, Florida pine snake, eastern coachwhip, southeastern pocket gopher (*Geomys pinetis*), Bachman's sparrow, common ground dove (*Columbina passerina*), RCW, and incised agrimony.

Road improvements and upgrades, as well as the proposed MPTR for Alternative B would occur partly within the Hastings Relict Sandhills Community UEA.

Pine Knot Creek Blackwaters UEA

The Pine Knot Creek Blackwaters UEA is located within the east-central portion of the Installation. This area is characteristic of the Small Stream Swamps Ecological Group and represents the best example of a Coastal Plain stream on the Installation. It encompasses Pine Knot Creek and Little Pine Knot Creek. Unique hydrologic characteristics of a Coastal Plain blackwater stream include relatively constant flow and temperature, high acidity, low sediment load, and low fish diversity. Vegetation is typical of a hardwood bottom in the Sandhills. A proposed upgrade for a tank trail crosses the Pine Knot Creek Blackwaters UEA.

Arkansas Oak Rock Hills UEA

The Arkansas Oak Rock Hills UEA is located within the southeastern corner of the Installation, is characterized by longleaf pine on steep rocky ridges that run east to west. It also contains unusual plants in addition to numerous relatively undisturbed drains of varied steepness. Characteristic flora includes longleaf and shortleaf pine, post oak, southern red oak, and blackjack oak. Species of conservation concern include bottlebrush buckeye (*Aesculus parviflora*), Arkansas oak (*Quercus arkansana*), dwarf chinkapin oak (*Quercus prinoides*), lax water-milfoil, and incised agrimony. The military uses the area primarily for dismounted training. Cut-to-length logging is used where feasible for harvesting the pine species.

Road improvements and upgrades as part of the Proposed Actions would occur adjacent to the Arkansas Oak Rock Hills UEA.

Upatoi Bluffs UEA

The Upatoi Bluffs UEA occurs within the west-central portion of the Installation along the eastern side of Upatoi Creek and consists of steep topography and the bluff forests on the east / south sides of Upatoi Creek. The bluffs are characteristic of the Mesic Hardwood Forests Ecological Group. Special status plant species (Table 4.13-2) that occur here include croomia, American ginseng, and Carolina silverbell (*Halesia tetraptera*). The area is intended to be managed passively. This area is rarely used for military training. When used for training, it is used only for foot traffic. Proposed construction of paved training roads would cross the Upatoi Bluffs UEA.

Chattahoochee Backwaters UEA

The Chattahoochee Backwaters UEA encompasses the backwaters of the Chattahoochee River, primarily within the Alabama portion of the Installation. It is a diverse mix of islands, peninsulas, sloughs, bays, and wetlands and includes riparian areas and adjacent upland hardwood / pine forests. The area is also called River Bend because of the 90-degree bend made here by the Chattahoochee River. The area contains extensive hardwoods and the largest water tupelo (*Nyssa aquatica*) forest on the Installation. River birch (*Betula nigra*), loblolly pine, red maple, sweetgum, and Spanish moss (*Tillandsia usneoides*) also are found here. The area is characteristic of the River Floodplains and Cypress / Tupelo Swamps Ecological Group. Typical fauna of the backwater area includes waterfowl, wading and water birds, and many varieties of turtles and amphibians.

Species of conservation concern found here include: one breeding pair of bald eagles, breeding osprey (*Pandion haliaetus*), wood stork feeding and roosting sites, the highest concentration on the Installation of American alligators, alligator snapping turtle, Barbour's map turtle, a wading bird rookery, Allegheny chinquapin (*Castanea pumila*), white nymph (*Trepocarpus aethusae*), and serrate crownbeard (*Verbesina aristata*).

Within the main channel of the river in this area, a number of fish species of conservation concern occur. These include the spotted bullhead (*Ameiurus serracanthus*), bluestripe shiner, and spotted gar (*Lepisosteus oculatus*).

The backwaters area is used rarely by the military. If training occurs at all, it is dismounted training. Recreational fishermen and hunters, however, heavily use the area. The hardwoods in the area are intended to be managed passively in accordance with applicable Forest Management Operational Plans. Additionally, pines will be managed to produce tall dominant trees for possible future nesting trees for the bald eagle. During the bald eagle nesting season, December 1 to June 1, certain restrictions are placed on activities that could occur around the bald eagle nest. These include flight, training, and recreational restrictions (Fort Benning 2001, 2003a). The Chattahoochee Backwaters UEA coincides with portions of the Good Hope Maneuver Area the use of which for heavy equipment training would be intensified under the Proposed Action.

4.13.2 Environmental Consequences

Impacts on biological resources would be considered significant if one of more of the following conditions would result:

- Substantial loss or degradation of habitat or ecosystem functions (natural features and processes) essential to the persistence of native plant and animal populations;
- Substantial loss or degradation of a sensitive habitat, including wetlands and UEAs that support high concentrations of special status species or migratory birds;

- Disruption of a federally listed species, its normal behavior patterns, or its habitat that substantially impedes the Installation's ability either to avoid jeopardy or conserve and recover the species; or
- Substantial loss of population or habitat for a state-protected or non-listed but special status species, increasing the likelihood of federal listing action to protect the species in the future.

The definition of "substantial" is dependent on the species and habitats in question and the regional context in which the impact would occur. Impacts may be considered more adverse if the action affects previously undisturbed habitat or if the impact would occur over a large portion of available habitat in the region. Mitigation measures are identified for adverse impacts. For mitigation for impacts to wetlands, refer Section 4.11.3.

According to information provided on the USFWS website regarding migratory birds, an activity will be determined to have a significant adverse effect when it is found within a reasonable period of time to diminish the capacity of a population of migratory bird species to sustain itself at a level that maintains its genetic diversity, to reproduce and to function effectively in its native ecosystem. This assessment of impacts takes into account yearly variations and migratory movements of the migratory bird species found on Fort Benning.

None of the Proposed Actions or alternatives would result in significant adverse effects to any migratory bird populations. For all other bird populations, the potential loss or unintentional "take", through non-military readiness activities associated with MCOE, would be minimal and would not have a significant adverse affect. Other than the Red-cockaded Woodpecker, the impacts of habitat loss due to construction, operations, maintenance, and maneuvers are also not to the level that would result in significant negative impact to migratory bird species' population. Table 4.13-5 lists SOC on Fort Benning, their PIF score, PIF priority (Extremely High (EHP), High (HP) and Moderately High (MHP)), current potential suitable acreage on Fort Benning, and positive or negative change in suitable habitat for the No Action Alternative, Alternative A and Alternative B.

Fort Benning will employ management/conservation efforts, to the greatest extent feasible, that will lessen the impacts on and, in some circumstances, benefit the affected migratory bird species. One minimization effort, if and when feasible, would be to minimize disturbance to areas during peak nesting season. The installation implements a number of management and conservation projects/efforts that benefit migratory birds, including those listed in Table 4.13-6, which may be impacted by the non-military readiness activities discussed in this EIS. For additional information and details related to MBTA compliance on the Installation, see section 12.9.4.4 of the Fort Benning INRMP.

Table 4.13-5: Effects of Habitat Loss on Fort Benning Migratory Bird Species of Concern

Species	Partners in Flight Score	Partners in Flight Species of Concern	Partners in Flight Priority	Estimated Potentially Suitable Habitat	Habitat Modification Effect on Species		
					No Action	Alternative A	Alternative B
Red-cockaded Woodpecker	32	Y	EHP	86,945	-	---	---
Painted Bunting (Eastern)	31	Y	EHP	128,392	0	-	-
Bachman's sparrow	30	Y	EHP	51,629	0	-	-
Black-throated Green Warbler	30	Y	EHP	108,259	-	-	-
Henslow's Sparrow	29	Y	EHP	44,762	0	0	0
Wood Stork	29	Y	EHP	10,388	-	-	-
American Kestrel (Southeast)	28	Y	EHP	40,854	+	+++	+++
Swainson's Warbler	28	Y	EHP	9,445	-	--	--
Swallow-tailed Kite (Southeast)	28	Y	EHP	10,279	-	-	-
Brown-headed Nuthatch	27	Y	HP	98,492	-	--	--
American Woodcock	23	Y	HP	19,142	-	--	--
Northern Parula	23	Y	HP	47,610	-	--	--
Prairie Warbler	23	Y	HP	85,918	-	-	-
Northern Bobwhite	22	Y	HP	104,428	-	-	-
Chuck-will's-widow	21	Y	MP	112,814	-	-	-
Common Ground-Dove	20	Y	MP	47,377	+	+++	+++

Note: Habitat Modification Effect on Species Codes = 0 (no effect), - (nominal negative effect), -- (moderate negative effect), --- (highly negative effect), + (nominal positive effect), +++ (highly positive effect)
Note: EHP = Extra High Priority, HP = High Priority, MP= Moderate Priority

4.13.2.1 No Action Alternative

The No Action Alternative represents the continuing implementation of BRAC/Transformation projects scheduled for 2009 through 2013, resulting in the impacts as were described in the BRAC/Transformation EIS (USACE 2007a). Those impacts include substantial losses of and disturbance to upland vegetation as well as aquatic and wetland habitats; reductions of native fish and wildlife populations; loss and/or disturbance of RCW clusters; and the removal and disturbance of habitat within UEAs. Mitigation measures described in Section 4.13.3 are based on the BRAC/Transformation EIS, and would continue to be implemented, reducing but not eliminating these significant impacts. All practices and BMPs listed in the INRMP and ESMPs would continue to be implemented.

4.13.2.2 Alternative A (preferred alternative)

This section describes the impacts of Alternative A on biological resources. For each sub-resource a determination is made of the impacts' significance and whether mitigation measures have been identified to reduce the impact. Mitigation measures are described in Section 4.13.3. Substantial changes have occurred to Alternative A since the Draft EIS was made available to the public in December 2008. Detailed discussion of the consultation process between the Army and the USFWS regarding special status species that resulted in major changes to Alternative A is presented below. Although specifically intended to reduce impacts to the RCW and to avoid the possibility of placing this species in jeopardy, direct benefits to other environmental resource categories occurred as a result of project design changes and training refinements that took place for Alternative A. These changes are presented below for Alternative A only.

Upland Vegetation

Implementation of Alternative A would involve many construction, development, and maintenance projects, resulting in clearing or other disturbance of up to 10,045 acres of upland habitat or roughly 7 percent of the total area on Fort Benning (Table 4.13-6). The construction areas used in these calculations represent a disturbance envelope, including the development footprint, as well as areas used for construction staging, foot traffic, vehicle storage, range impacts, and incidental ground disturbance. Construction in the cantonment areas would result in localized impacts within areas that are already extensively developed. Buildings and roadways would involve clearing of vegetation and substantial ground disturbance within the proposed project footprints. Generally, the direct impacts of range projects including training and heavy maneuver areas would be more severe and extensive than impacts resulting from non-range projects (e.g., buildings and roadways). The impacts in maneuver areas would be dispersed over large areas and would fragment remaining habitats and subject them to continuing incremental disturbance and edge effects. Trees left standing would still be subject to root damage from vehicular traffic, increasing their susceptibility to pathogens and potentially exacerbating regional losses of forest already associated with "loblolly decline." Of the potentially disturbed area, 6,317acres contain natural or semi-natural vegetation (non-plantation and non-altered areas) (Table 4.13-6).

Table 4.13-6: Upland Vegetation Impacted by Alternative A

Vegetation Type (Existing acreage)	Range Impacts (Acres)	Range Impacts (%)	Non-Range Impact (Acres)	Non-Range Impact (%)	Total Impacts (Acres)	Total Impact (%)
Mesic Hardwood Forest (1,136)	0.5	0	56	4.92	56	4.92
Dry-Mesic Hardwood and Dry-Mesic Mixed Hardwood/Pine Forest (15,283)	72	0.47	1,440	9.42	1.512	9.89
Longleaf Pine Loamhills (17,367)	0	0	1,019	5.87	1,019	5.87
Longleaf Pine Sandhills (67,373)	308	0.46	2,514	3.73	2,823	4.19
Plantations (19,881)	120	0.65	1,541	7.48	1,675	8.13
Other Altered Areas (20,603)	133	0.6	1,933	9.72	2,053	10.32
Successional Uplands (10,353)	34	0.33	873	8.43	907	8.76
Total Impacts on All Vegetation Types						
Total (151,997)	**668**	**0.44**	**9,376**	**6.13**	**10,045**	**6.57**

A majority of the impact would involve the disturbance or conversion of forested areas to range sites or developed areas. The amount of impacted vegetation, excluding altered areas and plantations, through time is illustrated in Table 4.13-7.

Table 4.13-7: Yearly Acres of Upland Vegetation Affected by Alternative A*

Project Year	Vegetation Affected (Acres)
2009	5,791
2010	395
2011	0
2012	131

Note: *Data does not include Plantations or Other Altered Areas

Tree removal within 25 ft of state waters (Section 4.11, Water Resources) would require a Stream Buffer Variance. Of the removed vegetation, merchantable timber would be sold via a timber sale contract controlled by Fort Benning's Land Management Branch. Any remaining non-commercial vegetative debris would be cleared and disposed under a separate slash removal contract in accordance with all applicable federal, state, and local rules and regulations.

Training in the proposed ranges and heavy maneuver areas would result in potential effects to vegetation due to vehicular traffic and clearing to maintain line-of-sight requirements. The loss of the existing native vegetation during the construction, operation, and maintenance of the proposed projects would result in a change in both species composition and abundance. Plant species that typically thrive in the forested area, for example, would diminish and species that thrive in more open areas would flourish. Invasive weeds would also increase in the affected areas. Construction projects would primarily be developed in or near existing cantonment areas. Ranges, heavy maneuver areas, roads, and the driver training course would be dispersed across the Installation, contributing to habitat fragmentation. Edge effects may encroach into adjacent habitats and isolate large tracts of undisturbed land. As noted previously, root damage from vehicular traffic would be likely to increase susceptibility to disease and add to the regional die-offs of pines, especially loblolly.

Construction-related disturbance and loss of ground cover would increase soil erosion. Soils at Fort Benning are typically sandy, with a high potential for erosion during rainfall (see Section 4.12, Geology and Soils). Maintenance of targets, roads, trails, and vehicles would also occur, resulting in more potential ground disturbance and POL spills. In addition, vehicular travel to and range usage will result in the disturbance to soil on the side of either paved or unpaved roads, resulting in potential fugitive dust emissions (discussed in more detail in Section 4.9, Air Quality).

The Proposed Actions may affect the fire regime, depending on the type and nature of the proposed activity. Ranges and associated surface danger zones (SDZs) would likely experience more frequent fires due to the discharge of additional ordnance and an increased operational tempo. Wildfires in these areas are usually allowed to burn due to safety concerns. Under a more rapid fire interval, the intensity of each fire is expected be lower due to smaller fuel load. Increases in the fire frequency would affect the plant community, favoring fire-tolerant species (longleaf pine communities) over oak-hickory and hardwood communities (Fort Benning 2001, 2003a).

Conversely, the fire frequency near buildings, roads, cantonment areas, and facility compounds may decrease due to a decrease in vegetative cover and additional fire-protection strategies that would be employed to protect property and additional personnel. Under either Alternative A or B, controlled burns and wildfires would be contained at smaller sizes because of the additional roadways and facilities distributed throughout the Installation although to a much reduced areal extent for Alternative A. Within the proposed heavy maneuver areas and drivers training course, prescribed burns would be more difficult to schedule and execute due to increased training usage. A decreased fire frequency would favor oaks, hickories, and other encroaching hardwoods.

Alternative A would result in significant adverse effects to vegetation. A substantial amount of native habitat would be lost, and disruption of ecosystem function in the disturbed areas would occur. Conversion to roads and buildings would remove vegetation entirely and range projects may affect the ecological fire regime. The impacted acreage would be distributed over the Installation rather than isolated in a single large impact zone. Stands of natural vegetation would become more fragmented and subject to edge effects due foot and vehicle traffic, runoff/erosion, and non-native plant species invading

from adjacent disturbed sites. Ecological processes such as nutrient cycling and succession would also be impacted by soil disturbance and limitations on seed dispersal and colonization between more isolated patches of habitat. Non-range projects would impact approximately 6 percent of the existing vegetative communities at Fort Benning. Range projects would impact a smaller area, covering 0.44 percent of the existing vegetative communities. Reductions of local community diversity are anticipated within forest groups based on the magnitude of losses (Table 4.13-6).

Mitigation measures listed in Section 4.13.3 would help minimize the effects of this alternative; however, the significant effects to vegetation would still remain. Permanent large-scale loss of vegetation and habitat fragmentation across the Installation are not amenable to mitigation measures and would represent a substantial loss or degradation of habitat.

Fish and Wildlife

Under Alternative A, adverse impacts would result from the construction and subsequent use of the new facilities and infrastructure within the identified footprints of ranges, construction projects, driver training areas, and heavy maneuver areas. Although exact facility placement and construction area requirements have not been determined, each site footprint is large enough to accommodate the facilities and all the necessary work areas, including construction staging and materials stockpiling that would be required. Standard BMPs would control erosion and sedimentation, limiting the potential for offsite effects and degradation of surrounding habitat. However, within the identified footprints, the loss or severe degradation of existing fish and wildlife habitats is likely and is assumed for this analysis. Furthermore, indirect effects of the Alternative would affect populations of fish and wildlife in surrounding habitat beyond the footprints.

As discussed previously, Alternative A would result in the loss or degradation of 788 acres of aquatic habitats and 114 acres of previously delineated wetland habitats, most of which occur adjacent to water bodies (Tables 4.11-10 and 4.11-11). Populations of fish and other aquatic wildlife in streams would experience degradation of their habitats at stream crossings, and generally where new training and ground disturbance result in land clearing and erosion in watershed areas, especially in wetland habitats that are in close proximity to streams. In addition to increasing sedimentation and turbidity, land disturbance and the removal of vegetation along streams could result in some stream segments becoming inhospitable to native aquatic species, thereby interfering with dispersal and utilization of up- or downstream areas that are not otherwise affected. Native fish species could be affected by construction projects that impact freshwater aquatic habitats. Construction impacts may include sedimentation, channelization, erosion, and reduction in water quality. Indirect impacts, such as invasive species and alterations of the fire regime may also have an effect on aquatic habitats.

Mitigation measures described in Section 4.11.3 would reduce the loss and degradation of aquatic and wetland habitats and the resulting effects on fishes and other aquatic wildlife. In addition, with continued protection and management of these habitats and monitoring of aquatic species in accordance with the

INRMP, it is expected that in the long term populations of native fishes and other aquatic species on the Installation would persist, although they would likely be diminished.

Construction activities associated with Alternative A would displace upland wildlife from suitable habitat in the immediate vicinity of the construction footprints in the short term. Displacement would occur due to soil disturbance, removal of vegetation, vehicle traffic, range impacts, and incidental human activity. Noise and activity during construction would result in disturbance to wildlife primarily within the site footprints, but habitat fragmentation and edge effects would extend into adjacent habitat. Alternative A is expected to be detrimental to wildlife species that inhabit forest and woodland areas, but may to some degree benefit species of more open grassland or ruderal settings, as well as forest and woodland species that are able to utilize edge habitats.

Reptiles and amphibians that occur in the affected areas would be especially vulnerable to mortality and displacement during construction and use of the areas. Animals that are displaced or flee would be vulnerable to vehicle traffic while searching for new territory. Unless suitable habitat is nearby, the displaced individuals are unlikely to survive.

Although a relatively small area of the available habitat would be directly affected, additional areas would experience more diffuse impacts by a larger number of Installation personnel. The total acreage of wildlife habitat subject to removal and disturbance would be substantial and expected to result in reduced wildlife populations, particularly among interior forest and woodland species. Some species are likely to disappear from local habitat patches that become too small, disturbed, or isolated to sustain them.

With the increase in noise and activity there would be a corresponding increase in potential disturbance to wildlife. As described in Section 4.8, Noise, ambient and impulse noise levels would increase over some areas of the Installation and in adjoining off-Post areas to the north and northeast. Increased activity within already disturbed areas (i.e. developed areas, ranges, training areas, and established roads) would not significantly affect biological resources given the ongoing activity to which they are exposed. An increase in noise around existing firing points and within impact areas is not expected to significantly affect wildlife already subject to similar impacts within those areas.

New sources of noise and activity would be concentrated and most intense within the footprints of removed and degraded habitats described above. Hence the impact on wildlife populations is largely accounted for by the affected acreage. The extent to which noise originating from distant sources would impact wildlife through startle responses, interference with communication, and short- to long-term hearing impairment, in otherwise unaltered habitat areas is difficult to estimate, but would presumably be minor due to the rapid attenuation of sound with distance from the source and the masking effect of the vegetation and topography (Larkin 1996). Wildlife that reside immediately adjacent to new sources of noise and activity to which they are unaccustomed are most likely to be affected, and could abandon those areas. In the long term, however, wildlife in the surrounding areas can be expected to coexist with military noise as long as other important habitat features are retained; no adverse long-term impacts are anticipated.

Activities will be conducted in accordance with USAIC 210-4 (Range and Terrain Regulation), guidelines and restrictions stated in the INRMP (Fort Benning 2001, 2003a), the RCW ESMP, and the Terms and Conditions of the USFWS BO on the effects of the Action on federally protected species (Appendix F). These procedures and requirements will help ensure the compatibility of training activities with the sensitive biological resources of the Installation.

Overall, Alternative A would result in potential significant effects to wildlife, fish, and aquatic species. Individuals would be directly killed by construction activity and range impacts. Plant communities and aquatic habitats would be removed and degraded. Longleaf Pine Sandhills and Loamhills habitats would be substantially altered and wildlife would be displaced from these areas. Migratory birds and waterfowl in wetlands and aquatic habitat would be similarly disturbed. Habitat fragmentation across the Installation would impair species dispersal and would reduce the amount of undisturbed habitat available to wildlife.

Special-Status Species

Plant Species

Relict Trillium (Federal Endangered)

Impacts to relict trillium have been evaluated in a separate BA submitted to the USFWS. Potential direct impacts to relict trillium include damage to the plants by timber harvesting, ground disturbance and/or project construction, as well as the loss of canopy cover. A portion of the Infrastructure Support Incr.2 project (PN67457) security fence would impact the Randall Creek North population. This will require the clearing of a 40-ft right-of-way along Chattsworth Road on the northern edge of the Installation. The proposed new asphalt administration road (PN65554), which traverses the northeastern edge of the Installation and the associated bridge over Randall Creek, would also impact the Randall Creek North population.

Affected plants may be relocated to a recipient site on Fort Benning or to a site on Georgia DNR property in order to establish or enhance off-Post relict trillium populations (USACE 2007a). Potential indirect impacts on this species could arise where weed and hog control efforts by the Installation's natural resource managers are impeded by new training requirements. The current levels of authorized hunting and additional population control by Fort Benning Conservation Branch personnel is minimally working to keep the hog population "in check" (personal communication, Thornton 2008). With management access becoming more difficult, increasing feral hog populations and damage to unfenced trillium populations could become an issue.

Increases in ground disturbance and the movement of vehicles and personnel may promote the spread of weeds into habitats that support relict trillium. Dust, such as that dispersed by vehicle traffic on dirt or gravel roads, can be detrimental to flowering plants by coating foliage and inhibiting flower pollination. Since the proposed road that will impact the Randall Creek North population will be asphalt, dust should only be a risk during project construction. This risk will be minimized by adherence to construction Best

Management Practices. Mitigation measures to reduce significant effects on relict trillium are included in Section 4.13.3.

Formal Section 7 consultation with the USFWS regarding the relict trillium and the Red-cockaded Woodpecker began on November 10, 2008. The results of this consultation are described in detail below. On February 27, 2009, the USFWS requested additional information on impacts to the Randall Creek North relict trillium population from the proposed Training Roads Project (PN65554, FY09). The Randall Creek North relict trillium population is the largest known population on Fort Benning (Fort Benning 2009a). Subsequent to this request, on March 23, 2009 the USFWS was notified by Fort Benning that approximately 0.49 acres of relict trillium habitat in the Randall Creek North area had been destroyed by personnel performing geotechnical work. This loss of relict trillium habitat is a small amount of the approximate 27 acres of relict trillium habitat in the Randall Creek North population area. In consultation with the USFWS, Fort Benning has agreed to relocate the road project from its original alignment so that only the northern-most portion (1.21 acres) of this population will be directly affected by the project (USFWS 2009). In addition to the road relocation, Fort Benning has proposed a onetime relocation of approximately 1, 281 individual relict trillium stems to minimize the direct impacts from the construction of PN65554 in the North Randall Creek area. The results of the project changes and relocation of the plant stems will be a reduction in impacts to the relict trillium but impacts to this listed species will still occur. The USFWS has concluded in its BO that the combined direct and indirect impacts of the proposed action are not likely to jeopardize the continued existence of this listed species.

For the relict trillium, the USFWS' recommended conservation measures, which are discretionary agency activities to avoid or minimize impacts to offset the direct effects of project construction, Fort Benning should:

1. Coordinate and contract the translocation of all relict trillium from the foot print of this project with the Georgia Plant Conservation Alliance (GPCA) or a GPCA affiliate.
2. Monitor the donor site for indirect effects of the action; monitor the recipient site for viability of the translocated stems.
3. Secure any recipient site fee simple purchase or permanent conservation easement.

To offset the indirect effects of project construction, Fort Benning should:

1. Complete a relict trillium management plan, indicating management actions at each known population on Fort Benning, to be coordinated through GPCA or an affiliate.
2. Construct an exclusion fence around the entire Randall Creek North population.
3. Conduct annual invasive species monitoring within the Randall Creek North population and conduct suppression of invasive species as needed.
4. Create and maintain a fire break or range road between the proposed ranges and the Randall Creek North population to prevent frequent fires.

It should be noted that the above RPMs are recommended measures by the USFWS regarding the relict trillium for Fort Benning and that each RPM does not constitute a mandatory action that must be taken by the Installation (USFWS 2009).

State-Listed Plant Species

Under Alternative A, impacts to flyr's nemesis may occur. Similar to relict trillium, direct impacts include damage to the plants by timber harvesting, ground disturbance and/or project construction. Five of the 26 occurrences of flyr's nemesis within Fort Benning may be impacted by the construction of new tank trails and road construction within the Good Hope Maneuver Area and the Scout Leader Maneuver Area. INRMP policies and practices would continue to be followed and mitigation measures for special status species identified in Section 4.13.3 would minimize adverse impacts. No significant impacts would result since the action would not jeopardize the future existence of the species or be likely to lead to federal listing.

Species not known to occur on Fort Benning include shoals spider lily, plumleaf azalea, Nevius' stonecrop, granite stonecrop, and bay star-vine (McDonald 2006). A slight possibility exists that habitats supporting previously unknown populations may be affected, but continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and mitigation measures for special status species identified in Section 4.13.3 would minimize adverse impacts. No significant impacts would result since the action would not jeopardize the future existence of the species or be likely to lead to federal listing.

No known populations of Indian olive are likely to be affected (McDonald 2006). Alternative A would result in the direct loss or disturbance of up to 660 acres, 4.3 percent of the Installation acreage, of Dry-Mesic Hardwood and Dry Mesic Mixed Hardwood/Pine Forest, the ecological group most likely to support this species. Since not all potentially affected areas have been surveyed, there is a slight possibility the actions would impact a previously unknown population, through clearing, thinning, or ground disturbance. Such an impact would not be significant, as it would not jeopardize the future existence of the species or be likely to lead to trigger federal listing. Continuing implementation of the INRMP and mitigation measures listed in Section 4.13.3 would further minimize adverse impacts and help ensure the persistence of this species on the Installation.

Six localities for lax water-milfoil are known on Fort Benning, but none would be directly impacted by Alternative A (McDonald 2006). There is some possibility, however, that previously undiscovered locations in freshwater habitats that support this species could be affected. Range-related impacts in the Arkansas Oak Rock Hills UEA may affect downstream locations supporting this species by clearing vegetation, trampling individual plants, altering surface water distribution, or degrading water clarity through turbulence and sedimentation. Impacts in this UEA would be minimal, occurring in only 0.1 percent of the designated acreage (see below). Individuals may be trampled or disturbed, but the impact would be minor and would not impact the future existence of lax water-milfoil or be likely to lead to the federal listing of the species. Therefore, the impact would not be significant. Continuing

implementation of the INRMP and mitigation measures listed in Section 4.13.3 would further minimize impacts and help ensure the persistence of this species on the Installation.

However, no known populations of sweet pitcher plant would be affected within cantonment areas (McDonald 2006). The largest populations of sweet pitcher plant on Fort Benning are found in the Malone Cane Breaks UEA, which would not be disturbed or modified by Alternative A. This species is also present in moist woodlands, seepage areas, and wetland margins in the proposed Heavy Maneuver Area – North and training compartment O14. Road crossings, vehicle traffic, and habitat modification in these areas could possibly affect habitats of this species. Proposed activity outside of the tank trails in the Heavy Maneuver Area – North would not involve construction projects, grading, or paving. A new population of sweet pitcher plants has been found in O-9 just north of project PN65383. This new population will need to be monitored and protected during construction of the range. Some additional erosion control measures may be needed. The impacts would not jeopardize the future existence of sweet pitcher plant or be likely to lead to the federal listing of the species, and therefore would not be significant. Continuing implementation of the INRMP and mitigation measures listed in Section 4.13.3 would further minimize impacts and help ensure the persistence of these species on the Installation.

No known populations of croomia would be directly affected (McDonald 2006). Croomia occupies moist habitats in the Upatoi Bluffs UEA and Prosperity Church Oak-Hickory Forest UEA. Range construction, heavy maneuver training, and the drivers training area are adjacent to the Upatoi Bluffs UEA and may indirectly affect habitat through habitat fragmentation, erosion, sedimentation, invasive species, and alterations in the fire regime. These potential impacts would not jeopardize the future existence of croomia or lead to the federal listing of the species; hence they would not be significant. Continuing implementation of the INRMP and mitigation measures listed in Section 4.13.3 would further lessen impacts and help ensure the persistence of this species on the Installation.

No known populations of Pickering's morning glory would be directly affected (McDonald 2006). The largest known concentration of Pickering's morning glory inhabits the Lakeland Sandhills UEA, adjacent to the DMPRC. No proposed projects are proposed in this UEA. Smaller population areas elsewhere on the Installation could be affected by construction projects and ranges, but the impact would not be significant because they would not jeopardize the future existence Pickering's morning glory or lead to the federal listing of the species. Continuing implementation of the INRMP and mitigation measures listed in Section 4.13.3 would further lessen impacts and help ensure the persistence of this species on the Installation.

No known populations of Georgia rockcress would be directly affected (McDonald 2006). Construction projects at the Main Post and Qualification Training Range in the southern range area are proposed near habitat occupied by Georgia rockcress. Indirect impacts may include erosion, sedimentation, and the spread of invasive plants. The stream bank ESPCP includes a buffer area along the stream bank, which would help to protect Georgia rockcress along the Chattahoochee River. In any case, Alternative A would not jeopardize the future existence of Georgia rockcress or in any case lead to substantial loss of the species, and therefore would not be significant. Continuing implementation of the INRMP and

mitigation measures listed in Section 4.13.3 would further lessen impacts and help ensure the persistence of this species on the Installation.

Other Plant Species of Conservation Concern

A small fraction of the known or potential habitat for these species would be affected by proposed Alternative A (Tables 4.13-3, 4.13-7 and 4.13-9). Known affected locations include:

- Needle palm (*Rhapidophyllum hystrix*) (1 out of 66 known locations affected);
- Sandhills bean (10 out of 55 known locations affected);
- Smith's sunflower (1 out of 3 known locations affected); and
- White four-o'clock (*Mirabilis jalapa*) (4 out of 11 known locations affected).

These species are not listed as threatened or endangered and their status is more secure than species discussed previously. Most of the known and potential habitat for these species would not be affected by the Proposed Action (Tables 4.13-7 and 4.13-9), and it is unlikely that impacts would be of sufficient magnitude to jeopardize the species or trigger listing. Therefore, significant impacts on these species would not occur. There is a small likelihood that these and other species of concern could be present in previously unsurveyed or undiscovered locations affected by Alternative A. Continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize potential short-term and long-term adverse impacts.

Animal Species

Alternative A would have no effect on federally-listed American alligator or the wood stork, due to the absence of these species from areas of potential impact (USACE 2007a) and continuing management efforts pursuant to the INRMP (Fort Benning 2001, 2003a). Alternative A would also have no effect on the bald eagle, which while no longer listed under the ESA is still protected by the Eagle Act, due to its absence from the potentially impacted areas. Following is a discussion of impacts to federally listed species.

Red-cockaded Woodpecker (RCW) (Federal Endangered)

The Biological Assessment (BA), subsequent addenda, and BO issued by the USFWS provided detailed analyses of the Proposed Action's effects on the RCW (USACE 2008b, Fort Benning 2009a, Fort Benning 2009b, USFWS 2009). The Final BA can be accessed at the following website: https://www.benning.army.mil/EMD/program/legal/index.htm. Because the following documents are voluminous, only portions of the BA Final Addendum dated March 23, 2009, BA Addendum 2 dated May 4, 2009, and the Final Biological Opinion are provided in Appendix F; the entirety of these documents can be accessed at the above-referenced website. Hard copies of these documents are also available for review at local libraries: Chattahoochee Valley Regional Library, Columbus Public Library, Fort Benning Main Post Library, Harris County Public Library, Phenix City Public Library, Richland Public Library, and South Columbus Public Library. It should be noted that the discussion for Alternative

B in the BA has not been changed with the addenda to the original BA and that the addenda only involved changes to Alternative A.

The information summarized below includes information regarding both the potential direct and indirect impacts to RCW from the proposed action, and actions taken to reduce those impacts, the Reasonable and Prudent Alternative (RPA) developed to avoid the likelihood of jeopardizing the continued existence of the RCW, and mandatory RPMs associated with the Incidental Take Statement for RCWs for Alternative A.

With specific respect to RCWs, the Army has on-going measures to avoid, reduce, or minimize the effects of the Proposed Action on its RCW population. These measures would be implemented within the boundaries of Fort Benning as well as outside the boundaries of Fort Benning. To offset the adverse effects that cannot be avoided, the Army is has proposed implementing minimization measures to provide for recovery of the RCW on lands outside of Fort Benning, including participation by willing private land owners. The primary purpose of these conservation actions is to conserve, in perpetuity lands in the vicinity of Fort Benning that have suitable or potentially suitable habitat to support the Fort Benning primary core population. The general approach would be for the Army to work in cooperation with conservation organizations and other public agencies to secure conservation easements from cooperating private land owners; restrict use of such land to avoid incompatible purposes; require affirmative maintenance, creation, and/or restoration of suitable habitat to a desired future condition. These measures are described in more detail below. The Army will continue to consult informally with the USFWS as it develops and implements off-Post conservation actions and provide an analysis of the effects of off-Post conservation actions on the long-term recovery of the RCW within one year (May 29, 2010) of completion of formal consultation on the Proposed Action.

Habitat Conservation Outside of Fort Benning

In order to provide assurances that it will accomplish the acquisition and long-term management of existing or potential habitat to benefit the survival and recovery of the RCW, the Army will, within one year of completion of formal consultation, develop an off-Post habitat conservation plan (herein "plan"). The Army will informally consult with the USFWS as it prepares a draft and final plan. The plan will include the following information, documents, procedures, and guidelines:

1. A map identifying the geographic boundaries and a list of priority parcels targeted for conservation through acquisition of a perpetual conservation easement or fee title from willing land owners.
2. A corresponding explanation of the likelihood of the acquisition of an interest in each parcel, a projected time-frame for the acquisition, the existing habitat condition, and an assessment of the contribution the parcel will make to both the short and long term recovery of the RCW.
3. A template habitat management plan describing a desired future condition for the parcel and management goals, objectives and practices necessary to achieve the desired future condition, and the projected cost estimate.

4. A template conservation easement assuring that uses of protected parcels are restricted to those compatible with RCW habitat conservation and requiring the easement holder obtain perpetual access to the property to implement a parcel-specific habitat management plan.
5. A commitment of available funding for the acquisition of conservation easement and implementation of parcel-specific management plans with an initial target of not less than nine million dollars ($9,000,000). The plan shall project the ratio of funds that will be dedicated to acquisition and long-term habitat management. This section should also include Fort Benning's commitment to the ACUB program and efforts to secure funding for it in the future.
6. Identification of a financial instrument, such as an endowment or trust, necessary to provide for the long-term RCW habitat management on protected parcels.
7. Identification of the specific entity or entities responsible for the acquisition and holding of conservation easements and the long-term management of protected parcels with copies of agreements establishing the necessary legal relationships to carry out the foregoing responsibilities.
8. All land protected under the plan shall directly or indirectly promote the survival and recovery of the RCW. The plan shall include a procedure for informally consulting with the USFWS to seek concurrence prior to initiating acquisition of an RCW-related conservation easement on a specified parcel.
9. To the maximum extent practicable, priority will be given to parcels that have the highest biological value for the conservation and recovery of Fort Benning's primary core recovery population of RCW.
10. The plan shall identify parcels of land already protected through Fort Benning's ACUB program that it seeks to include as an off-site conservation action. In order to be considered for inclusion, the Army must demonstrate that the pre-existing conservation parcel will directly or indirectly support RCW survival or recovery. A habitat management plan shall be developed and the Army must certify that the necessary instruments are in place and funding committed to assure long-term implementation of the parcel-specific plan.
11. There shall be an assessment of the effects of implementing the plan. Over the planning horizon, a projected time-line for near-term, mid-term, and long-term conservation easement acquisition and habitat management actions shall be prepared. A prediction of the likely acreage to be protected and its condition will be established. A determination will be made of the overall effect and contribution of off-Post habitat protected under the plan to recovery of Fort Benning's primary core population of RCW.

RCW cavity trees and foraging habitat would be removed or ultimately die as a result of project, road, and range construction, including staging areas and/or timber operations (Figure 4.13-5 illustrates locations of clusters found under Alternative A). The use of heavy equipment, increased traffic on infrequently used

roads, and increased human activity would increase the potential disturbance and "harassment" (as defined by USFWS) of RCWs, particularly where the activity occurs within 200 ft of RCW cavity trees during the nesting season. Construction would result in the fragmentation of forested habitats, which may limit foraging and dispersal across unsuitable habitats. Newly cleared or disturbed areas would be susceptible to weed invasion, degrading the quality of foraging and nesting habitat. The removal of pine and hardwood habitat that is not currently RCW habitat, but could be managed and restored or converted to RCW habitat, would impede the further recovery of RCW on the Installation. The loss of pine forest and areas that could be restored as such is of particular concern because of continuing regional die-offs of loblolly pine (USACE 2007a).

Operations and maintenance activities associated with Alternative A also would be likely to have adverse impacts on the RCW, through additional disturbance in SDZs associated with the new training activities, live-firing exercises that overlap foraging habitat, reduced access for RCW and other natural resource management, the encroachment of disturbance into RCW habitat, and impacts of ground disturbance on tree health (see Appendix F for more detail). Finally, the loss or "take" (as defined under the ESA) of RCW clusters would have a detrimental effect on the long-term recovery of the RCW population on Fort Benning.

In the November BA, it was determined that Alternative A would directly impact 78 RCW clusters with 12 clusters indirectly impacted. The March 2009 Final Addendum to the BA provided additional field data that was used to model the anticipated impacts on the RCW as project re-designs were being developed (Fort Benning 2009a).

The Army continued to make major project alterations after the March 2009 Final Addendum was completed to reduce impacts to RCWs associated with Alternative A. Specific projects that changed during this period included the Z2 Range (PN65036), Repair Existing Training Area Roads, Phase 1 (PN65557), 19 D/K OSUT Northern Training Area Infrastructure (PN69741), Southern Training Area Infrastructure (PN69743), and the Modified Record Fire Range (MRF7) (PN65049). Individual discussion of the reduction to these projects is presented below. As a result of these project alterations, reduced impacts occurred to seventy-one clusters in the form of habitat removal modifications, 29 clusters had no change in foraging habitat removals and 21 clusters were no longer impacted by MCOE projects.

According to the MCOE March addendum, there would have been approximately 75,798 acres of contiguous pine habitat remaining post-MCOE of that 3,903 acres in the northeastern corner could be vulnerable to isolation and not support the remaining RCW population. Following that report, aerial surveys of the K15 Dudded Impact area documented this area is connected to the remainder of the population via a forested corridor and therefore clusters and habitat in this area should contribute toward recovery of the Fort Benning RCW population. Reductions of project scopes and the cancellation of the MPMG2 (PN65070, FY11) have reduced impacts to pine habitat from 8,306 acres to 6,137 acres, increasing the amount of contiguous, manageable pine habitat remaining post-MCOE from 75,798 acres to 77,979 acres.

In the November BA, it was noted that 55 active RCW clusters will be directly "taken" as a result of harassment to the RCW by Alternative A projects since they would be within 200 ft of increased heavy maneuver training. However, upon re-evaluation in the 2nd Addendum to the Final BA, a clarification was made that only 24 of the clusters were actually within 200 ft of the maneuver impacts and that these impacts will be considered as part of the Incidental Take impacts for the MCOE actions (Fort Benning 2009b).

There were 32 "takes" authorized in the 2007 USFWS Transformational Biological Opinion. Due to project redesigns, impacts to 22 of those clusters "taken" by the Transformation projects were re-analyzed in the current BA for this EIS. Transformation projects resulting in 10 "takes" were not re-analyzed and those 10 were included in the to the total impacts for the November 2008 MCOE BA in order to assess the cumulative effects of both actions on the Fort Benning RCW population. Therefore, the total number of RCW "takes" resulting from the Transformation and MCOE actions was 88 direct "takes".

With implementation of additional project changes and the RPA noted below for Alternative A, the direct number of "takes" to the RCW from MCOE projects has been reduced to 57 direct "takes' (Fort Benning 2009b) with 24 indirect "takes." The indirect takes are broken down into 17 "takes" associated with short-term disturbances with 7 "takes" due to long-term disturbances.

Results of Formal Consultation. The USFWS notified Fort Benning in January 2009 that preliminary analyses indicated that a jeopardy determination was warranted for the RCW. Subsequently, a concerted effort was made by the Army to reduce environmental impacts of Alternative A. Project changes were developed and reductions in limits of disturbances were made and are described below. In May 2009, the USFWS Final BO stated a jeopardy opinion was warranted for impacts associated with the RCW; however, USFWS via coordination with the Army provided an RPA that, if implemented, will avoid jeopardizing the RCW and that applies to Alternative A only. The BO also provides an Incidental Take Statement for RCWs and is found in Appendix F (USFWS 2009). The RPA conditions are summarized below.

The following are Alternative A project changes and minimization efforts that were developed since the Draft EIS was released. Most of the projects involve substantial reductions in environmental impacts associated with RCWs:

Vehicle Recovery Course (PN72017, FY09). Due to the fact that this project was very early in the planning stages at the time of the initial analysis, it was projected that 100 percent of the habitat (514 acres) within the project limits would be impacted by the project activities. As planning for the project progressed, the total area that will actually be disturbed by project activities will be 192 acres. The loss of pine habitat will be reduced from 277 acres to 105 acres. Project impacts will remain the same for Cluster R01-03. However, impacts to Cluster R01-01 have been greatly reduced. This cluster had a PBG from 2004 to 2008 and contained 12 cavity trees in various stages of completion and suitability (Fort Benning 2009a). At the cluster level of analysis, this cluster will not be impacted. Cluster R01-01 is still taken at the group level analysis and not as a result of project impacts.

Blood Donor Clinic (PN64481, FY10). This project has been added to the MCOE project list and will involve the removal of approximately 5 acres of pine habitat. No RCW clusters will be impacted by this project.

Stationary Tank Range 2 (PN65383, FY09). The BA initially estimated the impacts of this project to have a limit of construction and beaten area of 488 and 1,188 acres respectively. The acreages are now 280 and 1,352 acres respectively. Even though the beaten area has increased, the reduction in the limits of construction has reduced the impacts to pine habitat from 563 acres to 527 acres.

Multi-Purpose Training Range (MPTR) (PN64551, FY09). The footprint of this project, 984 acres, access road, 9 acres, and beaten area, 1,383 acres, were expected to remove approximately 876 acres of pine habitat. As this project progressed through stages of planning and design, the project became impractical in the proposed location north of Hastings Range (Fort Benning 2009a). The Army has since re-evaluated options for the MPTR and has determined that an upgrade to the Hastings Range can accommodate this project with few environmental impacts and with the benefit of minimal loss of pine habitat for Alternative A.

Training Roads (PN65554, FY2009). In the 2008 BA, the limits of disturbance for proposed roads and trails were analyzed at 96 ft from the centerline (or 192 ft wide) in order to account for berms and erosion control measures and to provide for flexibility in design, with the exception of where limits of disturbance were constricted to avoid or minimize impacts to environmental resources. However, engineers have substantially reduced the limits for most proposed roads and trails and some road segments have been eliminated. Previous estimates were that this project would disturb approximately 890 acres with up to 580 acres of pine habitat. These acreages have been reduced to 715 acres total and 458 acres of pine habitat.

Repair Existing Training Roads (PN65557, FY10). This project consists of roads and trail upgrades throughout the Installation but outside the Maneuver Areas. The 2008 BA estimates were that this project would have impacted up to 1,194 acres of land with 721 acres of pine habitat impacted. These acreages have been reduced to 362 total and 209 acres, respectively.

Good Hope Maneuver Area (PN69668, FY09). In the 2008 BA, this entire area was analyzed as being used for off-road heavy maneuver training with the exception of some wetlands and eligible cultural resource sites. The Army has now identified 5 maneuver corridors where off-road heavy maneuver will be concentrated and the remaining pine stands should not be impacted. Pine habitat lost will be reduced from a previous estimate of 4,662 acres to 2,093 acres.

Rifle/Machine Gun Zero (Z) Range (Z2) (PN65036, FY09) and Modified Record Fire (MRF) Range 7(MRF7) (PN65049, FY09). Original estimates of impacts for these two projects were 28 acres of pine habitat impacted for the Z2 range and 80 acres of pine habitat impacted for the MRF7 range. Subsequent project changes that occurred by May 2009 reduced these impacts to 3 acres and 30 acres respectively for the Z2 range and MRF7 range. The design changes caused the Cluster O05-02 to go from being a direct foraging habitat “take” to an indirect harassment “take”.

Summary of the Jeopardy Biological Opinion. After reviewing the status of the existing population status of the RCW, the direct, indirect, and cumulative effects of the proposed action on this species, it was the USFWS' opinion that the proposed MCOE action as originally proposed was so significant as to possibly jeopardize the continued existence of this species. The effects on the species included potential direct impacts to clusters, habitat lost, habitat fragmentation, reduction in cluster density, and population recovery delay. It was the USFWS's opinion that the frequency and intensity of the training would impair the species' ability to recover its population numbers between disturbances and that the proposed action significantly contributed to the delay in the recovery of the species to a point where it put the species' ability to recover as a whole at risk.

In circumstances where the USFWS has determined that a proposed action may result in jeopardy to the continued existence to a listed species, the USFWS may provide alternative actions that can be implemented to avoid jeopardy to the listed species. Regulations in 50 CFR 402.02 implementing Section 7 of the ESA define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: 1) can be implemented in a manner consistent with the intended purpose of the action; 2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; 3) are economically and technologically feasible; and 4) would, the USFWS believes, avoid the likelihood of jeopardizing the continued existence of the listed species or resulting in the destruction or adverse modification of critical habitat.

Since the jeopardy determination was based upon the impacts to RCWs associated with direct impacts from habitat loss and indirect impacts from training expected to occur over an extended period of time, The Army and USFWS developed an RPA which addressed those impacts associated with direct habitat loss and training over time. The RPA has four mandatory components, all of which must be fully implemented to remove the determination of likelihood of jeopardy to the species by the USFWS. The four components of the RPA are as follows:

1. Remove the machine gun range in the A17 and A20 impact areas (MPMG2) (PN65070).
2. Manage 36 additional active clusters in the A20 impact area that are not currently counted toward recovery.
3. Migrate the field training aspects of the Scout Leader Course (Army Reconnaissance Course), a MCOE-related heavy mechanized training mechanized training course, from the Southern Maneuver Training Area to training areas located off the FY09 Fort Benning Installation boundary within five years from the training start date of the Scout Leader Course.
4. Rescope projects to avoid impacts.

By eliminating the expected loss of the RCWs in the MPMG2 proposed footprint, the BO noted that the likely fragmentation of the RCW population and creation of small, isolated sub-populations in that southwest area of the Installation would be eliminated. Elimination of the MPMG2 in the model simulations also resulted in Fort Benning achieving its population recovery goal earlier than with including it. Managing additional clusters in the A20 impact area will allow Fort Benning to include these

clusters toward the Installation's recovery goal and provide an offset for the direct impacts of the clusters taken by the Alternative A. Management of these clusters would occur in an area which is a stronghold for the RCW population with the best RCW habitat in the region (old trees, frequently burned). Moving the field training activities of the Scout Leaders Course will eliminate the long-term impacts from these activities in the Southern Maneuver Area resulting in reductions in both direct and indirect takes in this area. The rescoped projects to avoid/and or reduce impacts included the Southern Maneuver Area (PN69743, FY09), 19 D/K OSUT Maneuver Area (PN69741, FY2009), Northern Maneuver Area (PN69742, FY09), Repair Existing Roads (PN6557, FY10), two ranges in the Oscar Range, Z2 (PN65036, FY09) and Modified Record Fire (MRF7) (PN65049, FY09). The changes to these projects result in the avoidance of 12 RCW clusters and 1406 acres of potential RCW habitat.

The BO noted that implementation of the RPA would eliminate the long-term, chronic effects of heavy mechanized training five years after training begins. Fewer years of long term exposure would allow the 17 active clusters indirectly taken to recover and contribute to the growth of the Installation's RCW population. In the BO, the USFWS also included a mandatory Incidental Take Statement for Alternative A. The purpose of the Incidental Take Statement and its requirements are described below.

Incidental Take Statement. Section 9 of the ESA prohibits the take of endangered and threatened species without a special exemption. In the ESA, and as stated in the BO: "take" is defined as any action that would harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, kill, collect, or attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation that result in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding , feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and 7(0)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the Terms and Conditions of an Incidental Take Statement" (USFWS 2009).

The USFWS developed the following incidental take statement based upon the premise that the RPA will be carried out: 57 active clusters will be directly taken in the form destruction or degradation of habitat, 17 active clusters will be taken in the form of short-term disturbance, and 7 active clusters will be taken in the form of long-term disturbance. The combined 17 and 7 active clusters taken are also considered to be harassment takes of the project. For Alternative A, the USFWS has set two mandatory reasonable and prudent measures (RPMs) that must accompany the RPA. The RPMs are additional non-discretionary measures to minimize incidental take other than those in the project description and the RPA. The two mandatory RPMs are as follows:

1. Shift cluster centers by provisioning artificial cavities to minimize project-related cavity tree impacts or harassment impacts, primarily related to road construction and use.

2. In coordination with the USFWS, develop a monitoring plan by the end of October 2009 for RCWs affected by heavy maneuvers.

The USFWS has included ten specific Terms and Conditions associated with the minimization measures provided as part of Alternative A. These conditions refer to the monitoring plan to be developed by the end of October 2009 and that it must quantify and compare the response of RCWs to those that are exposed to maneuver disturbance to those that are not. The terms include an environmental training awareness program to include contractors and other entities working at Fort Benning to confirm and document their awareness of information regarding conservation of listed species at the Installation. The Terms and Conditions require monthly reporting of post-foraging habitat analysis to the USFWS and project and management status. A Habitat Assessment Plan is required to be completed by July 2009 in coordination with and upon approval of the USFWS. The Terms and Conditions require that the Installation notify the USFWS within 24 hours of any incidences of non-compliance with training restrictions particularly where listed species are involved. Monthly reports for the small arms ranges are required after construction of the berms to protect RCWs and their habitat. These reports will be weekly during breeding season and within 24 hours if Fort Benning discovers munitions damage in RCW clusters and/or foraging habitat from firing on any small arms ranges. Also, within six months of completion of consultation, the Installation will collaborate with the USFWS to develop a wildfire plan specific to the A20 impact area and the clusters counted toward recovery.

With the implementation of the BA, as well as the RPA, RPMs, and Terms and Conditions contained in the BO, the USFWS concluded that the anticipated level of take associated with Alternative A is not likely to result in jeopardy to the RCW.

In summary, since the Draft EIS was made available to the public, major changes have occurred to Alternative A due to the potential significant and adverse impacts to the RCW. These changes have resulted in the USFWS determination that Alternative A will not likely jeopardize the RCW. Impacts of Alternative A would still be significant because of the magnitude of the impact and its delays with long-term goals to recover the species on Fort Benning. The changes that have occurred as a result in the major project changes for Alternative A have substantially reduced those impacts to the RCW and most other resource categories when compared to Alternative B.

State-Listed Animal Species

State-listed animal species not known to occur in any of the areas affected by Alternative A include Barbour's map turtle, alligator snapping turtle, bluestripe shiner, and the southern hognose snake (refer to Table 4.13-3). Given the relatively limited acreage of aquatic habitats affected (about 3 percent) relative to their extent on the Installation as a whole, significant impacts on populations of Barbour's map turtle, alligator snapping turtle would not occur. Additionally, Alternative A does not impact the portion of the Hastings Relict Sandhills Community UEA where the southern hognose snake has been sited. The possibility exists that previously unknown locations of these species may be affected, but continuing

adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize adverse impacts.

Two state-listed species reside in areas of impact and would be adversely affected by Alternative A: gopher tortoise (State Threatened) and Bachman's sparrow (State Rare). Table 4.13-8 describes the overlap of known occurrences of these species by Alternative A activities. The percentage of locations impacted indicates the relative magnitude of the impact on populations of both species.

The gopher tortoise and its habitat on Fort Benning are monitored and protected because it is a keystone species (i.e., a species that plays an important role in its ecosystem and if it were removed or greatly decrease would cause a disproportionate impact to that ecosystem) with numerous vertebrate and invertebrate species utilizing the burrow (Fort Benning 2001, 2003a). There are 3,314 known active burrows on the Installation, of which an estimated 30 percent would potentially be impacted by Alternative A (Fort Benning 2006g). The potential impacts would be spread out over several years. Because of the magnitude of the impact and the potential for future listing action by USFWS, it is considered significant. Continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and mitigation measures for gopher tortoise and other special status species identified in Section 4.13.3 would reduce the impact on this species but the magnitude of the impact would remain significant.

Impacts to Bachman's sparrow would occur predominately in the range project areas north of U.S. Highway 27/280. The majority of the detections occur in ongoing projects in the Heavy Maneuver Area – North and Heavy Maneuver Corridor – South. An estimated 5 percent (14 of 272) of post-wide detection records occur in areas that could be impacted by Alternative A (Fort Benning 2006g). To some degree, Bachman's sparrow may be able to utilize open habitats that are created along the edges of forests and woodlands by proposed activities. The species is widely distributed, and the impact would not be likely to jeopardize its existence on Fort Benning or trigger the need for federal listing. As a result, the impact is not considered significant.

Table 4.13-8: State-Listed Species Impacted by Alternative A

Species	Ecological Group	Percent of Area Impacted	Number of Occurrences Impacted by Range Projects	Number of Occurrences Impacted by Non-Range Projects	% Total Detections in Impacted Areas
Gopher tortoise	Mesic Hardwood Forest	4.92%	0	1	9% (289 of 3314)
	Dry-Mesic Hardwood and Dry-Mesic Mixed Hardwood/Pine Forest	9.89%	0	9	
	Longleaf Pine Loamhills	5.87%	0	32	
	Longleaf Pine Sandhills	4.19%	0	96	
	Plantations	10.32%	0	23	

Table 4.13-8: State-Listed Species Impacted by Alternative A

Species	Ecological Group	Percent of Area Impacted	Number of Occurrences Impacted by Range Projects	Number of Occurrences Impacted by Non-Range Projects	% Total Detections in Impacted Areas
(Occurrence = active burrow)	Other Altered Areas	8.13%	0	124	
	Successional upland deciduous or mixed	8.76%	0	1	
	Small stream swamps and wooded seepage	2.00%	0	3	
Bachman's sparrow *(Occurrence = singing male)*	Longleaf Pine Loamhills	5.87%	0	2	5% (14 of 272)
	Longleaf Pine Sandhills	4.19%	0	7	
	Plantations	10.32%	0	3	
	Other Altered Areas	8.13%	1	1	
	Small stream swamps and wooded seepage bogs	2.00%	0	0	

Other Animal Species of Conservation Concern

A small fraction of the known or potential habitat for these species would be affected by Alternative A (Tables 4.13-3, 4.13-6 and 4.11-10). Known affected locations include:

- Eastern coachwhip snake (15 out of 92 known locations affected);
- Florida pine snake (5 out of 38 known locations affected);
- Migrant loggerhead shrike (*Lanius ludovicianus*) (3 out of 7 known locations affected); and
- American kestrel (*Falco sparverius*) (5 out of 25 known locations affected).

These species are not listed as threatened or endangered and their status is more secure than species discussed previously. Most of the known and potential habitat for these species would not be affected by Alternative A, and it is unlikely that impacts in any case would be of sufficient magnitude to jeopardize the species or trigger listing. Therefore, significant impacts on these species would not occur. There is a small likelihood that these and other species of concern could be present in previously unsurveyed or undiscovered locations affected by Alternative A. Continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize potential impacts.

There is suitable habitat for the Brazilian free-tailed bat and it could occur within the project area. The nature of impacts would primarily involve loss of roosting canopy, range impacts, vehicle traffic, and blockage or disturbance of subterranean roosting locations. The eastern woodrat (*Neotoma floridana*) and southern Appalachian woodrat (*Neotoma magister*) may occur in the project area. Habitat preferences

include many vegetation types, and could therefore be found in several of the project areas. These species may be affected by loss of suitable vegetation for nesting and fire suppression. Impacts would be minor and the disturbance to stream floodplains, hollow snags/trees, and caves would not substantially degrade mammal species at a population level across the Installation.

Dusky gopher frog habitat in the Hastings Relict Sandhills Community UEA would be impacted by range road crossings. The Heavy Maneuver Corridor – South would also overlap potential habitat for this species. The nature of the impacts would primarily involve vehicle traffic and range impacts. Small areas of construction would require ground disturbance, soil excavation, and clearing of vegetation. Because of the isolation, small size, and limited distribution of the Fort Benning dusky gopher frog population, the species is sensitive to local disturbances and fragmentation.

Construction vehicles, excavation activities, and incidental rage activities may kill individual frogs. Small patches of habitat within the range areas and heavy maneuver areas would be permanently disturbed. Tracked vehicles can crush burrows used by dusky gopher frogs and gopher tortoises. The impacts would be dispersed throughout the training areas, while the larger regional habitat would remain intact. The population of dusky gopher frogs appears to be tolerant of ongoing range training at K15 and Hastings Range (Fort Benning 2001, 2003a) and the impacts of Alternative A would be similar, although the operational tempo would increase. The impact would not be likely to jeopardize the future existence of this species on Fort Benning or lead to the federal listing of the species; however, the impacts could substantially degrade the only available habitat for the dusky gopher frog population on the Installation.

Proposed activities would impact longleaf pine sandhills, streams, floodplains and wetland areas that may be inhabited by other amphibian species of special concern, including the Apalachicola dusky salamander (*Desmognathus apalachicolae*) and three-lined salamander (*Eurycea guttolineata*). Individuals may be killed directly by construction and range activities, or breeding areas may be disturbed. The species are widespread and the impact would not be likely to jeopardize the future existence of these species on Fort Benning or lead to the federal listing of these species.

Stream crossings that would be affected by Alternative A were surveyed in 2006 (Abbott 2006). No special-status mussel species were detected. The overall impacts to freshwater mussels would not be significant. The ESPCP, NPDES permit, and Section 404 Permits will include measures to minimize impacts to aquatic habitats and wetlands. No federally protected species or state-protected species are known in the affected area.

Impacts on species of conservation concern are unlikely to be significant because substantial areas of habitat subject to a limited level of disturbance would remain. Species populations likely would be reduced, but not to levels that would cause the extirpation of the species or trigger the need for federal protection.

Unique Ecological Areas (UEAs)

Implementation of Alternative A would involve some construction, development, operational, and maintenance projects in and adjacent to UEAs. Table 4.13-9 provides the area of direct impact in each

UEA. The impact areas used in these calculations represent a disturbance envelope, including the development footprint, as well as areas used for construction staging, foot traffic, vehicle storage, and incidental ground disturbance. The boundaries and acreages of UEAs are approximate and are refined as the areas are further studied. The majority of the area within the disturbance envelope would be used for range projects, heavy maneuver areas, and the drivers training area. Range projects would involve large areas for ordnance impact and small construction sites for firing lines and associated facilities. Some site clearing and soil excavation would be conducted. Overstory trees would be cleared for line-of-sight requirements. Maneuver areas and the driver training area would be disturbed due to tracked vehicle traffic.

Approximately 217 acres of UEAs would be impacted under Alternative A. Resident species may be inadvertently killed due to logging activities and mechanized and repair/maintenance vehicle traffic through the UEAs via water crossings. Erosion occurring from traffic in the streams within the UEA and in adjacent upland areas may increase sedimentation in the UEA, lower water quality, and adversely affect habitat quality. Trees that are felled and left in place to establish line-of-sight may become an obstruction and impede water flow in certain areas of the UEA. Due to the loss of the canopy, water temperature and evaporation rates will increase in creeks and streams within the UEAs. Construction impacts would involve site clearing, soil excavation, and development of urban facilities. Both of these effects would have an impact on the hydrologic cycle and degrade and reduce populations of some species, resulting overall in potential moderate adverse effects to UEAs.

As shown in Table 4.13-9, ranges and construction projects would affect varying percentages of the existing acreage of different UEAs.

Table 4.13-9: Unique Ecological Areas Impacted by Alternative A

Name (Existing Acreage)	Impacted Acres	% Impacted	Management Issues	Alternative A Actions Occurring in Each UEA
Ochillee Creek Wetlands (836)	66.4	7.9	Wetlands	PN62953 (Cantonment)
Piedmont Interface (3,240)	61.9	1.9	Relict trillium populations	PN65557 (road), PN65554 (road)
Hastings Relict Sandhills Community (2,049)	13	0.6	Gopher tortoise, RCW, Bachman's sparrow; off-road vehicles	PN65557 (road)
Prosperity Church Oak-Hickory Forest (192)	4.1	2.1	Siting of roadways	PN69743 – Southern Training Area Infrastructure
Pine Knot Creek Blackwaters (1,629)	12	0.8	Wetlands and stream crossings, Bachman's sparrow, gopher tortoise	PN65557 - Road upgrade/ reinforcement
Arkansas Oak Rock Hills (3,823)	0	0	None.	Adjacent to road upgrade/ reinforcement
Upatoi Bluffs (1,227)	5.3	0.4	None.	PN65554 (road)
Chattahoochee Backwaters (3,983)	53.9	1.3	Bald eagle nest.	PN69668
Hite Bowl Swamp (276)	0	0	Not applicable.	None
Lakeland Sandhills (128)	0	0	Not applicable.	None
Longleaf Pine Sandhills (169)	0	0	Not applicable.	None
Malone Cane Brakes (2,132)	0	0	Not applicable.	None
Slopes of Northern Affinities (655)	0	0	Not applicable.	None

The Prosperity Church Oak-Hickory Forest UEA disturbance consists of road upgrades and off-road vehicle impacts. UEAs adjacent to range projects or within SDZ arcs may be affected by changes in the fire regime, vehicle access, and/or sedimentation and erosion that would occur due to the Proposed Actions.

With the exception of the Prosperity Church Oak-Hickory Forest UEA, Alternative A would not substantially diminish or degrade UEAs. Approximately 4 acres of the Prosperity Church Oak-Hickory Forest UEA would be significantly impacted indirectly through erosion, the spread of weeds, and increased fire frequency. This indirect effect could degrade the oak-hickory forest in adjoining areas. Mitigation measures in Section 4.13.3 would further reduce the impact.

In summary, for the following resources categories: Vegetation, Fish, Wildlife, and other Animal Species, Alternative A will have the same potential for significant impacts as the No Action Alternative. Similar to the No Action Alternative, Alternative A will have significant impacts to Special Status Species. Additionally, Alternative A will result in 57 direct "takes" of RCWs and the indirect "take' of 24 clusters of RCWs due to harassment.

4.13.2.3 Alternative B

This section describes the impacts of Alternative B on biological resources. Since the type of impacts are similar in most respects to those described in Section 4.13.2.2 for Alternative A, the impact descriptions reference that section for more details. There are major differences to the amount of disturbances to upland vegetation, and fish and wildlife between Alternative A and B that have occurred since the Draft EIS was published due to changes in Alternative A. Project differences between Alternative A and Alternative B are that Alternative B will include two Multi-Purpose Machine Gun Ranges 1 and 2 (PN65070 and 68733) and Combat Pistol Qualifications Course (PN65079) as well as additional training areas in the Good Hope Maneuver Area (PN69741). In Alternative B, the MPTR (PN64551) will be established north of the Hastings Range rather than being an upgrade to the Hastings Range as is in Alternative A. Other differences between Alternative B and Alternative A are that the major changes that have occurred in Alternative A to reduce impacts for the Vehicle Recovery Course (PN72017) do not occur in Alternative B. Major changes that have reduced impacts in Alternative A also do not occur in the Southern Training Area Infrastructure (PN69743). Modifications that have occurred in the Modified Record Fire (MRF 7) (PN65049) and Firing Range 2 (Z2) (PN65036) also do not occur in Alternative B. For each resource a determination is made of the impacts' significance and whether mitigation measures have been identified to reduce the impact. Mitigation measures are described in Section 4.13.3. As noted above, the information in the BA included in the appendix to this EIS addresses Alternative A and B with the subsequent addenda involving project changes and specific mitigation measures for Alternative A only. Measures in the original BA do however apply to Alternative B.

Upland Vegetation

Implementation of Alternative B would involve the total land disturbance of up to 24,596 acres of upland vegetation (Table 4.13-10). Table 4.13-11 shows the impact through time. Impacts would be substantially larger than those described for Alternative A due to the amount of land disturbance associated with Alternative B. Alternative A would involve the total land disturbance of approximately 10,045 acres. This is due to the larger area of impact for the ranges and training areas that have not changed in Alternative B. The affected areas comprise mostly dry-mesic hardwoods and mixed hardwood/pine forests, altered areas, plantations, and successional forests. As with Alternative A, the impacts would be significant, and would remain so after mitigation.

Fish and Wildlife

Impacts on fish and wildlife, apart from special status species, would be significant and greater than those described for Alternative A, due to the magnitude of direct and indirect impacts on habitats that support fish and wildlife populations. The habitats of most native species would be diminished or degraded, resulting in reduced population sizes.

Table 4.13-10: Upland Vegetation Impacted by Alternative B

Vegetation Type (Existing acreage)	*Range Impacts (Acres)*	*Range Impacts (%)*	*Non-Range Impact (Acres)*	*Non-Range Impact (%)*	*Total Impacts (Acres)*	*Total Impact (%)*
Mesic Hardwood Forest (1,141)	121	10.6%	0	0.0%	121	10.6%
Dry-Mesic Hardwood and Dry-Mesic Mixed Hardwood/Pine Forest (15,274)	4,061	26.5%	24	0.2%	4,086	26.7%
Longleaf Pine Loamhills (17,365)	3,572	20.3%	21	0.1%	3,593	20.4%
Longleaf Pine Sandhills (67,372)	7,521	11.2%	287	0.4%	7,819	11.6%
Plantations (19,866)	4,326	21.8%	17	0.1%	4,343	21.9%
Other Altered Areas (21,233)	1,770	8.3%	457	2.2%	2,227	10.5%
Successional Uplands (10,352)	2,371	22.9%	37	0.4%	2,408	22.3%
Total Impacts on all Upland Vegetation						
Total (152,603)	**23,742**	**15.6%**	**853**	**0.6%**	**24,596**	**16.1%**

Table 4.13-11: Yearly Acres of Upland Vegetation Affected by Alternative B*

Project Year	Vegetation Affected (Acres)
2009	4,385
2010	12,785
2011	646
2012	210

Note: *Data does not include Plantations or Other Altered Areas

Special-Status Species

Plant Species

Relict Trillium (Federal Endangered)

Alternative B does not have the reduced impacts as a result of project changes that have occurred with Alternative A. Potential impacts to relict trillium from Alternative B would be less than significant in the long-term using measures included in the BA. While habitat in the Good Hope Maneuver Area does not support relict trillium growth and is not anticipated to be found; surveys would be conducted if these plants are identified during the Proposed Action development and appropriate consultation would be reinitiated.

State-Listed Plant Species

Impacts on state-listed plant species under Alternative B would have the potential to be greater than Alternative A due to the larger amount of land disturbance involved. Impacts may occur to flyr's nemesis from the construction of new tank trails and roads within the Good Hope Maneuver Area and Scout Leader Maneuver Area. No other listed species are known to occur in areas affected by this alternative. The possibility exists that habitats supporting previously unknown populations may be affected, but continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize significant impacts. The greater area of impact for this alternative does not include habitats or UEAs with a high potential to support listed plant species; the areas are mostly mixed forest, plantations, altered areas, and successional forest.

Other Plant Species of Conservation Concern

A small fraction of the known or potential habitat for these species would be affected by proposed Alternative B. Known affected locations include:

- Canadian frostweed (*Helianthemum canadense*) (1 out of 3 known locations affected);
- Needle palm (*Phapidophyllum hystrix*) (1 out of 66 known locations affected);
- Sandhills bean (10 out of 55 known locations affected);
- Smith's sunflower (1 out of 3 known locations affected); and

- White four-o'clock (4 out of 11 known locations affected).

These species are not listed as threatened or endangered and their status is more secure than species listed above. Most of the known and potential habitat for these species would not be affected by the Alternative B (Tables 4.13-11 and 4.11-11), and it is unlikely that impacts in any case would be of sufficient magnitude to jeopardize the species or trigger listing. Therefore, significant impacts on these species would not occur. There is a small likelihood that these and other species of concern could be present in previously unsurveyed or undiscovered locations affected by Alternative B. Continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize potential impacts.

Animal Species

Federally Listed Animal Species that Would Not Be Affected

Alternative B would have no effect on federally listed species that include the listed mussel species (purple bankclimber, shiny-rayed pocketbook, Gulf moccasinshell, and oval pigtoe), American alligator, and wood stork due to the absence of these species from areas of potential impact (USACE 2007a) and continuing management efforts pursuant to the INRMP and ESMPs (Fort Benning 2001, 2003a). As the bald eagle is not federally listed but is federally protected, continuing management protection under the ESMP for the bald eagle nest site in compartment A14, which is within one mile of the proposed Good Hope Maneuver Area, would ensure no effect on this species.

Red-cockaded Woodpecker (Federal Endangered)

RCW cavity trees and/or foraging habitat will be impacted in 124 active and 12 inactive RCW clusters as a result of 2009 to 2012 for proposed projects under Alternative B. In 2008, 122 of these clusters contained PBGs, 1 contained a solitary male, and 1 was a captured site.

FHAs were completed for 123 active clusters (project impacts to 1 active cluster were in non-contiguous habitat and an FHA was not conducted). Pre- project, 35 of the 122 analyzed active clusters did not meet the SMS and 121 clusters did not meet RS.

Fifty-eight of the 123 active RCW clusters did not meet the SMS post- project and will be directly "taken" by the Alternative B projects. Forty clusters will be taken by loss of foraging habitat only, 18 clusters will be "taken" by both loss of foraging habitat and as a result of cavity tree removals, and one additional cluster will be "taken" only as a result of cavity tree removal. One hundred and twenty-two clusters did not meet the RS post-project. None of the 11 clusters where home range follows are being conducted as a minimization effort for the DMPRC will be "taken" at any level as a result of Alternative B. Seven of the clusters which are being banded as a minimization effort for the DMPRC in order to document impacts of the range within the RCW "neighborhood" will be "taken" at the cluster level (D11-01, D11-02, D16-01, E04-01, K13-04, L03-01 and O13-01). In addition, Cluster O12-02 will be "taken" at the group level.

The 2 recruitment sites established on Fort Benning as part of the Land Exchange that were remaining post-Transformation, Cluster 014-03 will be "taken" due to harassment impacts under Alternative B. Of the 16 clusters currently being monitored solely for Transformation, 7 will be "taken" at the cluster level by Alternative B.

Impacts of Alternative B would likely be significant because of the magnitude of the impact and its interference with long-term goals to recover the species on Fort Benning, and would be higher than for Alternative A. Proposed avoidance, minimization, and conservation measures that would lessen significant effects on the RCW are detailed in the Biological Assessment (USACE 2008b). Minimization strategies for Alternative B are presented in Section 9 of the BA. It should be noted that the BO, RPA, and RPMs do not apply to Alternative B.

State-Listed Animal Species

State-listed animal species not known to occur in any of the areas affected by Alternative B, include Barbour's map turtle, alligator snapping turtle, blue stripe shiner, and southern hognose snake (Table 4.13-4). Alternative B does impact the portion of the Hastings Relict Sandhills Community UEA where the southern hognose snake has been sited. The possibility exists that previously unknown locations of these species may be affected, but continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize potential impacts.

Two state-listed species reside in areas of impact and would be adversely affected by Alternative B: gopher tortoise (State Threatened) and Bachman's sparrow (State Rare). Table 4.13-12 describes the overlap of known occurrences of these species by Alternative B activities. The percentage of locations impacted indicates the relative magnitude of the impact on populations of both species. The impact on the gopher tortoise species for Alternative B would amount to roughly 29 percent of known locations, which is greater than Alternative A at approximately 9 percent. Continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and mitigation measures for gopher tortoise and other special status species identified in Section 4.13.3 would reduce the impact on this species but it would remain significant.

Impacts to Bachman's sparrow would occur predominately in the range project areas north of U.S. Highway 27/280 and would amount to 15 percent of known locations, which is greater than Alternative A with only 5 percent. To some degree, Bachman's sparrow may be able to utilize open habitats that are created along the edges of forests and woodlands by proposed activities. The species is widely distributed, and the impact would not be likely to jeopardize its existence on Fort Benning or trigger the need for protective listing. As a result, the impact is not considered significant.

Table 4.13-12: State-Listed Species Impacted by Alternative B

Species	Ecological Group	Percent of Area Impacted	Number of Occurrences Impacted by Range Projects	Number of Occurrences Impacted by Non-Range Projects	% Total Detections in Impacted Areas
Gopher tortoise *(Occurrence = active burrow)*	Mesic Hardwood Forest	10.6	1	0	28.7 (952 of 3,314)
	Dry-Mesic Hardwood and Dry-Mesic Mixed Hardwood/Pine Forest	26.5	14	0	
	Longleaf Pine	22.3	33	0	
	Longleaf Pine	11.0	558	0	
	Plantations	21.7	107	0	
	Other Altered Areas	12.1	237	0	
	Successional Upland or deciduous mixed forest	22.4	2		
Bachman's sparrow *(Occurrence = singing male)*	Longleaf Pine Loamhills	22.3	4		14.7 (40 of 272)
	Longleaf Pine Sandhills	11.0	27	0	
	Plantations	21.7	4		
	Other Altered Areas	12.1	4		
	Small stream swamps and wooded seepage bogs	6.3	1		

Other Animal Species of Conservation Concern

A small fraction of the known or potential habitat for these species would be affected by Alternative B (Tables 4.13-3, 4.13-10 and 4.11-12). Known affected locations include:

- Coachwhip snake (15 out of 92 known locations affected);
- Florida pine snake (4 out of 38 known locations affected);
- Migrant loggerhead shrike (3 out of 7 known locations affected); and
- Southeast American kestrel (4 out of 25 known locations affected).

These species are not listed as threatened or endangered and their status is more secure than species discussed previously. Most of the known and potential habitat for these species would not be affected by the Alternative B, and it is unlikely that impacts in any case would be of sufficient magnitude to jeopardize the species or trigger listing. Therefore, adverse impacts on these species would not occur. As discussed for Alternative A, there is a small likelihood that these and other species of concern could be present in previously unsurveyed or undiscovered locations affected by Alternative B. Continuing adherence to INRMP policies and practices (Fort Benning 2001, 2003a) and general mitigation measures for special status species identified in Section 4.13.3 would minimize potential impacts to less than significant.

Unique Ecological Areas (UEAs)

Implementation of Alternative B would involve some construction, development, operational, and maintenance projects in and adjacent to UEAs. Table 4.13-13 provides the area of direct impact in each UEA. The areas used in these calculations represent a disturbance envelope, including the development footprint, as well as areas used for construction staging, foot traffic, vehicle storage, and incidental ground disturbance. The boundaries and acreages of UEAs are approximate and are refined as the areas are further studied. The majority of the area within the disturbance envelope would be used for range projects, heavy maneuver corridors, and the driver training area. Range projects would involve large areas for ordnance impact and small construction sites for firing lines and associated facilities. Some site clearing and soil excavation would be conducted. Overstory trees would be cleared for line-of-sight requirements. Maneuver areas and the driver training area would be disturbed due to tracked vehicle traffic.

Approximately 2,105 acres of UEAs would be affected by Alternative B (Table 4.13-13). This impact is considered significant because of the large area directly impacted, and the likelihood of indirect impacts on river habitats due to erosion in the watershed. In particular, the impact on the Prosperity Church Oak-Hickory Forest UEA would be significant because a relatively large portion of the UEA would be impacted directly, and indirect impacts of erosion, the spread of weeds, and increased fire frequency could substantially degrade the oak-hickory forest in adjoining areas. Mitigation measures in Section 4.13.3 would reduce the impact, but it would remain significant.

In summary, for the following resources categories: Vegetation, Aquatic Habitats, and Fish, Wildlife, and other Animal Species, Alternative B will have the same potentially significant impacts as the No Action Alternative and greater impacts than Alternative A. Similar to both the No Action Alternative, Alternative B is expected to have significant impacts on Special Status Species but higher RCW impacts. Also similar to the No Action Alternative, the Prosperity Church Oak-Hickory Forest UEA would be significantly impacted with Alternative B. Alternative B would have greater significant impacts than Alternative A on Special Status Species, RCWs, and UEAs.

Table 4.13-13: Unique Ecological Areas Impacted by Alternative B

Name (Existing Acreage)	Impacted Acres	% Impacted	Management Issues	Alternative B Actions Occurring in Each UEA
Longleaf Pine Loamhills (1,169)	654	56.0	Forest Management Operational Plans, RCW	PN65070 (MPMG2), PN68733 (MPMG1)
Ochillee Creek Wetlands (836)	94	11.0	Wetlands	PN62953 (Cantonment), PN65554 (Road), PN65557 (Road), P64797
Piedmont Interface (3,364)	74	2.3	Relict trillium populations	PN65557 (road), PN69742 (road), PN65554 (road), PN67457 (fence)
Hastings Relict Sandhills Community (2,648)	907	40.6	Gopher tortoise, RCW, Bachman's sparrow; off-road vehicles.	PN65557 (road), PN64551 (MPTR 1 Range)
Prosperity Church Oak-HickoryForest (272)	21	11.2	Siting of roadways	PN69743 – Southern Training Area Infrastructure
Pine Knot Creek Blackwaters (1,629)	12	0.8	Wetlands and stream crossings, Bachman's sparrow, gopher tortoise	PN65557 - Road upgrade/ reinforcement
Arkansas Oak Rock Hills (3,823)	0	0	None	Adjacent to road upgrade/ reinforcement
Upatoi Bluffs (2,043)	7	0.5	None	PN65554 (road)
Chattahoochee Backwaters (3,409)	285	7.1	Bald eagle nest, aquatic and wetland habitats	PN69668 - Good Hope Maneuver Area
Hite Bowl Swamp (276)	0	0	Not applicable	None
Lakeland Sandhills (128)	0	0	Not applicable	None
Longleaf Pine Sandhills (169)	0	0	Not applicable	None
Malone Cane Brakes (2,132)	0	0	Not applicable	None
Slopes of Northern Affinities (655)	0	0	Not applicable	None
Upatoi Creek Flatwoods (533)	0	0	Not applicable	None

4.13.3 Mitigation Measures

4.13.3.1 Alternative A

Mitigation measures for Alternative A are identified for each major category of biological resources discussed in Section 4.13.2. Mitigation measures specified in the BO, RPA, and RPMs only apply to Alternative A.

Vegetation

Implementation of this alternative would incorporate the following mitigation measures and management practices, thereby minimizing effects on vegetation. Mitigation measures, per Army NEPA regulations, may include avoidance, minimization, repair, rehabilitation, restoration , reduction , and/or conservation for effect. Facilities and supporting infrastructure to be constructed will be sited on previously disturbed ground to the maximum extent possible. Removal of longleaf and loblolly pine will be minimized. New developments would be clustered, rather than dispersed, to the extent practicable and consistent with other land use constraints to lessen edge effects on adjacent natural areas. Temporarily disturbed sites will be revegetated with native species wherever practicable. Wetland and stream credits may be purchased if they become available from authorized sources. Mitigation measures for water resources (Section 4.11.3) and soils (Section 4.12.3) are also identified to reduce erosion, sedimentation, and potential contaminant impacts on vegetation.

Existing plans, such as the INRMP, the use of Range and Land Analysis in conjunction with the ITAM, and monitoring will be continued to measure the long term effects of expanded training and to identify and implement impact reduction strategies. Monitoring and control measures for invasive plant species will be funded as necessary to minimize the potential spread of these species into areas adjacent to newly disturbed and developed areas.

The above mitigation measures and existing management practices would help minimize the adverse effects of this alternative due to construction; however, the potential for significant effects to vegetation would still remain as a result of operations and maintenance. Permanent loss of vegetation and habitat fragmentation across the Installation, which cannot be mitigated, would represent a substantial loss or degradation of habitat.

Fish and Wildlife

Mitigation measures cited in the preceding sections would reduce adverse impacts on fish and wildlife populations. Fort Benning would continue its long-term, proactive management of fish and wildlife species and habitats through cooperative efforts with regional partners as described in the INRMP.

Special-Status Species

Avoidance, conservation, and minimization measures identified through consultation with the USFWS will be implemented to reduce adverse effects on federally listed species. The implementation of the RPA for the RCW along with the RPM associated with the Incidental Take Statement for the RCW

emanating from the formal consultation is described in the BO (Appendix F). Mitigation measures identified in the preceding sections will also be implemented to reduce adverse impacts on all special status species.

Management for relict trillium specified in the ESMP includes non-regulatory recommended measures that would be implemented to avoid and minimize potential effects on the species:

- Prior to land disturbing activities, surveys would be conducted if they have not been within the last 3 years.
- Populations would be marked; and to the extent possible, weed control, brush/vegetation removal, digging, and driving would be prohibited within these populations.
- Timber harvest would not occur within 200 ft of known populations of relict trillium.

Additional recommended mitigation considerations for protected plant species in general would be used to reduce potential adverse impacts:

- Prior to land disturbance, vegetation surveys will be conducted for special status species in all areas not surveyed within the past 3 years, and in areas subject to clearing or construction.
- All known occurrences of Indian Olive on the Installation are flagged prior to any timber harvests. Flagged plants would be avoided during timber clearing wherever practicable.
- Project siting and design within UEAs would be configured to avoid sensitive habitat areas such as wetlands, riparian areas, hardwoods, and water tupelo.
- Ongoing monitoring and conservation programs on the Installation would be continued with special emphasis on the areas affected by Transformation.
- Mitigation measures identified in Section 4.11.3 (Water Resources) would be employed to reduce potential impacts to streambanks and wetlands, to minimize erosion, and to protect water quality, reducing the potential impacts to lax-water milfoil and Georgia rockcress.

Additional recommended mitigation measures to avoid or reduce impacts on special status species include:

- Hollow snags and dead trees should be left where possible, to increase natural roosting places for bats.
- Avoid existing caves and subterranean locations by construction activities and human disturbance to minimize disturbance to bats.
- Construction will not occur within 1/8 mile (200 meters) – or other distance deemed necessary by the Installation RCW Specialist – of an active RCW cluster during the nesting season (April through July).
- Construction and use of the proposed facilities will not impede RCW management activities in surrounding areas.
- Prior to ground disturbance in areas where gopher tortoise may occur, a qualified biologist will search for occupied burrows in areas subject to construction and will relocate tortoises to a safe

location. Where tortoises are known to occur in close proximity to construction areas, fencing or other barriers to keep the animals out of harm's way will be installed.

- Prior to vegetation clearing in support of the Proposed Actions, existing GIS data and site conditions will be reviewed by Fort Benning Natural Resource Management staff to determine the known or likely potential for special status species to occur. Areas that are potential habitat for special status species but have not been surveyed within the preceding 3 years will be surveyed. Subsequent clearing and land development will: a) minimize the loss of habitat for special status species and b) incorporate measures to minimize future losses of habitat or individuals incidental to use of the site.

Unique Ecological Areas

All required measures identified in preceding sections would reduce impacts on UEAs. Additional mitigation measures to avoid and/or minimize adverse impacts include:

- Wherever possible, construction and training activities within UEAs will be sited and designed to avoid and/or minimize impacts to sensitive resources in UEAs. Stream crossings should be limited and soil stabilization BMPs should be implemented along roadsides. Range facilities, targets, and berms should be configured to avoid and/or minimize impacts to wetland areas and sensitive vegetation within the UEAs.
- Where possible, additional acreage that includes appropriate habitat features will be incorporated into existing UEAs to offset losses caused by the Transformation actions.

4.13.3.2 Alternative B

Similar mitigation measures for Alternative B will be taken for vegetation, fish and wildlife, and special status species except for those requirements for the RCWs and relict trillium established in the BO as they only apply to Alternative A.

4.14 CULTURAL RESOURCES

Definition of Resource

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can be divided into two major categories: Prehistoric and Historic resources, and American Indian resources. Prehistoric and Historic resources include archaeological resources (prehistoric and historic) and architectural resources. American Indian resources are also known as traditional cultural properties.

Archaeological resources include any material remains of past human life or activities that are 100 years old or more and capable of providing scientific or humanistic understandings of past human behavior and cultural adaptation through the application of scientific or scholarly techniques (Archaeological Resources Protection Act of 1979, Section 3(I) 16 U.S.C. 470bb). For example, archaeological resources consist of sites, arrowheads, stone flakes, or bottles. *Architectural resources* include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance (NPS 2002). *Traditional cultural resources* can include archaeological resources, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, or traditional hunting and gathering areas that American Indians or others consider essential for the continuance of traditional cultures (NPS 1998). No traditional cultural properties have been identified on Fort Benning; therefore, this category will not be discussed further in this EIS.

Under the NHPA as amended, only cultural resources included in or eligible for inclusion on the National Register of Historic Places (NRHP), defined as 'historic properties', warrant consideration with regard to adverse impacts from a Proposed Action. Historic properties generally must be more than 50 years old to be considered for protection under the NHPA. However, under the NHPA, more recent structures, such as Cold War era military buildings, may warrant protection if they are "exceptionally significant." To be considered eligible for the NRHP, cultural resources must meet one or more criteria for inclusion on the NRHP as defined in 36 CFR 60.4. These criteria include association with an important event, association with a famous person, embodiment of the characteristics of an important period in history, or the ability to contribute to scientific research. Resources must also possess integrity (i.e., its important historic features must be present and recognizable). Historic properties may be buildings, structures, historic districts, or objects.

Several other Federal laws and regulations have been established to manage cultural resources, including the Archaeological and Historic Resources Preservation Act of 1974, the ARPA of 1979, and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990. In addition, coordination and consultation with Tribes must occur in accordance with the above laws and implementing regulations as well as the American Indian Religious Freedom Act (1978); EO 13007, *Sacred Sites*; EO 13175, *Consultation and Coordination with Indian Tribal Governments*; and the DoD requirements relating to the *Annotated American Indian and Alaska Native Policy* (1999), which emphasizes the importance of

respecting and consulting with Tribal governments on a government-to-government basis. This policy requires an assessment through consultation of the effect of proposed DoD actions that could significantly affect Tribal resources, Tribal rights, and Indian lands before decisions are made by the respective services.

Related construction activities for actions identified in this section and the following subsections would be subject to the requirements of all applicable laws, regulations, and permits that may be required for construction.

4.14.1 Affected Environment

The area of potential effect (APE), or ROI, for cultural resources includes areas throughout the Installation where the proposed projects would occur to support the Proposed Action, including construction, demolition, renovation, and improvement projects within the cantonment and training range areas (see Figures 3.2-2 through 3.2-6). It would include areas subject to direct effects from ground disturbance or building renovation as well as indirect effects to historic structures, historic districts, or archaeological sites from changes in visual setting.

4.14.1.1 Prehistoric and Historic Resources

In order to provide a regional context and to assess whether buried resources could be encountered during construction projects, the prehistory and history of the Fort Benning area along with cultural resources that are known to occur in the general area are discussed briefly in the following section.

Paleoindian Period (12,000 to 8,000 B.C.)

Humans have lived on what is now Fort Benning for thousands of years. The earliest settlers were Paleoindians who arrived between 14,000 and 11,500 years ago after the end of the last Ice Age. These earliest settlers are associated with a particular type of stone projectile point or knife manufactured into a weapon or tool, known as a Clovis point. These distinctive lanceolate-shaped, bifacially chipped tools had a unique fluted base and they have been recovered in contexts that firmly tie them to a particular lifestyle. Paleoindians lived in highly mobile, small, loose-knit bands and subsisted by gathering seasonally available foods and hunting large and small game as well as the occasional mastodon and other types of megafauna common during the Late Pleistocene. Variants of the Clovis technology developed in response to adaptations to the warming climate and the extinction of the megafauna. These late points did not have fluting at the base and exhibited prepared side hafting surfaces instead. Regional variants occurring in the Southeast are referred to as Dalton, Quad, Tallahassee, and Hardaway (Kane and Keeton 1998).

Seven Paleoindian points have been recovered from Fort Benning to date. Although no subsurface cultural deposits have been documented in association with these surface artifacts, these types of artifacts are extremely rare and are important because they can yield information regarding land use and tool material sourcing preferences. Paleoindians had a preference for sites along the Chattahoochee and its major tributaries, the Upatoi and Ochillee, within Fort Benning (Elliott *et al*. 1995).

Archaic Period (8000 to 1000 B.C.)

Gradually, the climate became warmer, evolving into the modern Holocene environment of today. The coastal plain became dominated by the oak-pine forest with later encroachment and domination of pine species (Watts 1971). In response, subsistence strategies shifted and the Archaic culture emerged. Archaic people's tool kits began to diversify to complement their way of life and emphasized a reliance on modern game species. Diagnostic stone artifacts from this period include large stemmed points (Bolen, Kirk, Big Sandy, Morrow Mountain, Guilford) as well as specialized unifacial scrapers, and knives for processing animal hides. The stone tool kit also included gravers and ground stone adzes and axes for working wood. Soapstone cooking vessels were used and traded over vast distances. Fiber-tempered pottery was developed and disseminated on a small scale (Sassaman 1983). West of the Mississippi River, earthen mounds were constructed (Saunders *et al*. 1994).

Numerous Archaic sites have been documented on Fort Benning. Archaeologists hypothesized that Archaic peoples lived in bands composed of one or more extended families and moved seasonally, exploiting a variety of terrestrial and riverine resources within a major river basin (Anderson and Hanson 1988). Within Fort Benning there is an Archaic preference for settlement along the Chattahoochee as well as within the interior along the major tributaries (Elliott *et al.* 1995).

Woodland Period (1000 B.C. to A.D. 1000)

During this time, there were changes that led to the establishment of ritual centers with increasing displays of public architecture and social stratification. Permanent villages were generally built in the floodplains of large to medium-sized rivers. Major innovations during this period include the practice of horticulture, the widespread adoption of pottery, and use of the bow and arrow. Other diagnostic features of this period are the use of subterranean storage pits, an indicator of sedentism and increased reliance on the storage of food surpluses. Diagnostic artifacts from the Woodland Period, include Yadkin projectile point and a transition from stemmed to smaller, triangular shaped projectile points, which are better adapted for use with arrows. Changes in pottery technology included the incorporation of sand or grit as a tempering agent and the use of more elaborate decorative techniques.

Mississippian Period (A.D. 1000 to 1550)

Around A.D. 1200, a large chiefdom with populous villages and vast agricultural fields stretched along the Chattahoochee River Valley and for three centuries controlled the region. Called the Mississippian Culture, this era of settlement and agricultural development lasted through the mid-1550s and resulted in several large sites along the Chattahoochee River and its associated streams. A later culture, called "Creeks" by the subsequent European settlers, was responsible for building Kasita Town, one of the largest and most prominent of these sites, located on a gentle curving bluff above the Chattahoochee River and on the land occupied by present-day Lawson AAF on Fort Benning. In 1775, noted naturalist and explorer William Bartram visited Kasita Town and made a record of its high level of sophistication and the cultural achievements of its inhabitants, who called themselves the Muskogee.

Euro-American/African Settlement Period

Settlement by individuals of European and African descent began in the later 1790s and resulted in a substantial loss of land and life to the indigenous population of American Indian inhabitants. By 1840, the majority of the American Indian inhabitants had been forcibly removed to Oklahoma via the 1836 "Creek Trail of Tears." During this time, large plantations were established south of Columbus, GA, inside the large meanders of the Chattahoochee River. African-American settlement of the Fort Benning area primarily consisted of slaves associated with plantations in the late half of the eighteenth through the mid-nineteenth century. Large plantations, such as the Woolfork Plantation along the Chattahoochee River at Fort Benning, would have included a community of several hundred slaves. After the Civil War, several African-Americans were able to purchase land in the Fort Benning area following Reconstruction and establish farmsteads. For about 80 years, this land was intensively farmed. In 1918, the land was purchased for the establishment of a temporary 50-acre tent encampment, named Camp Benning in honor of General Benning, a Confederate Army hero from the area. The U.S. War Department selected Camp Benning to serve as the new home for the U.S. Army Infantry School of Arms (later to become the U.S. Airborne Infantry School [USAIS]) upon the closing of that facility at Fort Sill, Oklahoma. In the fall of 1918, the School's commandant, Colonel Henry Eames, selected a new site 9 miles south of Columbus, on a plateau above the Chattahoochee River, for the establishment of Camp Benning.

Military History

The Cuartels under construction (circa 1925)

In June of 1919, the Army purchased a nearby plantation from its owner, Arthur Bussey, and established headquarters in the family residence, which was known as Riverside. Today, the house is the Commanding general's residence (Quarters 1). On January 9, 1922, Congress issued War Department General Order Number 1, authorizing the retention of Camp Benning as a permanent military post, and re-designating it as Fort Benning. Construction of family housing, Soldiers' quarters, a hospital, athletic fields, and mess facilities occurred during the 1920s. The former hospital (now the National Infantry Museum) and family quarters on Wold, Sigerfoos, and Austin Loop date from this era, as do the eastern-most Cuartel and Doughboy Stadium. By 1930, aviation activities had begun at Fort Benning and the Works Project Administration programs, spawned during the Great Depression, provided the impetus for construction of the first runways and hangars at Lawson AAF, the first airstrip at Fort Benning. Construction during this period was not restricted to aviation facilities, however, and included the Officer's Club in 1934, a new building for the USAIS in 1935, and the Post Chapel in 1935.

Tank training at Fort Benning circa 1942

The birth of the airborne infantry concept resulted in the performance of infantry parachute test jumps over Lawson AAF, leading to the establishment of the Parachute School in 1942. With increased demand by the war effort for combat officers, Fort Benning met the challenge with the organization and establishment of the Officer Candidate School (OCS), which operated from 1941 to 1946. When the Korean Conflict escalated, the OCS was re-opened to train junior officers. In 1967, under demands of the Vietnam Conflict, the non-commissioned OCS was established to provide squad and fire team leaders.

Also during the 1940s, wooden mobilization facilities were constructed at two new areas known as Sand Hill and Harmony Church. In 1949, a major reorganization occurred when all of the units and activities of Fort Benning were consolidated under one command, forming the U.S. Airborne Infantry Command. The 1950s at Fort Benning were characterized by activities reaffirming its permanent status. Several new units were established, including the Ranger Training Command and the U.S. Army Infantry Human Research Unit, designed to study human response to training procedures and techniques. Another new area, Kelley Hill, was added to the Installation and served as a self-sustaining entity, housing an entire infantry brigade. Housing facilities, a school, bachelor officer quarters, and Martin Army Hospital were built during this decade to improve the quality of life at Fort Benning.

The escalation of the Vietnam Conflict during the 1960s shifted the emphasis of instruction at the USAIS toward combined-arms training. With the cessation of U.S. military involvement in Vietnam, the U.S. military re-directed its organization toward an all volunteer army. At Fort Benning, the Modern Volunteer Army Program was initiated and in 1973, the 197th Infantry Brigade at Kelley Hill became the Army's first all-volunteer unit and the first combined-arms team under the Strategic Army Forces concept. Since that time, development of the Fort Benning area and the construction of new facilities to accommodate training and housing have continued. Today, Fort Benning continues to serve as the USAIS and trains many Soldiers for the needs of today's Army.

1945 training under realistic conditions with live grenades

4.14.1.2 Management

Management of cultural resources on Fort Benning is an ongoing effort and will be accomplished via compliance with applicable cultural resource laws and regulations, and the Installation's ICRMP. AR 200-1and DoD Instruction 4715.3 requires ICRMPs for all Army Installations. The ICRMP provides guidance for implementation of the Army's cultural resources management policy, as prescribed in AR 200-1, *Environment Protection and Enhancement* and is in the format of both an internal Army management plan (integrating the entirety of the cultural resources program with ongoing mission activities over a 5-year planning period) and a historic property component (an extractable portion of the plan that provides for the management and treatment of historic properties and requires external review and approval). The ICRMP allows for ready identification of potential conflicts between the Installation's mission and the cultural resources management (CRM) program, in addition to identifying the legal compliance actions necessary to maintain the availability of properties and acreage required for combat readiness. The ICRMP provides Fort Benning with a guide to assess what the Installation should be doing to ensure compliance with historic preservation laws and regulations and with the tools to measure progress towards achieving the objectives outlined in the management section of the ICRMP. A Final ICRMP for Ft. Benning was finished in April of 2008.

To further improve efficiency in the Installation's CRM program, Fort Benning has adopted the Army Alternative Procedures (AAP) for implementing the NHPA; replacing NHPA Section 106 procedures (36 CFR 800). The Historic Properties Component (HPC) of the ICRMP provides the Standard Operating Procedures (SOPs) followed by Fort Benning when assessing Proposed Actions and their potential effects on Fort Benning's historic properties. Certification of Fort Benning's HPC by the ACHP was received in April 2006 (personal communication, Hamilton 2006).

The purpose of the AAP is to expedite the review of actions that might affect historic properties and leverage the NEPA process for coordination and consultation. At Fort Benning, the NEPA process of project review begins with the proponent submitting a Fort Benning Form 144R, (see discussion in Section 2.4). All projects are reviewed by the various Program Managers, including the CRM. For those projects finding no effect to historic properties, a simple "concur" is noted, and the CRM review ends. Using Section 106 procedures, a finding of no adverse effect would still require review by the SHPOs and Tribes, as necessary. Under the HPC, however, a finding of no adverse effect requires no further review prior to the project notice to proceed, although record of the project is kept for an annual review by the relevant state SHPO and Tribes in consultation with Fort Benning. An initial finding of an adverse effect for a project can be changed to no effect or no adverse effect if redesign or other avoidance measures are taken. Should mitigation be required, consultation with the appropriate SHPO and Tribes, as needed, will be conducted through the process required by NEPA. At this stage, comment may be made formally by all stakeholders, and Fort Benning must take into account such comments prior to deciding how to proceed. It should be noted that Memoranda of Agreement between Fort Benning and other stakeholders are no longer used to document consultation and mitigation; instead the NEPA documents and the HPC steps are used. Thus, a time-consuming effort normally found under 36 CFR 800 has been streamlined,

while appropriate coordination with stakeholders occurs. Only NHPA Section 106 is covered by the AAP. Other legal requirements such as the NAGPRA, ARPA, NHPA Section 110, and other mandates are unaffected by the AAP. Fort Benning's ICRMP will address compliance with these requirements. Informal contacts between Installation Cultural Resource Managers, SHPO staff, and Tribal Representatives are maintained to assure appropriate alternatives are explored and considered early to achieve the highest level of historic preservation commensurate with mission requirements.

Status of Cultural Resource Inventories

Section 110 of the NHPA requires that all federal entities inventory their properties for cultural resources so that those resources can be effectively managed and protected. Fort Benning has completed its Section 110 requirement and the entire Installation (excluding those areas that pose a safety risk) has been surveyed as part of the Environmental Protection and Enhancement program to identity, document, and evaluate all cultural resources on the Installation. Each survey produced recommendations as to whether the cultural resources discovered were eligible, potentially eligible, or not eligible for inclusion on the NRHP. The Georgia and Alabama SHPOs have concurred with a majority of these determinations of eligibility.

Archaeological Resources. Since 1987, over 120 archaeological surveys encompassing over 170,000 acres have been completed at Fort Benning, effectively completing the Installation's NHPA Section 110 requirements. As of 2003, all of the areas of Fort Benning, except those that pose threats to human health and safety (e.g. impact/dud areas), have been inventoried for archaeological resources. These surveys have ranged in size and scope from small-scale linear surveys to large-scale, multi-year inventories. As a result of these surveys, 3,982 archaeological sites have been recorded. A majority of those sites (n=3,062) have been determined ineligible for inclusion in the NRHP. The Georgia and Alabama SHPOs have concurred with these determinations and these determinations have been included in consultation with federally recognized Tribes. The remaining 920 cultural and/or archaeological sites consist of 156 sites determined eligible for the NRHP, including Yuchi Town (1RU63) which is listed on the NRHP and is also designated as a National Historic Landmark. The remaining 764 sites have not yet been evaluated for NRHP eligibility (Fort Benning 2006l). More Phase II surveys are currently evaluating the eligibility of a further 84 sites. Unevaluated sites require the same protection as eligible sites until their eligibility can be formally determined (USACE 2007a).

Architectural Resources/Historic Districts. Fort Benning is rich in buildings, structures, and objects, and has dedicated considerable effort toward the identification, preservation, and management of these historic properties. Since 1987, four architectural surveys have been conducted of Fort Benning's cantonment and other developed areas (Main Post, Lawson AAF, Custer Road, Sand Hill, Kelley Hill, Harmony Church, and the Ammunition Storage Point). The surveys identified and evaluated four distinctive districts, combining several hundred buildings. These potential historic districts are as follows: 1) the Main Post Historic District; 2) the Lawson AAF Historic District; 3) the Parachute Jump Tower Historic District; and 4) the Ammunition Storage Area Historic District. NRHP nominations are in process. Three of the districts are considered to be eligible to the NRHP, and are treated as though they

are listed. Therefore, no changes would occur to management of these resources if they were formally nominated or listed. The fourth, the Ammunition Storage Area, is the exception because this resource falls under a program comment and requires no further compliance under NHPA.

Fort Benning has also completed a Historic District Tree Management Plan in 1995 (updated in 2003) to aid management of the landscape associated with the numerous historic structures within historic districts on the Installation. Without a carefully managed landscaping plan, the various historic districts located within the Installation would lose a major part of their defining characteristics - the landscape.

In addition to identifying and documenting historic districts, the cantonment/developed area surveys resulted in the identification of 1,782 buildings, structures, and objects. Many of the buildings, structures, and objects (n=638) are contributing resources to the three NRHP-eligible Historic Districts. An additional 21 buildings, structures, and objects are individually eligible to the NRHP, and one of those 21 buildings (Riverside or Quarters 1) is individually listed on the NRHP. A total of 28 of the 1,782 buildings, structures, and objects surveyed have been demolished in accordance with either a nationwide Programmatic Agreement or in consultation with the Georgia SHPO. The remaining 1,095 buildings, structures, and objects are ineligible to the NRHP; the Georgia SHPO concurred with these recommendations (Fort Benning 2005e). Two of the cantonment areas inventoried (Kelley Hill and Harmony Church) yielded no historic buildings, structures, or objects and Sand Hill contains only a single eligible building (Fort Benning 2006).

Cemeteries. All known historic cemeteries on Fort Benning property have been inventoried and delineated and are currently maintained by the Installation. Previously unknown historic cemeteries have recently been discovered on Fort Benning for a total of over 80 Installation-managed historic cemeteries. Cemeteries and graves are among those properties that ordinarily are not considered eligible for inclusion in the National Register unless they meet special requirements. The National Register Criteria for Evaluation include considerations by which burial places may be eligible for inclusion in the National Register. To qualify for listing under Criteria A (association with events), B (association with people), or C (design), a cemetery or grave must meet not only the basic criteria, but also the special requirements of Criteria Considerations C or D, relating to graves and cemeteries. For instance, it must have *outstanding* importance to the community, State, or nation; or the events or trends with which the burial place is associated must be *clearly* important, and the connection between the burial place and its associated context must be unmistakable (NPS 1992).

Burial places evaluated under Criterion D for the importance of the information they may impart do not have to meet the requirements for the Criteria Considerations. These sites generally have been considered as archeological sites. Under Criterion D, the common requirements are that the property has information to contribute and the information is considered important. The importance of the information to be yielded usually is determined by considering a research design or a set of questions that could be resolved by controlled investigation of the site. However, although cemeteries and other burial places may be evaluated for their potential to yield information, they also may possess great value to those who are related culturally to the people buried there. In accordance with Georgia State law, prior to any

disturbance, archival and genealogical research would be conducted to establish previous ownership and history of the properties, identify occupants of the cemetery, and identify descendants who may have an interest in the project.

If a historic cemetery cannot be avoided, then it will be examined for historic significance and integrity prior to removal. For historic Euroamerican cemeteries, final removal of remains and reburial locations, if necessary, are a real property issue. The general process that the Real Estate Division (both the Installation and USACE) follows is to determine if there is justifiable cause to move the cemetery, notify all family members through letters if they can be found or by public announcements if family members are unknown, obtain the applicable permits from the state for removal, determine how family members would like to handle the reinterment, and then assist in the reinterment. If no family members are identified or come forward then the Army will determine where the cemetery and/or remains would be relocated (43 CFR 10, AR 200-1, and personal communication, DeCarlo 2007).

American Indian Resources. An ethnographic overview study identified federally-recognized Tribes that are potentially associated with Fort Benning lands (Deaver 2000). These American Indian Tribes include: the Alabama-Coushatta Tribe of Texas, the Alabama-Quassarte Tribal Town of the Creek Nation of Oklahoma, the Chickasaw Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Kialegee Tribal Town of the Creek Nation of Oklahoma, the Muscogee (Creek) Nation of Oklahoma, the Poarch Band of Creek Indians, the Seminole Tribe of Florida, the Seminole Nation of Oklahoma, the Thlopthlocco Tribal Town, and the Keetoowah Band of Cherokee Indians of Oklahoma (Fort Benning 2006l). In addition to identifying the Tribes, the report described efforts to assess the interest of these Tribes in consulting with Fort Benning on the identification of properties of traditional religious and cultural importance; suggested types and resources sensitive to the Tribes; recommended procedures for site and resource protection; and strategies for handling inadvertent or unavoidable damage to sensitive resources. Currently, no Tribe has identified a property of traditional religious or cultural importance on Fort Benning managed lands (Fort Benning 2005e). Fort Benning has a Reinterment Comprehensive Agreement with several American Indian Tribes so that reinterment elsewhere on Post is an option for any displaced American Indian burials or related cultural items located on Fort Benning as part of the NAGPRA process (Fort Benning 2003d).

As part of the consultation process associated with the Proposed Actions, consultation meetings were held for identified Tribes on November 14, 2007 and on July 8, 2008.

4.14.2 Environmental Consequences

For cultural resources, the threshold for significant impacts includes any disturbance that cannot be mitigated and affects the integrity of a historic property (an eligible cultural resource). The threshold also applies to any cultural resource that has not yet been evaluated for its eligibility to the NRHP or disturbs a resource that has importance to a traditional group under American Indian Religious Freedom Act (AIRFA), EO 13007, and NAGPRA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment by introducing visual or audible elements that are out of character for the period the resource represents, or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts are those that may occur as a result of the completed project, such as increased vehicular or pedestrian traffic in the vicinity of the resource.

4.14.2.1 No Action Alternative

The APE has been defined as the project footprints as presented in Section 3.4, Figure 3.4-1 through Figure 3.4-6. Projects include construction of structures and renovation of existing structures in the cantonment area and construction of ranges, roads, and utilities and an increase in training areas and ranges.

Under the No Action Alternative, impacts to NRHP-listed or eligible cultural resources or unevaluated properties would not change from those assessed in the BRAC/Transformation EIS (USACE 2007a). Under the No Action Alternative, 2,011 acres within the cantonment areas and 18,020 acres within the ranges and training areas would be disturbed. For the No Action Alternative, 158 cultural resources would be affected.

4.14.2.2 Alternative A (preferred alternative)

Numerous cultural resources are located within the APE. Cultural resources found under Alternative A are presented in Tables 4.14-1 for archaeological sites and Table 4.14-2 for architectural sites and only sites determined eligible or contribute to the NRHP or those that have not been evaluated are included in these tables. Table 4.14-3 presents the historic cemeteries potentially impacted within the APE. These tables also indicate the recommended mitigation measures.

The estimated disturbance associated with Alternative A has the potential to affect an estimated 80 cultural resources. Table 4.14-4 presents the type and specific number of sites impacted, the No Action Alternative impacts are also included in this table for comparison purposes. Detailed descriptions of projects proposed for Alternative A are included in Chapter 3. Because the projects are so numerous, they are described generally here in terms of the areas affected by ground disturbing actions. Visual impacts are discussed for historic properties in this section also. More detailed information, in accordance with the HPC as part of SHPO and Tribal consultation process, is provided in a confidential appendix due to the sensitive nature of the information. An executive summary of the findings is provided in Appendix G.

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE12	Prehistoric	A11	Range Access Road-Good Hope Maneuver Area PN69358	Eligible	A	Tank Maneuvers, Road Improvements	Avoidance, Protection, Excavation
9CE2022	Historic	Main Post	Infrastructure Support, Incr. 2 PN67457	Recommended	A	Construction	Testing/Evaluation, Avoidance
9CE1521	Prehistoric	K1	Repair Existing Road Upgrade PN65557	Eligible	A,B	Road Improvement	Avoidance, Protection, Excavation
9CE1734/2463	Historic	D1	Repair Existing Road Upgrade PN65557	Eligible	B	Road Improvement	
9CE1735	Historic	D2	Repair Existing Road Upgrade PN65557	Eligible	B	Road Improvement	
9CE46	Prehistoric	K9/K11	Training Area Road Construction PN65554	Eligible	A,B	Road Improvement	
9ME472	Historic	K6	Training Area Road Construction PN65554	Eligible	A,B	Road Improvement	
9ME742	Historic	O6	Training Area Road Construction PN65554	Eligible	A,B	Road Improvement	
9ME751	Historic	O6	Training Area Road Construction PN65554	Eligible	A,B	Road Improvement	
9ME766	Historic	O6	Road Construction PN65439	Eligible	A,B	Road Improvement	
9ME893	Prehistoric	O7	Road Construction PN65439	Eligible	B	Road Improvement	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE1592	Historic	A5	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	Testing/Evaluation, Avoidance
9CE1617	Historic	K11	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	
9CE207	Prehistoric	A7	Training Area Road Construction PN65554	Recommended	B	Road Improvement	
9CE226	Prehistoric	J1	Training Area Road Construction PN65554	Recommended	A	Road Improvement	
9CE243	Prehistoric	K11	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	
9CE2516	Prehistoric	BB4	Training Area Road Construction PN65554	Recommended	B	Road Improvement	
9CE44	Historic	K21	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	
9ME1226	Historic	K4	Repair Existing Road Upgrade PN65557	Recommended	A,B	Road Improvement	
9ME125	Historic	O5	Training Area Road Construction PN65554	Recommended	A,B	Road Improvement	
9ME1260	Prehistoric	K2	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	
9ME1358	Prehistoric	O10	Training Area Road Construction PN65554	Recommended	A,B	Road Improvement	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9ME268	Historic	O9	Training Area Road Construction PN65554	Recommended	A,B	Road Improvement	Testing/Evaluation, Avoidance
9ME483	Historic	O5	Training Area Road Construction PN65554	Recommended	B	Road Improvement	
9ME486	Historic	O5	Repair Existing Road Upgrade PN65557	Recommended	A,B	Road Improvement	
9ME619	Historic	O7	Training Area Road Construction PN65554	Recommended	A,B	Road Improvement	
9ME958	Prehistoric	O2	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	
9ME986	Historic	O2	Repair Existing Road Upgrade PN65557	Recommended	B	Road Improvement	Testing/Evaluation, Avoidance
9CE232	Prehistoric	Main Post	Hospital Replacement Increment 2 PN70235	Recommended	A,B	Hospital Construction	Evaluation and Avoidance or Mitigation as needed
9CE1365	Historic	R2	Rail Loading Facility Expansion PN62953	Eligible	A,B	Rail Yard Construction	Avoidance with Barriers, or Mitigation
9ME57	Historic	O7	Fire & Movement Range 3 PN65034	Eligible	A,B	Artillery Proliferation	Protection, Excavation
9CE1036	Prehistoric	B1	Good Hope Maneuver Area PN69668	Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE1040	Historic	B1		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE1746	Historic	B3		Eligible	A,B	Tank Maneuvers, Road Improvements	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE1931	Historic	B2	Good Hope Maneuver Area PN69668	Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE1938	Historic	B2		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE1942	Historic	B2		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE573	Historic	DD2		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE578	Historic	DD1		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE594	Historic	DD1		Eligible	B	Tank Maneuvers, Road Improvements	
9CE608	Prehistoric	DD1		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE873	Prehistoric	B4		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE876	Prehistoric	B4		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE894	Prehistoric	B4		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE897	Historic	B4		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE898	Historic	B4		Eligible	B	Tank Maneuvers, Road Improvements	
9CE899	Historic	B4		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE910	Historic	B4		Eligible	A,B	Tank Maneuvers, Road Improvements	
9CE1321	Historic	CC2		Recommended	B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Excavation if Eligible
9CE1564	Historic	B6		Recommended	A,B	Tank Maneuvers, Road Improvements	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE1742	Historic	B3	Good Hope Maneuver Area PN69668	Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Excavation if Eligible
9CE1748	Prehistoric	B3		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE2002	Prehistoric	Q5		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE2004	Historic	Q6		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2027	Historic	B3		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2587	Prehistoric	Q4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2592	Prehistoric	Q4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2593	Prehistoric	Q4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2595	Historic	Q4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2600	Prehistoric	Q4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE38	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE52	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE562	Historic	DD2		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE564	Historic	DD2		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE82	Prehistoric	A20		Recommended	B	Tank Maneuvers, Road Improvements	
9CE875	Prehistoric	B4		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE879	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE880	Prehistoric	B4	Good Hope Maneuver Area PN69668	Recommended	B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Excavation if Eligible
9CE882	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE884	Prehistoric	B4		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE886	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE903	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE904	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE905	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE908	Prehistoric	B4		Recommended	B	Tank Maneuvers, Road Improvements	
9CE2420	Prehistoric	A17	Multi Purpose Machine Gun Range 1 and 2 PN68733 and PN65070	Eligible	B	Construction, Machine Gunnery	
9CE2375	Historic	A15		Recommended	B	Construction, Machine Gunnery	
9CE2403	Prehistoric	A16		Recommended	B	Construction, Machine Gunnery	
9CE2414	Prehistoric	A17		Recommended	B	Construction, Machine Gunnery	
9CE2418	Prehistoric	A17		Recommended	B	Construction, Machine Gunnery	
9CE2431	Prehistoric	A17		Recommended	B	Construction, Machine Gunnery	
9CE2447	Prehistoric	A17		Recommended	B	Construction, Machine Gunnery	
9CE2448	Prehistoric	A17		Recommended	B	Construction, Machine Gunnery	
9CE2449	Prehistoric	A17		Recommended	B	Construction, Machine Gunnery	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE2459	Prehistoric	A17	Multi Purpose Machine Gun Range 1and 2 PN68733and PN65070	Recommended	B	Construction, Machine Gunnery	Testing/Evaluation, Excavation if Eligible
9CE2113	Prehistoric	K9	Multi Purpose Training Range PN64551	Eligible	B	Construction, Machine Gunnery	Mitigation
9CE2470	Prehistoric	K12		Eligible	B	Construction, Machine Gunnery	Mitigation
9CE2478	Prehistoric	K12		Eligible	B	Construction, Machine Gunnery	Mitigation
9CE2479	Prehistoric	K12		Eligible	B	Construction, Artillery Proliferation	Mitigation
9CE1332	Prehistoric	K13		Recommended	B	Construction, Artillery Proliferation	Protection or Evaluation
9CE1335	Historic	K13		Recommended	B	Construction, Artillery Proliferation	Protection or Evaluation
9ME158	Historic	O15	Northern Heavy Maneuver Corridor PN69742	Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9ME1040	Historic	L2	Training Area Infrastructure 19 D/K OSUT PN69741	Eligible	A	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9ME1328	Historic	L1		Eligible	A	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE2506	Prehistoric	Q3		Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE527	Historic	Q2		Recommended	B	Tank Maneuvers, Road Improvements	
9CE530	Prehistoric	Q2		Recommended	A,B	Tank Maneuvers, Road Improvements	
9CE541	Prehistoric	Q2		Recommended	B	Tank Maneuvers, Road Improvements	
9CE542	Prehistoric	Q2		Recommended	B	Tank Maneuvers, Road Improvements	

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9CE544	Prehistoric	Q2	19 D/K OSUT PN69741	Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE550	Historic	Q2		Recommended	B	Tank Maneuvers, Road Improvements	
9CE554	Historic	Q2		Recommended	B	Tank Maneuvers, Road Improvements	
9ME664	Historic	L3		Recommended	A,B	Tank Maneuvers, Road Improvements	
9ME668	Historic	L3		Recommended	A	Tank Maneuvers, Road Improvements	
9ME669	Prehistoric	L3		Recommended	A	Tank Maneuvers, Road Improvements	
9CE100/114	Prehistoric	E4	Southern Training Area Infrastructure PN69743	Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE101	Historic	D6		Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE1161	Prehistoric	I1		Eligible	B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE1733	Prehistoric	F2		Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE50	Prehistoric	D10		Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE51	Prehistoric	F1		Eligible	A,B	Tank Maneuvers, Road Improvements	Avoidance with Barriers, Protection, Excavation
9CE191	Historic	E6		Recommended	B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE268	Historic	D10		Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9ME1100	Prehistoric	K3	Stationary Tank Range PN65383	Eligible	A,B	Construction, Artillery Proliferation	Protection, Excavation
9ME1291	Prehistoric	K2		Eligible	A,B	Construction, Artillery Proliferation	Protection, Excavation

Table 4.14-1: Eligible and Unevaluated Archaeological Resources within the APE

Site Number	Site Affiliation	Project Location Area Designation	Project Name	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
9ME81	Historic	K3		Eligible	A,B	Construction, Artillery Proliferation	Protection, Excavation
9ME94	Prehistoric	K3		Eligible	A,B	Construction, Artillery Proliferation	Protection, Excavation
9CE1369	Historic	R2	Vehicle Recovery Course PN72017	Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE2011	Prehistoric	Main Post	WWT Plant PN71473	Eligible	A,B	Construction	Avoidance, Excavation
9CE2008	Prehistoric			Recommended	B	Construction	Testing/Evaluation
9CE223	Prehistoric			Recommended	B	Construction	Testing/Evaluation
9ME757	Historic	O6	Training Area Road Construction PN65554	Eligible	A,B	Construction, Artillery Proliferation	Protection, Excavation
9CE1556	Historic	S1	Access Road to Good Hope Maneuver Area PN69358	Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE2565	Historic	A11		Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE657	Historic	EE2		Recommended	A,B	Tank Maneuvers, Road Improvements	Testing/Evaluation, Avoidance Using Barriers
9CE2601	Prehistoric	A11		Recommended	A,B	Tank Maneuvers, Road Improvement	Testing/Evaluation, Avoidance Using Barriers

Table 4.14-2: Eligible Architectural Resources within the APE

Building Number	Building Location	Historic District	NRHP Eligibility Status	Alternative	Potential Impact	Proposed Mitigation
21	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
65	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
66	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
216	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
217	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
218	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
219	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
220	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
221	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
222	Main Post	Main Post	Eligible	B	Renovation/Upgrade	Follow Treatment Plan
245	Main Post	N/A	Eligible	A,B	Renovation/Upgrade	Follow Treatment Plan
272	Main Post	N/A	Eligible	A,B	Renovation/Upgrade	Follow Treatment Plan
471	Main Post	N/A	Eligible	A,B	Demolition	Part of CWW privatization.
M9354	Installation Wide	N/A	Eligible	A,B	Renovation/Demolition	Follow Treatment Plan
M9385	Main Post	Main Post	Eligible	B	Renovation/Demolition	Follow Treatment Plan
M9389	Installation Wide	N/A	Eligible	A,B	Renovation/Demolition	Follow Treatment Plan

Table 4.14-3: Cemeteries within the APE

Cemetery Name	Location	Project Name	Alternative	Potential Impact	Proposed Mitigation
Culpepper	Northern Range	Southern Training Area Infrastructure PN69743	A,B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Prosperity Church	Northern Range	Southern Training Area Infrastructure PN69743	A,B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Sylvester	Northern Range	Southern Training Area Infrastructure PN69743	A,B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
McCook	Northern Range	Southern Training Area Infrastructure PN69743	B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
O'Quin	Northern Range	19 D/K OSUT PN69741	A,B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Rutland	Northern Range	19 D/K OSUT PN69741	A	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Reese	Southern Range	19 D/K OSUT PN69741	B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Moore	Northern Range	Stationary Tank Range PN65383	A,B	Artillery Proliferation	Mitigation
Unnamed	Northern Range	Road Upgrade PN65557	B	Road Improvement	Mitigation
Good Hope	Southern Range	Multi Purpose Machine Gun PN68733	B	Artillery Proliferation	Mitigation
Hewell	Southern Range	Good Hope Heavy Maneuver Area PN69668	B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Jamestown	Southern Range	Good Hope Heavy Maneuver Area PN69668	A,B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation
Orr-Osteen	Southern Range	Good Hope Heavy Maneuver Area PN69668	A,B	Tank Maneuvers, Road Improvements	Avoidance/Mitigation

Table 4.14-4: Cultural Resources Affected Under the Action and No Action Alternatives

Resource	Alternative A	Alternative B	No Action
Sites, Eligible	34	43	25
Sites, Recommended Eligible	33	76	93
Total Eligible/Recommended Sites	***67***	***119***	***118***
Architectural Resources	5	16	28
Cemeteries	8	12	12
Total Cultural Resources	**80**	**147**	**158**

Cantonment Areas

Activities proposed within the cantonment areas include construction of new barracks facilities for the projected increase in personnel, construction of new training facilities, and construction of support buildings/facilities. All of these activities will be coordinated through the CRM program at Fort Benning (applying the coordination and consultation requirements prescribed in the ICRMP) to mitigate any adverse impacts to historic properties.

Main Post. There are six proposed projects within the Main Post cantonment area. These range from new facility creation to facility upgrade and expansion. These actions would potentially affect 1 NRHP-eligible and 2 recommended eligible sites (all prehistoric; see Tables 4.14-1 and 4.14-2). Construction activities could also have an adverse effect to the district, but could be mitigated by compatible design and landscaping (see Section 4.14.3).

Sand Hill. Ten projects are planned within the Sand Hill cantonment area. These include a Trainee Barracks Complex as well as multiple classroom and dining facilities. These actions would not affect any sites eligible or recommended to the NRHP.

Harmony Church. Six actions are planned within the Harmony Church cantonment area. The actions in this area are all focused on construction and expansion of support facilities. These actions would not affect any sites eligible or recommended to the NRHP.

Ranges and Training Areas

Fourteen actions are proposed within the area north of U.S. Highway 27/280, including the Vehicle Recovery Course, firing ranges, and support facilities. These actions primarily consist of constructing entirely new ranges for expanded training capabilities in tanks, light vehicles, and small arms. Within these project areas, there are 20 eligible and 11 recommended eligible archaeological sites (see Table 4.14-1).

Three actions are proposed within the area south of U.S. Highway 27/280, including a live fire complex, firing ranges, access roads, and support facilities. Some of these activities focus on the creation of new ranges, but the majority of activities planned for the area are meant to provide support and infrastructure for pre-existing facilities. Within these project areas, there are 13 eligible and 20 recommended eligible archaeological sites (see Table 4.14-1).

Six historic cemeteries are present within the areas of the Northern Range and eight historic cemeteries are present within the areas of the Southern Range subject to the projects under Alternative A (see Table 4.14-3).

Under Alternative A, the areas that would be affected by ground-disturbing activities are substantial and the affect on cultural resources by this alternative would be significant. With mitigation measures as discussed in section 4.14.3, the affect would be reduced to nonsignificant levels.

4.14.2.3 Alternative B

There are several project differences between Alternative B Alternative A. There would be two Multi-Purpose Machine Gun Ranges (MPMG-1 and MPMG-2) and an additional Automatic Combat Pistol Qualifications Course. In terms of training assets, 19D/K OSUT would take place in Q1, Q2, Q3, and Q5 with dismounted training; L1, L2, and L3 would then support light infantry training (as opposed to heavy) under Alternative A. In Alternative B, the MPTR is not included as an upgrade to the Hastings Range as is in Alternative A. Other differences between Alternative B and Alternative A are that the major changes that have occurred in Alternative A to reduce impacts for the Vehicle Recovery Course (PN72017) do not occur in Alternative B. Major changes that have reduced impacts in Alternative A also do not occur in the Southern Training Area Infrastructure (PN69743). Modifications that have occurred in the Modified Record Fire (MRF 7) (PN65049) and Firing Range 2 (Z2) (PN65036) also do not occur in Alternative B. The Unit Maintenance Facilities (PN69406) is included in Alternative B only.

Under Alternative B (refer to Tables 4.14-1 through 4.14-3), there is the potential to affect an estimated 147 cultural resources (refer to Table 4.14-4 for specific types and numbers). As with Alternative A, the areas that would be affected by ground-disturbing activities are substantial and the affect on cultural resources by this alternative is significant. With mitigation measures as discussed in section 4.14.3, the affect would be reduced to nonsignificant levels.

4.14.3 Mitigation Measures

The proposed avoidance, mitigation measures, and consultation would minimize or eliminate adverse effects to the historic properties. Refer to Tables 4.14-1 and 4.14-2 for mitigation recommendations for each affected resource. The mitigation measures for archaeological resources that are eligible or potentially eligible for inclusion on the NRHP consist of:

- avoiding direct effects to the resources through design;
- protecting resources from potential contamination during construction and operations through the SPCC and NPDES requirements;
- protecting resources through the use of signs and education of Soldiers;
- excavation/data recovery of historic properties in accordance with Fort Benning's HPC in the event that disturbance cannot be avoided, and;

- other mitigation measures as may be developed in consultation with the SHPO and federally recognized American Indian Tribes.

Data recovery plans would be prepared and implemented for each site undergoing extensive excavation as mitigation for disturbance. The field work portion of all data recovery operations and investigations should be completed prior to groundbreaking operations on the site. If previously unidentified cultural resources sites are discovered during construction or during the course of operations, the Cultural Resource Manager will be notified. Fort Benning will make an eligibility determination using HPC procedures. Eligible sites will require either (1) avoidance of impacts to the site's integrity through the use of additional protective measures (i.e. berms, redirecting routes); (2) excavation to acquire the scientific and historic information inherent within its archeological and historical context; or (3) other mitigation as determined through consultation. Fort Benning would comply with NAGPRA and implementing regulations if the situation arises.

The mitigation measures for architectural sites and historic districts eligible or potentially eligible for inclusion on the NRHP consist of:

- minimizing adverse effects to the structures through the design process;
- conducting HABS/HAER documentation prior to renovation or demolition; and
- using compatible styles and maintaining appropriate landscaping in accordance with Fort Benning's Historic District Tree Management Plan.

Mitigation measure for cemeteries include being fenced, flagged, and avoided. If avoidance is not possible, these resources need to be examined for historic significance and then removed in accordance with federal and state laws and regulations.

Consultation with the SHPO, federally-recognized American Indian Tribes, and interested parties to develop measures and implementation of mitigation would be conducted in accordance with SOPs of Fort Benning's HPC.

4.15 SAFETY

This section addresses safety aspects associated with training and operational activities conducted by units stationed at or operating from Fort Benning. Additionally, this section describes the safety aspects required for demolition and construction and also on- and off-duty transportation safety. These operations include activities within the cantonment areas as well as training conducted within the training ranges.

The Army Safety Program, AR 385-10 (U.S. Army 2000), governs Army policies, responsibilities, and procedures to protect and preserve Army personnel and property against accidental injury or loss of life. The regulation provides for operational safety, safe and healthy work places, and assures compliance with applicable safety laws and regulations. Army policy dictates that all Army plans, programs, decision processes, operations, and activities effectively integrate the following principles:

- Accidents are an unacceptable impediment to Army missions, readiness, morale, and resources requiring accident risk management to be employed by decision makers.
- Every level of decision maker will utilize the risk management process to avoid unnecessary risk to missions, personnel, equipment, and the environment.
- The acquisition process will maximize the use of engineering design to control unnecessary risks.
- Life cycle safety considerations will be considered in the acquisition, use, and disposal of chemicals and hazardous materials such that public health and safety is not endangered or compromised.
- Appropriate action is taken to quickly correct nonconformities with standards, hazards, and accident causes.
- Work performance standards for military and civilian managers and supervisors include accident prevention and occupational health and are rated on these aspects.

A key principal of the safety program is risk management. It is not possible to eliminate all safety risks associated with an activity but it is possible to minimize the risk through a risk management program. This program allows decision makers to assess the risk involved for each safety hazard, determine impacts to the mission or personnel should the event occur, and estimate the probability of the risk occurring. An extreme example of this would be an operation needed to transit a field littered with unexploded ordnance (UXO). The safety hazard would be inadvertent detonation of the bomb; the impact could be loss of life, serious injury, and/or equipment destroyed. In the likelihood that this occurrence could be high,, the risk would be considered catastrophic. The decision maker can minimize this risk by sending in an ordnance disposal team prior to crossing or find another way around the field and still meet mission objectives. Using risk management as a tool allows decision makers to prioritize the risks involved so the operation can be implemented in a safer manner.

Safety programs are required to include accident reporting, workplace safety, transportation safety, as well as family and off-the-job safety for all Installations and (where applicable) range safety, explosive safety, aviation safety, tactical safety, radiation safety, and system safety.

Accident Reporting and Records, Army Regulation 385-40 (U.S. Army 1994), details the classes of accidents and the reporting requirements for each class. The classes are designated A through F and range from loss of life to loss or damage of equipment by dollar value and the corresponding reporting requirement for each class of accident.

Workplace Safety applies to on-the-job safety and implements the requirements of 29 CFR 1910 *et seq*. These requirements include protective clothing and equipment, hazard materials communication, health and safety standards for the workplace, on-the-job reporting requirements, and myriad other requirements designed to protect the health and safety of workers.

Transportation Safety entails a large part of Army functions because most troop movements are done by ground-based vehicles. Army Regulation 385-55, *Prevention of Motor Vehicle Accidents* (U.S. Army 1987), provides the policies and procedures to install a transportation safety program at Army installations. This regulation includes both on the job and off-the-job safety requirements. On the job requirements describe safe handling, loading, and operation of government-owned vehicles ranging from automobiles to trucks to troop carriers to tanks. Vehicular accidents of Soldiers while off-duty are also a prime concern for the Army. Off the job topics stress training for vehicle operation for four-wheeled vehicles and motorcycles, seatbelt use, counseling, enforcement, and other prevention programs.

In addition to transportation, family and off-the-job safety is a critical part of safety and training programs for the Army. The Army provides training for off-duty activities such as recreation, in-home hazards, travel, and other topics.

Range Safety covers prevention of accidents on Army ranges. AR 385-63, *Range Safety*, (U.S. Army 2003) prescribes policies and responsibilities for ranges on the use of live firing of small arms, rockets, guided missiles, and lasers, and provides guidance for using risk management. Surface Danger Zones (SDZs) are a key aspect of providing safe range operations. An SDZ is an area downrange from a firing line which is an exclusion area for other activities and personnel such that bullets, fragments, and debris from the use of the range will stay contained within the SDZ. Figure 4.15-1 shows a typical layout of an SDZ.

Explosive safety entails the use, storage, and disposition of ordnance on Army facilities. The *U.S. Army Explosive Safety Program, AR 385-64* (U.S. Army 2000), provides the guidance for implementing explosive safety programs that comply with DoD Standard 6055.9. This includes explosive safety arcs around storage facilities, prescribes the coordination process between the Army and the Department of Defense Explosive Safety Board (DDESB), site survey requirements, and transportation of explosives.

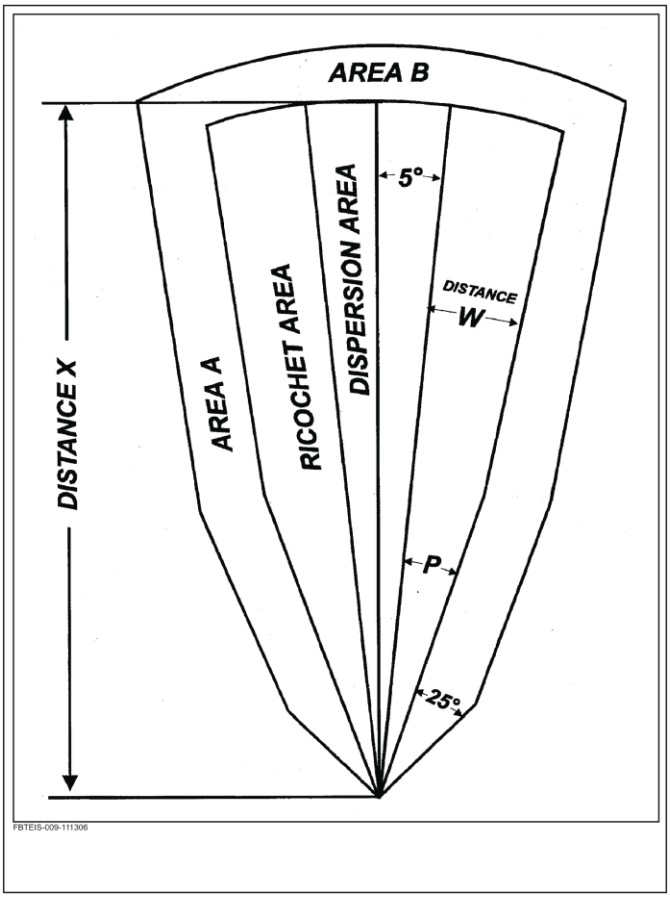


Figure 4.15-1: Typical SDZ

Aviation Safety involves all safety aspects of aircraft operations and responsibilities for personnel working in or around aircraft such as pilots and crew or maintenance personnel as well as individuals flying aboard aircraft. *Army Aviation Accident Prevention*, AR 385-95 (U.S. Army 1999), details the responsibilities and policies regarding aviation safety. Clear Zones and Accident Potential Zones are established near military airfields based on the analysis of military aircraft accident history and a determination of where, within the airfield environs, an accident is likely to take place and how large an impact area is likely to result from any single accident. Land use controls are implemented in these areas to reduce the level of risk associated with these zones.

4.15.1 Affected Environment

The ROI for safety encompasses the Installation and ranges associated with Fort Benning. On-duty and off-duty public safety encompasses the cantonment areas and includes operations and maintenance activities, transportation and construction safety, as well as provides the general safety background for the Post's personnel.

At Fort Benning, the Directorate of Public Safety commands the Military Police Units, the Fort Benning Fire Prevention and Protection Division, and the Post Safety Office. This Directorate ensures unity of

effort among Fort Benning emergency services to ensure a safe and secure environment to work, train, live, and play.

Public Safety

Scoping concerns identified areas along the Fort Benning border that are not fenced, with particular concern expressed about Chatsworth Road, located at the northern boundary of the Post. Existing Fort Benning security procedures increased access controls points and barriers ensure public safety and limit unauthorized access to the Installation.

Transportation Safety

Fort Benning provides transportation safety briefings for all duty personnel and families. Job requirements describe safe handling, loading, and operation of government-owned vehicles ranging from automobiles to trucks to troop carriers to tanks. Off duty topics stress training for vehicle operation for four-wheeled vehicles and motorcycles, seatbelt use, counseling, enforcement, and other prevention programs.

Construction Safety

Construction and demolition activities performed or contracted by the USACE must follow the *USACE Safety and Health Manual* 386-1-1 (USACE 2003b). This manual outlines all of the requirements to comply with OSHA standards during the construction and demolition process. Non usage contracts would not necessarily be required to follow the USACE manual, but would be required to comply with all applicable OSHA standards and regulations.

Explosive Safety

Infantry training at Fort Benning has been conducted since the establishment of the Installation in 1918. Infantry training has required, and continues to require, the use of "blank" as well as "live" ammunition. The type of ammunition used for training purposes is very diverse. It encompasses virtually every weapon system from small caliber individual weapons to air-delivered 500-pound bombs, with the exception perhaps of some long-range artillery guns or missiles and air defense systems. Blank ammunition and various pyrotechnic simulators are used throughout the entire training area. Live-fire training is conducted in designated ranges and training areas, with projectiles directed towards designated ordnance impact areas. Current annual weapons use at Fort Benning is presented in Table 4.15-1.

Table 14.15-1: Baseline Annual Weapons Use

	Day	Night	Total
Small Caliber	35,200,000	3,480,000	38,680,000
Percent Day/Night	91%	9%	
Large Caliber	472,000	59,000	531,000
Percent Day/Night	87%	13%	

Source: USACHPPM 2008 and Fort Benning 2007b.

Explosive safety quantity distance arcs are imaginary arcs surrounding ammunition storage igloos to provide a safety buffer in case of a detonation inside the bunker. Certain activities and personnel density limits are instituted within these arcs to protect people and facilities from explosion and fragmentation.

The main "dudded" ordnance impact areas on Post are compartments A20 and K15 with 9,300 and 5,500 acres, respectively. Smaller isolated "dudded" ordnance impact areas are found in the periphery of the main ordnance impact areas and within the Malone Range Complex (USACE 2006). The Fort Benning military and civilian personnel and the community are routinely advised and reminded not to handle any suspected UXO, and to report suspicious ordnance to the Explosive Ordnance Detachment and to the Director of Public Safety through calling 911. UXO warning articles are periodically published in the Fort Benning Bulletin, as well as in the Post newspaper, *The Bayonet*.

Range Safety - Surface Danger Zones

Fort Benning currently offers 129 ranges; 42 basic marksmanship ranges, 10 direct fire gunnery ranges, 19 collective live fire ranges, 32 indirect firing facilities, 7 special live fire ranges, and19 non-live fire facilities (U.S. Army 2007a).

The SDZ is an "invisible" line that surrounds the firing range and ordnance impact area portions of a range and provides a buffer area to protect personnel from the non-dud producing rounds that may be ricocheted during operation of the range. Weapons safety requirements direct Soldiers to orient the barrels of their weapons downrange within the SDZ to ensure the safety of others. For each training scenario on a range, the SDZ is computed to take into account the firing positions and ordnance used, so the SDZ exclusion zone will vary. For the purposes of this analysis, the cumulative/maximum SDZ possible for the action alternatives will be utilized. The SDZ is an "exclusion" or safety zone for personnel on or in the vicinity of the range. Fragment or projectile scatter has an approximately one in a million chance of landing outside of the SDZ (personal communication, Weekley 2006). SDZs are updated on the basis of data derived from research and development, testing, and/or actual firing experience and differ depending on the type of activity occurring on the range (small arms training versus tank gunnery) and the type of ammunition being fired on the range (AR 385-63). The area comprising the SDZ is closed to all personnel not directly using the range complex during currently ongoing exercises. The total accumulated acreage associated with the SDZ for the current ranges equals 52,396 acres. Figure 4.15-2 shows the current ranges and SDZs.

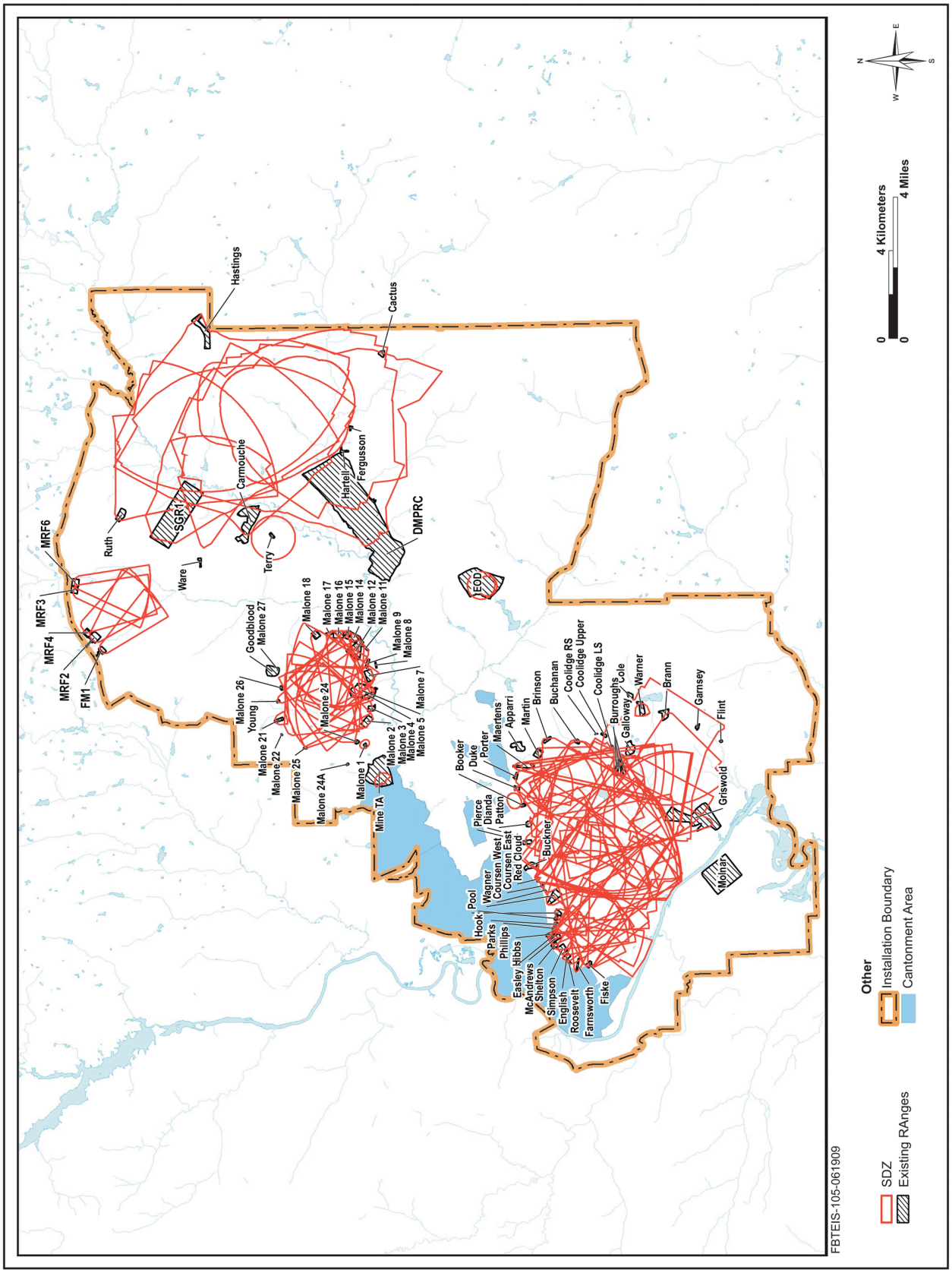


Figure 4.15-2: Baseline SDZs

4.15.2 Environmental Consequences

The threshold level of significance for safety is exceeded when construction would occur within an area with UXOs; the SDZ exclusion area overlaps with personnel support areas; the SDZ of a range extends off the Installation, or is granted an exception per AR-385-63; or when a violation of applicable OSHA standards occurs. All workers must adhere to safety standards established by the Installation November 2003 *U.S. Army Corps of Engineers Safety and Health Requirements Manual* EM 385-1-1, and OSHA.

4.15.2.1 No Action Alternative

All safety procedures such as public safety, transportation, etc. would remain as described for the baseline. The would be a slight increase of weapons use under the No Action over the baseline, see Section 4.2.2.1 for the amount of rounds used under the No Action Alternative.

Range Safety - Surface Danger Zones

Under the No Action Alternative, there would be 12 new ranges covering 4,529 acres constructed by 2011. The SDZs associated with the proposed ranges would encompass 56,925 acres if all of the ranges were active at the same time. Of these 56,925 acres, only a small piece of an SDZ falls outside the Installation boundary near the Hastings Range. AR 385-63 allows for SDZs to extend past the Installation boundary only if the area meets the requirements of AR 385-63, and if an agreement is made with the landowner; applicable environmental and local regulations are met; and controls are in place to prohibit entry by unauthorized personnel and to provide decontamination after use. Figure 4.15-3 shows the ranges and SDZs associated with the No Action Alternative. Among the duties of a Range Safety Officer (RSO), present at each active firing range, is to ensure there are no unauthorized personnel or equipment located downrange while the range is being used. The new small arms ranges, in the northern area of the Installation (near Chatsworth Road), would be controlled by an RSO so the chances of an unauthorized citizen being on range and in danger is minimal. There is no record of any small arms round incident impacting anywhere within the community either on- or off-Post. A long-term solution would be fencing to prevent unauthorized entry onto the Installation. A northern security fence is being analyzed as part of Alternatives A and B in this EIS and would provide approximately 10,000 feet of security fence.

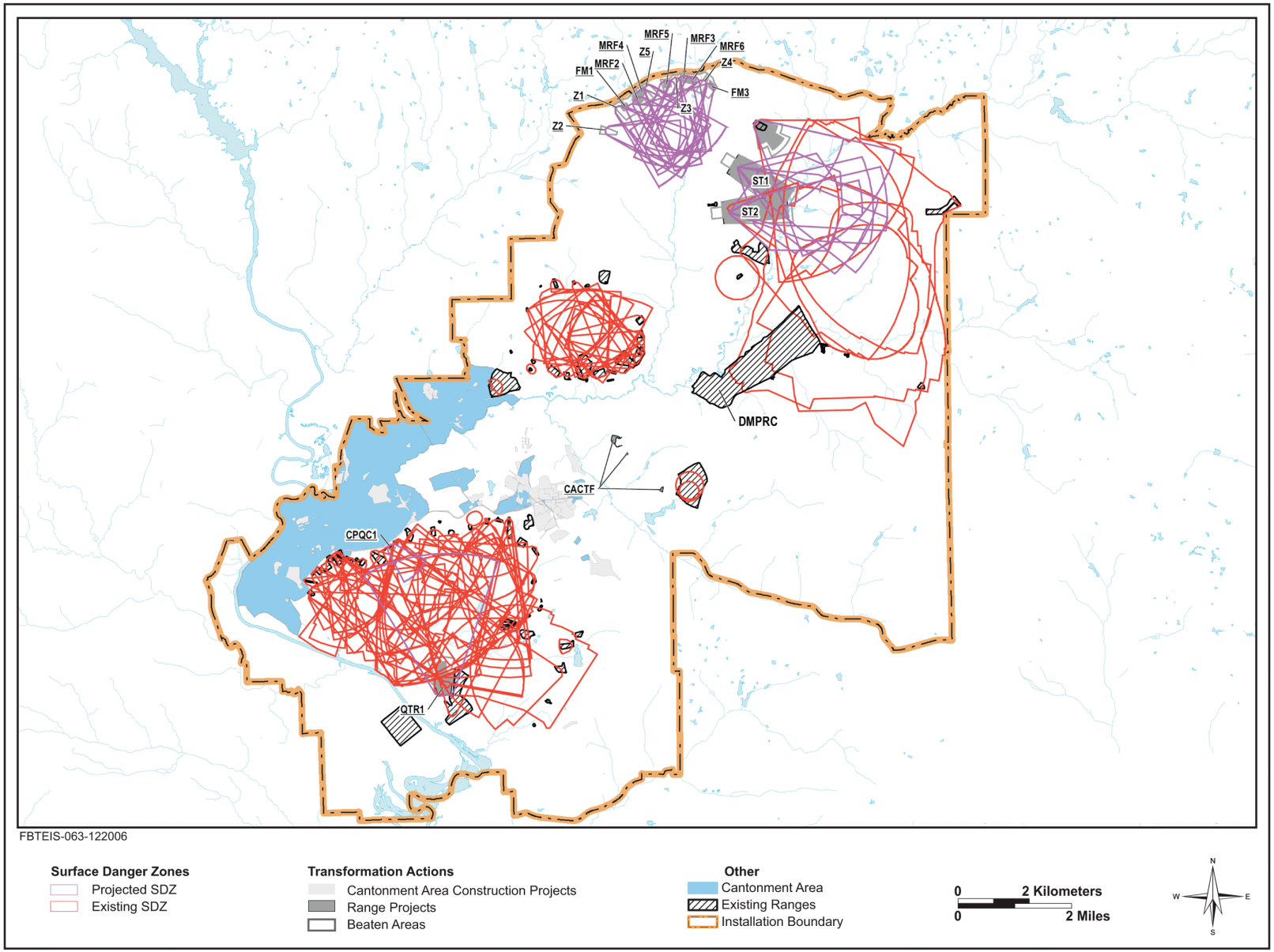


Figure 4.15-3: SDZs under No Action Alternative

4.15.2.2 Alternative A (preferred alternative)

Similar to the No Action Alternative, Alternative A would not change any safety procedures described in the Baseline Conditions. Alternative A would differ from Alternative B in that it would have three fewer ranges. There would be a slight increase of weapons use under Alternative A over the baseline, see Section 4.2.2.2 for the amount of rounds used under Alternative A and B. Under Alternative A, there would be 1,797 acres of additional SDZs. Figure 4.15-4 shows the ranges and SDZs associated with Alternative A.

4.15.2.3 Alternative B

Similar to the No Action Alternative and Alternative A, Alternative B would not change any safety procedures described in the Baseline Conditions. Under Alternative B, there would be 2,524 acres of additional SDZs. Figure 4.15-5 shows the ranges and SDZs associated with Alternative B.

4.15.3 Mitigation Measures

For all action alternatives, adherence to the safety regulations and manuals noted are required. There are no significant safety impacts to safety.

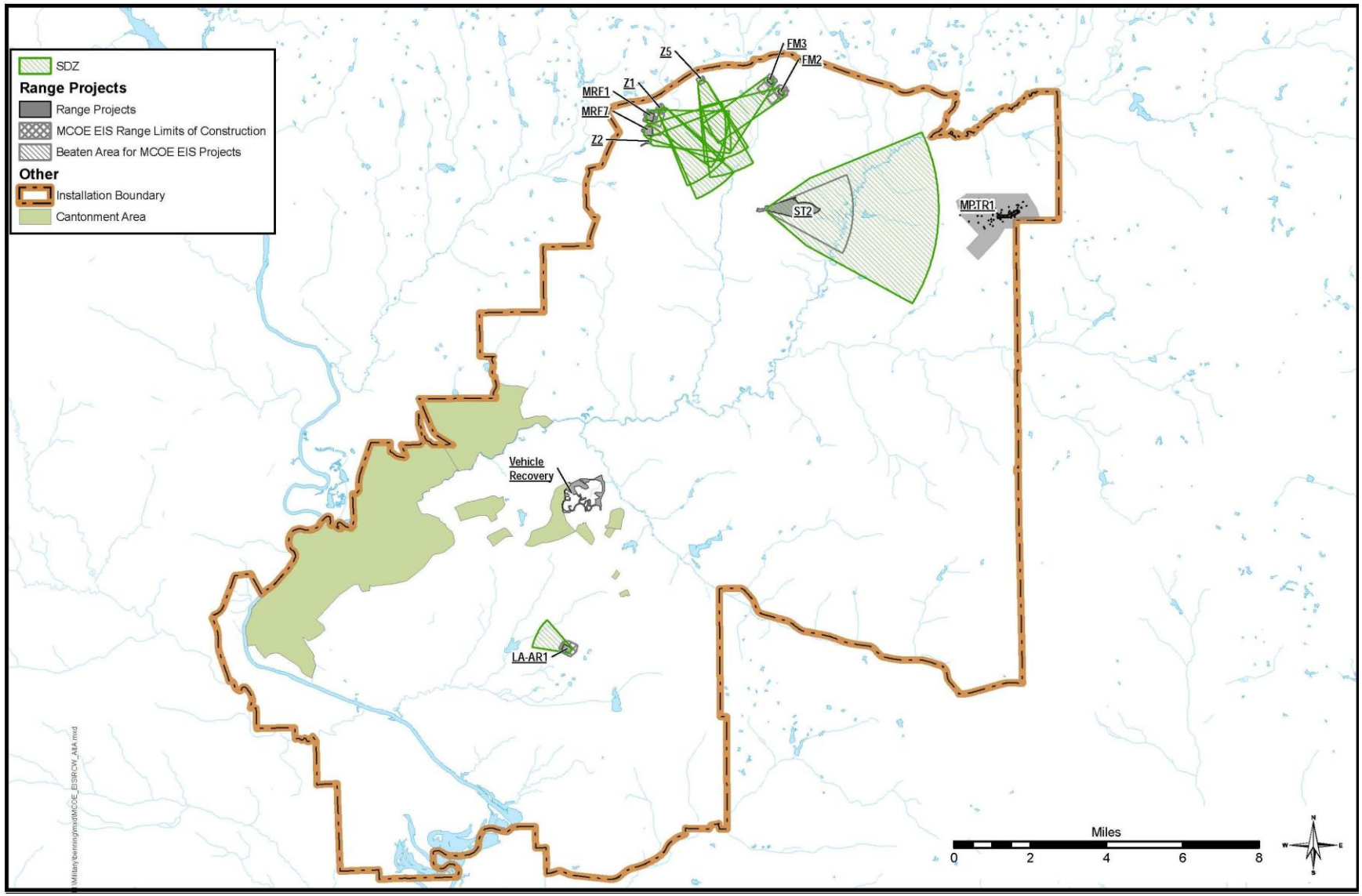


Figure 4.15-4: SDZs under Alternative A

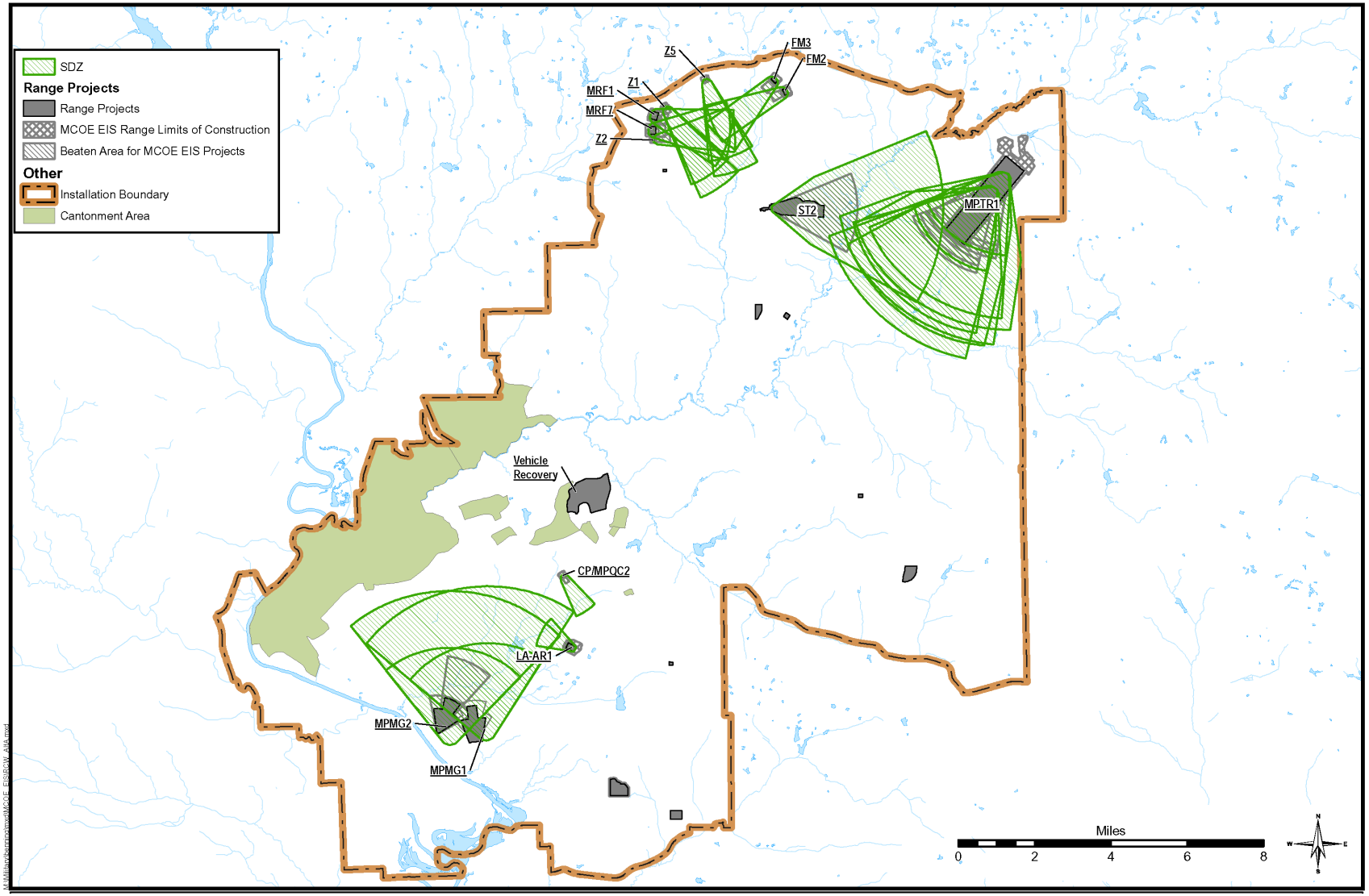


Figure 4.15-5: SDZs under Alternative B

4.16 CUMULATIVE IMPACTS

The CEQ defines cumulative impacts as the "impact on the environment which results 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" (CEQ 1508.7).

4.16.1 Army 11-Step Process

The Army uses a process for cumulative effects analysis process that follows the 11 steps identified by CEQ. Step 1 identifies the significant effects issues associated with the Proposed Action and defines assessment goals. Step 2 establishes the analysis geographic scope. Step 3 establishes the analysis time frame. Step 4 identifies other actions affecting the VECs (i.e., resources, ecosystems, and human communities) of concern. Steps 5 and 6 characterize the VECs identified in steps 1-4 and their responses to environmental changes. Step 7 defines the baseline condition for the VECs. Step 8 identifies the important cause-and effect relationships between human activities and the VECs. Step 9 determines the magnitude of cumulative effects on the selected VECs. Step 10 modifies alternatives to avoid, minimize, or mitigate significant cumulative effects. Step 11 monitors cumulative effects of the Proposed Action and management adaptation. The following cumulative effects analysis follows the 11-step process described above.

4.16.1.1 Step 1: Identification of Significant Issues and Assessment Goals

The assessment goal is to determine the appropriate level of cumulative analysis for each VEC and to determine incremental impacts of the Proposed Action on nearby resources, ecosystems, and human communities. The cumulative analysis applies to both Alternative A and B, unless otherwise specified. CEQ guidance (CEQ 2005) states that "It is not practical to analyze how the cumulative effects of an action interact with the universe; the analysis of environmental effects must focus on the aggregate effects of past, present, and foreseeable future actions that are truly meaningful. Thus, analysis must narrow the focus of the cumulative effects analysis to effects of significance to the proposal…based on thorough scoping." The cumulative impact analysis will focus on those VECs that are expected to have significant direct or indirect effects, as well as those VECs that are of concern in the Fort Benning region in consideration of the scoping process for this EIS (see Section 1.4.3 and Table 4.1-2) and the environmental consequences and mitigation analysis for VECs (described in the second and third subsection of Sections 4.2 through 4.15, respectively). One VEC, Aesthetics and Visual Resources, would have negligible and temporary direct/indirect impacts due to construction near the construction areas. These impacts are limited and would result in no cumulative impacts; therefore no further cumulative impacts analysis will be conducted on this VEC. A couple VECs would have no significant direct/indirect impacts and are relatively low concern in the region, so a less detailed cumulative analysis review will suffice for Utilities and Hazardous and Toxic Materials and Waste. Several other VECs would have no significant direct/indirect impacts; however the VECs are of high concern in the region and include: Socioeconomics (including Economic Developments and Demographics although the

Proposed Action is expected to have a significant beneficial effect on that VEC); Transportation; Air Quality; Cultural Resources; and Safety. The Proposed Action may have significant direct/indirect impacts and are of high concern in the region, these include: Land Use; Water Resources; Geology and Soils; Noise; and Biological Resources.

4.16.1.2 Step 2: Geographic Scope of Analysis

The overall ROI for the purposes of this EIS consists of Chattahoochee, Muscogee, Marion, and Talbot counties, Georgia and Russell County, Alabama; this ROI includes the cities of Columbus, Buena Vista, and Cusseta, Georgia; Phenix City, Alabama; and the Fort Benning Military Installation. However, for various VECs, the geographic scope is dependent on the characteristics and location of affected VECs. These ROIs may be larger or smaller in size than the overall ROI and are defined in subsequent sections.

4.16.1.3 Step 3: Analysis Time Frame

By definition, the time frame for the analysis must include the past, present, and future. For most VECs, the period within the last ten years at Fort Benning marks the past temporal boundary for the cumulative effects analysis. The future temporal boundary should include the useable life of the Proposed Action and other reasonably foreseeable actions within that overall time line. The temporal boundary for the present is defined by actions in detailed planning, under construction, or which have been recently initiated. Because the effects of Army Growth are expected to be long-term, the future temporal boundary is bound by that which can be reasonably foreseen, in this case approximately ten years.

4.16.1.4 Step 4: Other Actions Affecting VECs

Other past, present, and future on-Post and off-Post actions that could influence the VECs carried forward for further analysis from Step 1 are addressed here. This includes consideration of the other past and present actions and their locations, the extent of their direct and indirect effects, any likely future actions, and their relative contribution to cumulative effects on the specific VEC.

4.16.2 Past and Present Actions

In accordance with CEQ's guidance (CEQ 2005), actions identified herein are focused on those that are relevant and useful in analyzing whether or not the reasonably foreseeable effects of the Proposed Action may have a continuing, additive, and significant relationship to those effects. CEQ guidance emphasizes a focus on the current aggregate effects of past actions without delving into the historical details of individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined. Present actions include those in detailed planning, under construction, or which have been recently initiated. On-Post actions are described first, followed by off-Post actions.

Within Fort Benning

Establishment and Ongoing Army Use of Fort Benning. The military history of Fort Benning is detailed in Section 4.14.1.1. In terms of the VECs carried forward for cumulative effects analysis, these past actions had the effects of converting land use to support evolving Army uses, the socioeconomic

impacts associated with the Army's presence in the ROI, transportation infrastructure that evolved in support of and around the Post, introduction of noise associated with Army training and operations at Fort Benning, and impacts to biological resources. In terms of land base, the most recent action taken by Fort Benning was a FY99 land exchange with the City of Columbus. Two parcels of land, known as the North Tract (2,470-acre parcel located adjacent to the present Fort Benning northwestern boundary line) and the South Tract (2,536-acre parcel located at the southernmost end of the Installation), were swapped. An EIS and ROD, as well as a BA and BO, were prepared for this action (Fort Benning 1999). Columbus is currently developing the North Tract. This development will be primarily industrial, mixed with recreational land use. In exchange, Fort Benning received the South Tract, which is currently used by the Installation for training and land management (reforestation and habitat restoration) purposes.

FY07 and FY08 Realignment and Transformation Projects. The projects listed in Table 3.1-1 are those FY07 and FY08 realignment and transformation projects that are included in the baseline conditions. These represent recent past and present projects for Fort Benning.

Residential Communities Initiative (RCI). Consistent with authorities contained in the 1996 Military Housing Privatization Initiative, Fort Benning has transferred responsibility for providing housing and ancillary supporting facilities to Fort Benning Family Communities LLC. Fort Benning conveyed existing homes in 10 housing areas and provided a 50-year lease of the land underlying existing homes, as well as an additional 536-acre site for new housing. An Environmental Assessment (EA), Finding of No Significant Impact (FNSI), and errata sheet have been prepared for this action (Fort Benning 2005f). Between 2005 and 2015, plans call for an end state of 4,200 homes and an incremental program for the demolition of approximately 2,200 homes; construction of approximately 2,400 new/replacement homes; and renovation of approximately 1,600 homes. The remainder of the homes is existing units that would not have any major work done on them within this timeframe (Brown, 2008).

Ongoing Improvements and Training at Ranges and other Training Areas. Minor range construction and target maintenance projects are ongoing activities at Fort Benning. These types of improvements have been assessed for environmental effects and NEPA documentation has been prepared for these ongoing activities. Additionally, training activities are ongoing at ranges and other training areas; there have been some recent increases in training operations of the same type and nature as historical training activities. In FY06, a new Infantry Platoon Battle Course (IPBC) was constructed in the A12 portion of Fort Benning and included tree clearing, grading, cut-and-fill, construction of the range and target firing area, and placement of targetry, in addition to the construction/emplacement of support facilities, access roads and trails, and associated utilities. Approximate size of the overall project area is 1,000 acres. An EA was prepared for this action (Fort Benning 2005g). A Digital Multi-Purpose Range Complex (DMPRC) and adjacent associated range facilities are under construction near the D13 area on Fort Benning. Once operational, the DMPRC will be state-of-the-art range facility for conducting advanced gunnery exercises in a realistic training environment. The DMPRC design includes as many as 22 water crossings (average dimensions: 350 ft long by 29 ft wide each), and up to 1,500 acres of vegetation removal on the construction site is required. The DMPRC is being constructed on approximately 1,800 acres and an EIS

and ROD was prepared (Fort Benning 2004b). A Supplemental EA and FNSI was signed in February 2008 to cover conditions that may be changed since the ROD was signed.

Outdoor Recreation. In recognition that Fort Benning population growth is expected to increase demand for outdoor recreational activities, the Installation has developed a plan to upgrade or improve existing facilities. The plan includes construction of new outdoor athletic facilities, trails, RV and camp sites, and chalets for quality recreational opportunities. Through an outdoor recreation planning process, 11 areas were identified for specific construction and improvement. An EA and FNSI were prepared for the expansion of Uchee Creek Campground in 2007. An EA and FNSI were also prepared for the Fort Benning Outdoor Recreation Plan for the upgrade and construction of sports fields, RV sites, picnic pavilions and concessions, campgrounds, and playgrounds (Fort Benning 2009c).

Within the Fort Benning Vicinity

Fort Benning Joint Land Use Study (JLUS). In May 2008, a JLUS was completed for Fort Benning. Partners in the JLUS study include: Columbus-Muscogee, Cusseta-Chattahoochee, Harris, Marion, Russell, Stewart, and Talbot Counties; City of Phenix; Middle Flint and Lower Chattahoochee Regional Development Centers; Lee-Russell County of Governments; and Fort Benning. The JLUS was prepared with input from a Task Force comprised of area planners, city and county managers, technical and professional staff, military planners, and representatives from TNC. A Policy Committee (consisting of local elected officials from each participating jurisdiction, along with leadership from Fort Benning and Lawson AAF and senior representatives from stakeholder organizations) was responsible for the overall direction of the JLUS process, review of the draft and final written reports, consideration of policy recommendations, and the future monitoring of recommendation implementation and adopted policies.

The purpose of the JLUS is to: ensure that the military mission can continue without degrading the public health, safety and welfare of surrounding communities; sustain economic development without hindering national military readiness; identify regulatory and non-regulatory actions to ensure future land use compatibility between local governments and military installation; continue to foster increased communication between Fort Benning and surrounding local governments and communities; and to ensure that the economy remains strong and the Army is able to continue its mission efficiently and effectively. The implementation of the JLUS is the responsibility of locally elected officials and potentially foreseeable future impacts related to JLUS implementation are discussed in Section 4.16.4.2.

Fort Benning ACUB Program. Most major Army Installations, including Ft. Benning, have a training lands deficit. In December 2002, Congress provided legislative authority to expand the Private Lands Initiative. Section 2684a of 10 U.S. Code allows military departments to partner with government or private organizations to establish planning areas around active training and testing areas. In 2003, the Army developed a strategy to examine its training needs in terms of required versus available training lands. Four alternative approaches were used to address the recognized shortfalls: buffering of existing land through the ACUB program; sustainable management; use of other federal/state land; and purchasing

additional training land. Fort Benning is carefully considering all of these potential alternatives to address the future training challenges the post faces.

The ACUB program allows an Installation to work with partners to encumber land to protect habitat and training without acquiring any new land for Army ownership. Through ACUBs, the Army reaches out to partners to identify mutual objectives of land conservation and to prevent development of critical open areas. In turn, the military can conduct training and operations with little compromise while local communities' partnerships assume habitat, biodiversity, and wildlife management responsibilities (U.S. Army 2006d).

Fort Benning has teamed with stakeholders to place lands within the 3-mile ACUB –planning areas surrounding the Installation into a conservation easement to ensure future development does not encroach on Installation land and impede mission critical training. TNC is Fort Benning's conservation partner charged with developing, planning, negotiating, and securing ACUB land interests. TNC has worked closely with Fort Benning, with staff on Post, since 1993. Other stakeholders include Chattahoochee Valley Land Trust, Georgia Land Trust, Alabama Land Trust, Alabama Forest Resource Center, U.S. Fish and Wildlife Service, Trust for Public Lands, State of Georgia, W.C. Bradley Company, and Enon Plantation (see Figure 4.16-1 for priority ACUB areas).

Key ACUB strategies are:

- promote "no-development" in lands in 1- to 3-mile zones around the northeastern and western sides of the Installation, primarily for noise and smoke land use compatibility;
- Fall Line habitat protection and restoration extending out along the northeast boundary as much as 10 miles, to secure viability of gopher tortoise and relict trillium off Post, as well as other associated rare species and wetlands, and provide future habitat for RCW; and
- mature pine habitat protection and restoration, extending westward into Alabama providing similar Fall Line habitat, as well as the best opportunity for near-term RCW restoration and protection off Post by linking existing habitat.

FY06 is the first year the program was implemented at Fort Benning and between FY06 and FY08, DoD has funded $4.4 million for TNC to acquire land interests adjacent to the installation via the ACUB program. Approximately half of this funding was used to acquire three parcels that buffer Fort Benning's northeastern boundary. The three parcels total 873 acres, were purchased in fee, and will be sold to conservation buyers encumbered with permanent protective easements for a projected $1 million (which will further fund the ACUB program). Fort Benning and TNC will conduct restoration management prior to the sale of the property. An additional 1,100-acre easement was secured near the northeastern corner of the Installation through a combination of the ACUB program and landowner donation. With remaining and future funding, the program is targeting lands located south of the installation along the

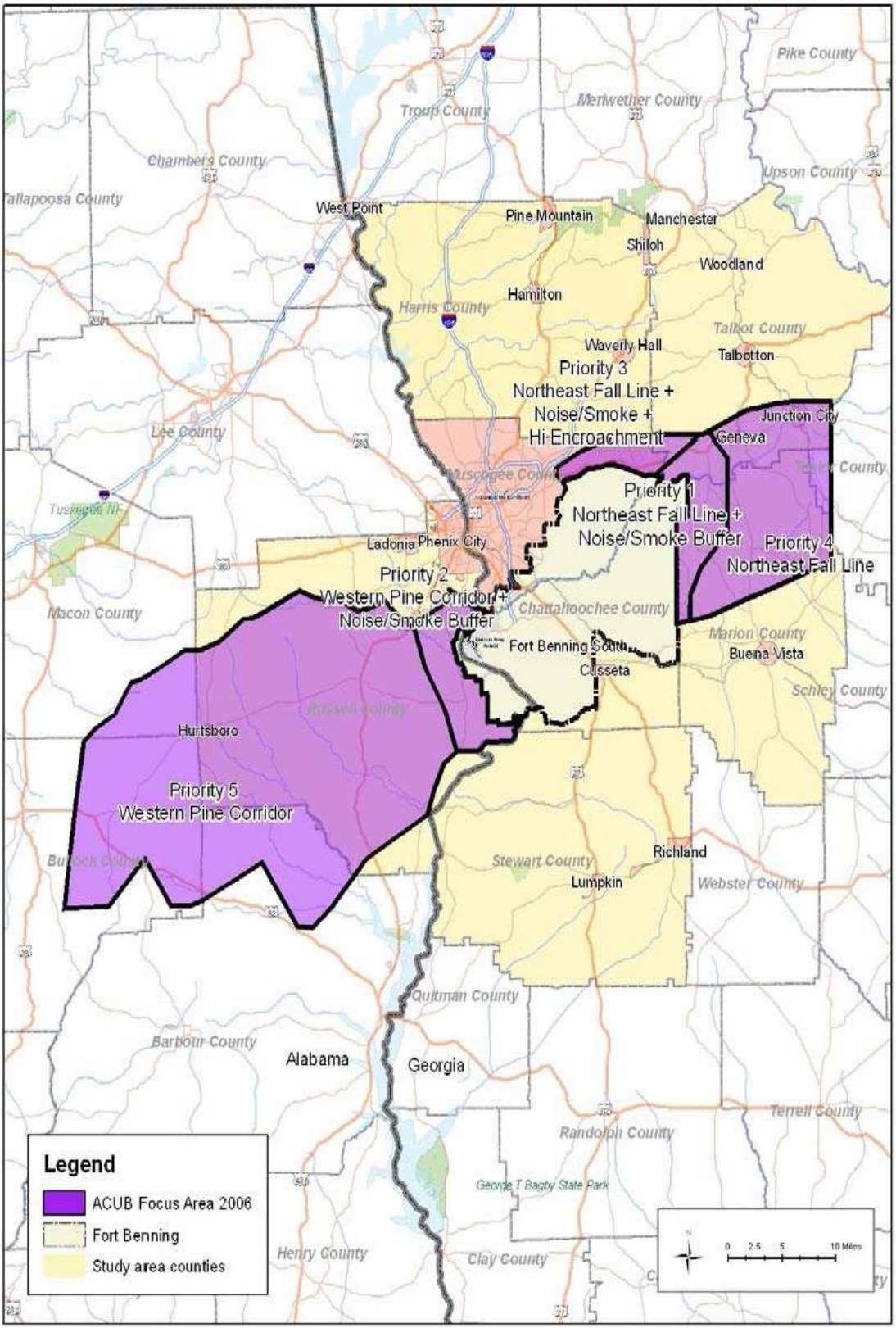


Figure 4.16-1: ACUB Priority Areas

As of March 2009, the TNC had purchased approximately 2,800 acres of property whose upland acres were considered suitable for RCW habitat/management. Future plans are for the TNC to increase this total to over 3,000 acres by the end of 2009 (Fort Benning 2009a). While the TNC currently manages the properties consistent with RCW habitat goals, there are parallel sustainable benefits to multiple natural resources as a result of these proactive sustainable actions. Fort Benning, working with the Army Environmental Command and Readiness and Environmental Protection Initiative program managers, has identified approximately $5 million per year through 2013 that could be used to protect approximately 10,000 to 20,000 acres beyond the current totals (Fort Benning 2009a).

Ongoing Forest Industry Divestment of Timberlands. Much of the land surrounding the northeastern, eastern, and southern boundaries of Fort Benning was formerly held by timber companies (including MeadWestvaco, Ingram and Legrand, and Weyerhaeuser). This land has been sold in recent years as these timber companies are divesting of their forestland holdings.

In 2007, MeadWestvaco sold more than 200,000 acres, including much of its land base south of Fort Benning to Wells Timberland Real Estate Investment Trust. MeadWestvaco retained a fiber supply agreement for the Mead Westvaco paper mill. Over the previous two years, Ingram Legrand Company sold some 70,000 acres south of Fort Benning to The St. Joe Company, a Florida-based real estate company. The St. Joe Company has divested at least a portion of this land base closest to Fort Benning to Timbervest, a timberland investment management organization (personal communication, Harrison 2008).

Aflac, Incorporated Expansion. Aflac, an international holding company based in Columbus, GA, is one of the area's largest employers and is expanding to accommodate 2,000 new administrative professional employees by 2009. An additional 340,000 square feet of office space is being constructed at the company's Paul S. Amos Campus at Corporate Ridge in Columbus. Phase I of the construction (90,000 sf) was completed in 2007 and Construction on Phase II of the project, consisting of about 165,000 sf, was scheduled to begin August 2007 and completed in early 2009 (Aflac 2007). In 1998, Aflac established its Computer Service Center, which employs 600, and, in 2001, the company opened the Corporate Ridge office, which handles claim processing and call center operations (Aflac 2005).

Transportation Improvements. Highway improvements were recently constructed at Interchange 105 at I-185 and U.S. Highway 27/280 in Columbus. Safety improvements also include removing and replacing guardrails and possibly installing medians along 10.5 miles of U.S. Highway 27/280. Approximate size of the overall project area is 5 to 10 acres. A 1.15-mile stretch of Buena Vista Road was recently widened and reconstructed from a two- to four-lane roadway. Approximate size of the overall project area is 5 to 10 acres (Fort Benning 2005h). Two projects account for: (1) the widening of a 1-mile stretch of St. Mary's Road from Buena Vista Road to Robin Road (to be completed by the end of calendar year 2007) and (2) widening/reconstruction of a 1.25-mile stretch of St. Mary's Road just west of Fort Benning from Robin Road to Northstar Drive. Intersections were reworked and the existing bridge over I-185 was widened as part of this project (Georgia Department of Transportation 2006). Approximate size of the overall project area is 10 to 20 acres.

General Urban Growth. The urban growth associated with the Columbus Metropolitan Area has been robust over recent years and is expected to continue, particularly when considering the alternatives coupled with the aforementioned cumulative impact projects. A 2003 Government Accounting Office Testimony on the DoD's approach for managing encroachment used Columbus and Fort Benning as an example of rapid growth near a military installation; see figures in Section 4.3. Through the previously mentioned ACUB and JLUS as well as other programs, the Army and Fort Benning have been working with the community to appropriately plan development near the Installation.

4.16.3 Reasonably Foreseeable Future Actions within the ROI

Reasonably foreseeable future actions include those beyond mere speculation, but within the time frame for analysis. Like the past and present actions, on-Post actions are identified first and are followed by off-Post actions.

A reasonably foreseeable future action is the relocation of the Scout Leaders Course field training to a site outside of Fort Benning current boundaries. This action could include moving this training to another military installation or acquisition of land; however, it is too early to determine the level of cumulative impacts. This would be evaluated in future NEPA documentation.

Within Fort Benning

Movement of the Material Recycling Center (MRC). This project consists of disassembling Building 4000 in its current location and reassembling it in vicinity of the 718th MP Building 4960. No digging or grading is required to relocate the MRC. After the project is completed, the asphalt slab on which the building previously stood will be removed.

Army Lodging Facility. This project includes construction of a 860 room hotel based on a conceptual five story Army lodging facility in the Fort Benning area adjacent to the on-post housing and several community facilities consisting of 60 standard rooms, 740 extended family rooms and 60 family suites This project will provide adequate Army lodging facility space to accommodate Temporary Duty (TDY) personnel and Permanent Change of Station (PCS) personnel and their family members traveling on official orders into or out of the Fort Benning area. This facility will also support students who are part of the Institutional Training Directed Lodging and Meals program. There are no existing facilities in the Fort Benning Community capable of being economically renovated to meet the required number of guest rooms and to meet the required lodging standards. It is expected that near future restationing planned actions will generate a high level of official travelers to Fort Benning.

Georgia Army National Guard Warrior Training Center. The Georgia Army National Guard proposes to expand and update existing Warrior Training Center (WTC) training capabilities to accommodate evolving and changing combat missions and a potential for increased numbers of National Guard Soldiers. The WTC is located on approximately 40 acres at Camp Butler, in the Harmony Church cantonment area. The Proposed Action would add up to two Companies (C and D) to support amplified training tempo; construct new facilities, as well as renovate and demolish some existing buildings and some roads to modernize and properly accommodate Soldiers at the WTC; and refurbish training areas to

better meet the training curriculum within the existing 40-acre site. An EA is being prepared for this action.

Upgrading Hastings Range to Include a MPTR. This would be a potential future project for the No Action Alternative and Alternative B that has been discussed for implementation in the FY15 timeframe. Work would consist of upgrading the existing Hastings Range to include a MPTR that would include removal/replacement and upgrading of existing targetry, expansion of the existing tank trails, construction of associated support facilities, demolition of currently existing temporary buildings on site, and associated utility placement. Approximate size of the overall project area is 1,000 acres (Fort Benning 2004b). The upgrades to the Hastings Range would be developed within the existing footprint of the Hastings Range and not include additional land disturbance outside of the footprint. This upgrade would not be considered part of the cumulative impacts for Alternative A, only under Alternative B.

Addition of the M1200 Armored Knight (M1200 AK) to Replace the M707 Knight High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and the M981 Fire Support Team Vehicles. The M1200 Armored Knight is a modification to the M1117 Armored Security Vehicle (ASV) designed to increase the survivability to the existing HMMWV currently used by the Military Police Combat Support Company. The M1200 Armored Knight vehicles are intended to replace, not be in addition to, the M707 HMMWV and M981 Fire Support Team vehicles. The Armored Knight would utilize the same training areas as the vehicles they are replacing and have been reviewed through the NEPA process as having no significant impact as to their field application (TACOM, 2008). These vehicles will use the same maintenance facilities and have approximately the same impacts to air quality, water quality, hazardous waste management, cultural resources, listed species, vegetation, land use, and aesthetic resources as the vehicles they are replacing (TACOM, 2008)

Construction of a Tactical Unmanned Aerial Vehicle (TUAV) Hangar. In response to the 75th Ranger Regiment acquiring TUAV capability, the Installation has planned for the construction of a hangar to support the new equipment and unit task organization. TUAV capability is to include the addition of a TUAV Platoon and Type III Shadow TUAV's. The 9,200 square foot hanger will significantly improve the unit's operational readiness by including administration space, training storage, general storage, parts storage, equipment parking, comsec vault, restrooms, showers, lockers, and a composite metal repair area. There are currently no facilities available on Fort Benning to adequately support this unit. Construction is estimated to begin in March 2014 and be completed by March 2015.

Expansion and Renovation of 3rd Battalion, 75th Ranger Regiment, Battalion Headquarters. Expansion and renovation of the Battalion Headquarters is expected to correct deficient spatial capabilities currently affecting the unit's ability to meet mission requirements. The project will include a 6,051 square foot expansion to the current building and renovation of an additional 5,950 square foot within the building. Supporting facilities such as paving, sidewalks, curbs and gutters, and drainage will also be included. The project will provide increased area for general office and file space, including the Chaplain's Office, Chaplain's Assistant Office, Family Readiness Group, and Career/Retention. Construction is estimated to begin in October 2010 and end in October 2011.

Construction of a Military Working Dog Kennel. The Installation has planned to construct a 3,500 square foot animal shelter to include training areas, space for food preparation and dog treatment, tack storage, and office space. The facility is expected to accommodate up to ten working dogs and provide sufficient space to carry out dog training exercises. Construction of the kennel is planned to begin in March 2015 and end in March 2016.

Harmony Church Car Wash and Java Café. The Car Wash will be situated north of Eighth Division Road in the western portion of Harmony Church and the Java Café will also be located north of Eight Division Road in the eastern portion of Harmony Church. These projects are FY11 projects.

Legal and Judicial Center. This project in Main Post, slated for FY 2010, will allow for a centralized legal and judicial center to house offices of the Staff Judge Advocate, courtroom complex and the Military Judge. The law center will support the 60 attorneys, paralegals, and support staff assigned to Fort Benning along with a maximum client load of approximately 300 persons per day. The proposed complex will re-establish legal services and military justice services in a central location and proceedings to respond to the needs of the Fort Benning Soldiers, their family members, and military retirees in a timely fashion.

Harmony Church Troop Store. This project is proposed for Harmony Church which will provide a location for soldiers and their families to purchase goods and supplies. The store will provide supply services during the interim period of construction of a Mini-Mall in Harmony Church noted below.

Army and Air Force Exchange Facilities Services Projects for the Armor School (AAFES). These AAFES projects consists of construction of a commercial auto service center in Main Post in FY11 near the old PX, and a Mini-Mall in Harmony Church slated for construction in FY11. The mall will provide a beneficial option shopping for Harmony Church residents.

3rd ID BCT Complex (PN63799). While the PN for this FY11 Complex is found under the No Action Alternative (and was not addressed in either Alternative A or B), it will likely grow in size and be moved from the original Harmony Church location to Kelley Hill. Before the decision is made to make this move, NEPA documentation will be completed.

Additional Family Restaurants. Two additional family restaurants will be added on previously disturbed lands in the Main Post. Both restaurants will be approximately two acres each and will be located on either side of the existing theatre on Ingersoll Street in Main Post. These restaurants are expected to open by FY11. Another additional family restaurant will be built in FY 11 near Wetherby Field near Highway 27/280.

Within the Fort Benning Vicinity

The projects listed below are those that occur beyond the Fort Benning boundary but within the ROI and were determined to be relevant for cumulative impact analysis.

Oxbow Project. At the Oxbow Meadows Environmental Learning Center, located off of Lumpkin Road to the west of the new National Infantry Museum site, Columbus, GA, improvements have been proposed

including creating additional outdoor classrooms, a series of walking trails, a series of hiking trails, pavilion, and construction (to include dredge and fill) of a 350-slip capacity marina on the Chattahoochee River. Approximate size of the overall project area is 10 to 15 acres (Fort Benning 2005h). Development of a hotel and conference center has also been proposed in this area (Jones 2006).

Chattahoochee River Restoration. In order to restore the historic and natural course of water along a portion of the river that extends from just north of the City of Columbus and down to its most southern edge, Eagle-Phenix Dam and City Mills Dams along the Chattahoochee River would be breeched. The desired outcome is to increase Fall Line shoal fish habitat and recreation (Eubanks and Buckalew 2005). Approximate size of the project area is 2.5 miles (approximately 35 acres).

Tri-State Water Disputes. For more than a decade, the states of Georgia, Alabama, and Florida have been in dispute regarding the withdrawal and use of water from the Apalachicola-Chattahoochee- Flint and Alabama-Coosa-Tallapoosa River basins. The Apalachicola-Chattahoochee- Flint River basin is within the ROI. The Chattahoochee River originates in the Blue Ridge Mountains of the Appalachian Highlands of northeast Georgia, where it flows southwesterly for 120 miles before turning south and flowing approximately 200 miles along the Georgia and Alabama borders, and a small part of the Florida (FL) border. The Flint River includes Blackshear Dam and Lake, Flint River Dam, and Lake Worth. The river originates south of Atlanta, GA, in the Piedmont Province and flows southerly to the upper Coastal Plain, where it joins the Chattahoochee River in Lake Seminole to form the Apalachicola River. The Apalachicola River includes the Corps-operated Jim Woodruff Lock and Dam and Lake Seminole along its length. The river lies entirely within the Coastal Plain along the 180 miles of its length and flows south across northwest FL from GA to Apalachicola Bay in FL. In 1997, Congress ratified two interstate water compacts agreed to by the GA, AL, and FL state legislatures concerning withdrawals of water and public usage from the two river basins. These compacts put litigation on hold and allowed the states to work together to manage the resources; however, the states could not reach an agreement during these compacts and they expired without resolution (in 2003 for the Apalachicola-Chattahoochee- Flint River basin). Active, on going discussions between the states address water supply and allocation at various scales and locations throughout the basin (Upper Chattahoochee Riverkeeper 2006).

Kia Automotive Assembly and Manufacturing Plant. Construction began on a new $1.2 billion automotive assembly and manufacturing plant in early 2007, located in West Point, GA (near LaGrange) about 30 miles north of the Columbus/Phenix City area. The 2.4 million square foot plant will be situated on a site covering nearly 28 million square feet and is scheduled to begin production in 2009 and is expected to produce 300,000 vehicles per year at full capacity. In addition to the expected employment of about 3,000 people, an additional 2,600 employees are expected to be hired at five supplier facilities in GA (Georgia Governor 2006). The supplier facilities are considering locating in the Columbus/Phenix City area. Secondary development is expected within the ROI in the form of retail, commercial, residential-type growth (Jones 2006).

14th Amendment Highway Corridor (also known as Proposed Interstate 14). Section 1927 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users directed the U.S.

Department of Transportation to study two new highway corridors. One links Augusta, GA, Macon, GA, Columbus, GA, Montgomery, AL and Natchez, MS. The other links Savannah, GA, Augusta, GA and Knoxville, TN and is referred to in the statute as the 3rd Infantry Division Highway (also known as Interstate 3). FHWA has not formally designated highways, and uses the term corridors when referring to potential highways since no preferred alignment for these highways has been established. FHWA will study at a minimum the cost of construction and the steps needed to construct highways in both corridors. Determining a cost estimate will require some identification of such factors as alternative locations, the geographic and environmental impacts, and other costs as well, for example, land costs. The statute does not require the FHWA to make a recommendation on whether to build either corridor, and the FHWA does not intend to do so; rather, the studies will be sent to Congress and be available to State, regional, and local decision makers (FHWA 2006).

Columbus Metropolitan Airport Forecast Demand. The Georgia Department of Transportation estimates that the Columbus Metropolitan Airport will grow in terms of aircraft based at the airport and operations. Whereas in 2007, approximately 26 percent of the airport's available annual operating capacity was utilized, it is projected that by 2012, 33 percent of the airport's annual operating capacity would be utilized. In 2021, there would be approximately 169 based aircraft and 65,946 operations at the airport as compared to 2006 when there were approximately 143 based aircraft and 51,591 operations at the airport (Georgia Department of Transportation 2003).

4.16.4 Steps 5 and 6: Characterization of VECs and Their Response to Change

Cumulative impacts analysis steps 5 and 6 characterize the VECs (identified in Steps 1 through 4) carried forward for further analysis in terms of their responses to change and capacity to withstand stresses; and characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

- Land use: As assessed in Section 4.3.2, direct land use impacts can occur as the result of land use conversion through construction, demolition, conservation, or other similar types of action. These impacts typically occur as a result of an agency, entity, or individual taking an action. Indirect impacts can occur as a result of the introduction or manmade uses even when they are removed in time and space. For example, environmental contamination can constrain future use of affected lands and the introduction of noise and safety hazards can make some land uses incompatible.

- Socioeconomics: As assessed in Section 4.5.2, direct socioeconomics impacts occur in the economic sectors experiencing the initial final demand changes would expand, as some establishments increase production and new establishments open. To support their increased output, these sectors would purchase more materials, services, and labor. Indirect effects occur as additional economic sectors would then expand in response to those direct effects. Moreover, these indirectly-affected sectors would make additional purchases, and the industries supporting them would expand to make more purchases, and so on.

- Transportation: As assessed in Section 4.6.2, direct impacts to transportation occur as a result of increased personnel and associated travel on area roadways and use of other transportation infrastructure as well as in the form of disruption to transportation infrastructure during the course of project implementation. Indirect impacts include those that carry over into elements of the transportation system that are geographically removed from the point of initial impact and also can occur as a result of indirect socioeconomic growth and associated impact on transportation systems.
- Noise: As assessed in Section 4.8.2, noise impacts result from a noise-producing activity. Noise impacts are assessed through noise modeling and evaluation of compatibility of given noise exposure levels with sensitive land uses.
- Air quality: As assessed in Section 4.9.2, direct impacts to air resources occur as a result of emission-generating activity. Indirect impacts can result from indirect growth resulting in more emission generating activity (e.g., cars on the road, construction and development activity, etc.)
- Water resources: As assessed in Section 4.11.3, direct impacts to a wide range of water resources will occur as a result of construction and operational impacts. Indirect impacts to water quality, aquatic habitat, and wetlands proximal to the construction and operational areas.
- Biological resources: As assessed in Section 4.13.2.2, direct impacts to a wide range of biological resources will occur as a result of construction and operational impacts. Indirect impacts to water quality, floral and faunal communities proximal to the construction and operational areas, and impacts to conservation measures and resource management elements, such as RCW habitat restoration.

4.16.5 Steps 7 and 8: Baseline Condition and Cause-and Effect Relationships between Human Activities and VECs

Baseline conditions information for VECs is the same as described in the preceding VEC analysis sections listed below for the VECs carried forward in this cumulative impacts analysis:

- Land use and Management: see Section 4.3.1.
- Socioeconomics: see Section 4.5.1
- Transportation: see Section 4.6.1.
- Noise: see Section 4.8.1.
- Air quality: see Section 4.9.1.
- Water Resources: See Section 4.11.1
- Biological resources: see Section 4.13.1.

4.16.6 Step 9: Determination of the Magnitude and Significance of Cumulative Effects on VECs

The magnitude of the effects depends on compiled information on the individual VEC, and the Step 8 results. The significance thresholds in the Chapter 4 resource analysis sections are carried forward for this analysis and are reiterated below for ease of reference followed by the cumulative effects analysis for each resource area.

Land Use and Management

Impacts on land use would be considered significant if one or more of the following occurs within the ROI for any of the action alternatives: 1) the action is incompatible with surrounding land use; 2) the action changes land use in such a way that mission-essential training is degraded; or 3) the action is inconsistent or in conflict with the environmental goals, objectives, or guidelines of a community or county comprehensive plan for the affected area. Land management impacts would be considered significant if the Installation's ITAM and environmental protection procedures were not implemented. All on-Post actions have been planned to not have long-term effects on training land management and operations. Temporary impacts may occur in the construction phase for on-Post development within and proximal to range and training areas. However, long-term disruptions of operations and training would not be expected.

Past and present development has framed the modern land use pattern for the ROI. For Fort Benning, this includes the existing placement of facilities, training areas, infrastructure, and associated circulation patterns. For lands adjacent to Fort Benning, this includes the trend of increasing urbanization resulting in development pressures on the principally rural agricultural lands surrounding the Installation and comprehensive plans addressing the communities' goals and objectives directing growth. There have been long-standing interrelationships between the land use and development throughout the communities associated with Fort Benning and the operations and growth of the Installation. Many of those who are stationed at or work on Fort Benning live outside the Installation. Regardless of where they live; however, most take part in activities in the surrounding communities. Development of schools, utilities infrastructure, neighborhoods, and services are all influenced by this interrelationship.

The ongoing on-Post cantonment area development from other past, present, and future actions, in combination with the Proposed Action, would result in additive impacts in terms of land use intensity and density and interactive impacts in terms of land use functionality. The real property master planning process is the tool to ensure that this growth continues to occur in an orderly fashion, and therefore, no significant cumulative on-Post land use impacts are expected.

When incremental impacts are considered, the impact of ongoing and future growth and urbanization and encroachment in the communities adjacent to and outside of Installation boundaries is a potentially significant impact that could result in degradation of the mission essential training at Fort Benning if left unchecked. The communities surrounding Fort Benning are planning for the anticipated growth expected with the proposed Transformation action, including development of residential areas, schools, and services. The State of Georgia 3,000-ft planning zone is recognized in the comprehensive planning

documents for Muscogee County/Columbus and Chattahoochee County/Cusseta, but additional land use controls are lacking. The implementation of ACUB initiatives and JLUS recommendations are key in ensuring there are no significant encroachment issues. Because the ACUB and JLUS programs are not mandatory, there could be the potential for minor adverse impacts.

If purchasing additional training land is determined to be a feasible and reasonable course of action, these lands would be purchased to address future mission training needs and enhance mission capability. Such a purchase may have the secondary benefit of reducing the concentration of training on existing acreage on Fort Benning thereby promoting RCW survivability and recovery. Feasibility criteria for purchasing additional training lands include cost effectiveness, low population densities of the lands under consideration, accessibility to Fort Benning, environmental land use compatibility with mission requirements, and the willingness of land owners to sell the property. Additional land acquisitions for training purposes would have to undergo their own NEPA analysis.

Socioeconomics

For purposes of this analysis, social and economic changes are considered significant if they fall outside the historical extremes of social and economic change within the ROI; refer to Section 4.5.2 for further definition. As with the ROI under environmental consequences, the ROI for cumulative impacts includes the counties where the Installation is located and those that could potentially be impacted, both directly and indirectly, by past, present, and future actions. This is justified because of the considerable increase in population under the Transformation action and the potential to impact surrounding counties—areas that are considered in past, present, and reasonably foreseeable actions.

Rapid growth in the region is anticipated from these Proposed Actions and other economic growth actions in the area. This would result in increased jobs and expenditures in the ROI. Housing would need to expand in the overall region to support these actions and increased demands for public services such as schools, hospitals, and police/fire departments would need to be met. Cumulative impacts would potentially be significant (but not adverse), as the socioeconomic growth, fueled by these actions, occurs within the ROI.

Transportation

Refer to Section 4.6.2 for detailed threshold information applied here. No significant adverse impact is anticipated if changes to the traffic patterns and LOS do not change or cause an intersection to fail. An intersection is said to have failed when it reaches LOS E or worse. Moderate impacts would occur if changes to the traffic patterns and level of service cause an intersection to perform more poorly as a result of implementing that past, present, or future action in conjunction with what is anticipated under the Preferred Alternative. A drop from LOS A to LOS C or from LOS B to LOS D would be considered moderate. Significant adverse impacts would result if changes to the traffic patterns and level of service would cause an intersection to fail that was not failing under existing conditions. There are two types of areas evaluated for potential cumulative impacts from this Proposed Action with past, present, or future projects: on Post and at entry/exit gates and access points off Post.

Within the Post, the analysis of the No Action Alternative shows that traffic impacts are significant in only a few intersections. Anticipated traffic increases due to past, present, and future projects would represent less than 10 percent of the number of trips generated under the No Action Alternative for three of the four cantonment areas (see Table 4.16-1). All projects approved since 2006 and scheduled for completion through 2013 are included as future projects. In addition, background transportation growth was taken into account. Projects outside of the Fort Benning perimeter were not included in the traffic analysis as they would not result in traffic consequences to the intersections studied.

Table 4.16-1: Trip Generation Comparison – Cumulative versus No Action Alternative

Location		AM Out	PM Out	AM In	PM In
Main Post	Additional Cumulative Trips	382	978	297	879
	No Action Alternative	5,048	12,274	12,532	9,920
	Percent Increase	8%	8%	2%	9%
Kelley Hill	Additional Cumulative Trips	45	242	98	201
	No Action Alternative	326	610	607	577
	Percent Increase	14%	40%	16%	35%
Harmony Church	Additional Cumulative Trips	81	234	142	227
	No Action Alternative	5,441	11,039	10,667	5,955
	Percent Increase	1%	2%	1%	4%
Sand Hill	Additional Cumulative Trips	211	587	122	520
	No Action Alternative	4,600	6,798	4,444	5,931
	Percent Increase	5%	9%	3%	9%

The projects to be implemented by Fort Benning (described in Section 4.6.3) are expected to accommodate these increases in traffic. Therefore, there would be no significant impacts to traffic of the No Action Alternative on Post when incremental impacts are considered with past, present, and future projects.

The No Action Alternative, in combination with additional trips identified (Table 4.16-2), has the potential to have adverse impacts to access points and the off-Post transportation network connected to these points. The best way to indicate where this may occur is to examine increased traffic volumes at the Fort Benning ACPs. If any of the ACPs experience a substantial increase in traffic volumes, it is reasonable to assume that the off-Post transportation network serving the affected ACP would also experience increased traffic volume. The critical time at the ACPs is the AM peak hour when traffic entering the Post is heaviest due to gate security requirements of inspecting identification cards for all drivers and passengers before entering. The traffic forecasts prepared for the No Action Alternative show that the highest volume entering Fort Benning is at the 11th Airborne Division Road ACP in the Sand Hill cantonment area where traffic at the AM peak hour is 946 vehicles (see Table 4.16-2). To process these vehicles, up to two security personnel per lane and three lanes at the 11th Airborne Division Road ACP would be required. Additionally, the ACP design and its location would need to be such that there is enough room for vehicle storage in case some unexpected queuing occurs at the gate. This is particularly true in areas close to intersections or highway ramps.

Table 4.16-2: Traffic at Two ACPs under the No Action and Action Alternatives

	AM		PM	
Custer/Fort Benning Blvd	**Northbound**	**Southbound***	**Northbound**	**Southbound***
Existing	137	575	562	101
No-Action	145	634	597	107
Growth Rate vs. Existing	1.1%	2.0%	1.2%	1.2%
Action Alternative (A or B)	209	731	661	203
Growth Rate vs. Existing	8.8%	4.9%	3.3%	15.0%
	AM		**PM**	
11th/187th	**Eastbound***	**Westbound**	**Eastbound***	**Westbound**
Existing	495	198	124	324
No-Action	525	211	132	344
Growth Rate vs. Existing	1.2%	1.3%	1.3%	1.2%
Action Alternative (A or B)	946	503	553	637
Growth Rate vs. Existing	13.8%	20.5%	34.9%	14.5%

Note: *Indicates entering traffic to a cantonment area.

These estimates applied a processing rate of 1,170 vehicles per hour (390 vehicles/hr/lane) for a mix of 70 percent decaled and 30 percent non-decaled vehicles, and a medium processing rate[1].

The access roads leading to the Sand Hill cantonment area, mainly U.S. Highway 27/280, are considered to have enough capacity, according to conversations with the consultants working on the Fort Benning Comprehensive Transportation Study and personnel at the Installation (USACE 2007a). The Main Post has several access roads and the increased traffic would not be concentrated on a single place. At the ACP on Custer and Fort Benning Boulevard, the increase is moderate and the road would be able to handle it without major disruptions.

With implementation of the transportation mitigations included in the BRAC/Transformation EIS, it is not anticipated that there would be significant cumulative impacts that are adverse when incremental impacts are considered with past, present, or future actions.

In addition, the analysis of the Preferred Alternative shows that 37 projects would produce negligible traffic, 9 projects would produce limited traffic, and 0 projects would produce measurable traffic. As such, the LOS of the 30 key intersections for the No Action and Preferred Alternatives would not significantly differ. In addition, anticipated traffic increases due to past, present, and future projects would not alter from the cumulative impacts analyzed in the BRAC/Transformation EIS. Therefore, the mitigation measures outlined in the BRAC/Transformation EIS for each cantonment area (Main Post, Kelley Hill, Harmony Church, and Sand Hill) would be sufficient to accommodate the traffic generation related to Preferred Alternative. No further mitigation would be necessary as a result of the Proposed Actions.

[1] Taking into consideration processing rates estimated by the Military Traffic Management Command (MTMC) for 100 percent DoD-decaled vehicles and an estimate made by STV Incorporated (STV 2003) for 100 percent non-decaled vehicles at Fort Benning, GA for a specific number of security personnel and three processing scenarios (i.e., low, medium, and high).

Noise

The threshold level of significant impacts for noise is:

1) The increase of any Zone III (incompatible) noise contours where there are sensitive noise receptors (residences, hospitals, libraries, and etc.) due to operations. This threshold is intended to capture areas where there would be "high annoyance" effects from operational noise, alongside health effects and complaints.

2) Construction noise resulting in an hourly equivalent sound level of 75 dBA (based on USEPA data for construction noise) at a sensitive receptor (such noise exposure would be equivalent to noise Zone III) or consistent exposure to noise levels at 85 dBA, over an 8 hour period, the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (NIOSH 2006).

Off-Post noise generators (e.g., cars, trucks, construction activity, and airplanes from the city airport) would need to increase considerably to make a substantial change in the noise environment. There is the potential for increased noise impacts due to the related growth anticipated to occur with the MCOE actions. Off-Post Zone III noise contours may expand in some off-Post locations from projected conditions as a result of range activities. Encroachment in the areas surrounding Fort Benning could increase the number of new sensitive receptors and incompatible land uses within noise zones and there is a potential for increased noise complaints. However, continued implementation of ACUB and JLUS initiatives would offset these impacts. It is not possible to foresee if the degree that impacts would be offset, but it is reasonable to assume that there would be successes with these programs given the progress to date.

Air Quality

Air quality impacts would be significant if emissions associated with the Proposed Action would: 1) increase ambient air pollution concentrations above the NAAQS, 2) contribute to an existing violation of the NAAQS, 3) interfere with, or delay timely attainment of the NAAQS, 4) impair visibility within federally-mandated PSD Class I areas, or 5) result in the potential for any stationary source to be considered a major source of emissions as defined in 40 CFR 52.21 (total emissions of any pollutant subject to regulation under the CAA greater than 250 tpy for attainment areas).

Increasing economic development and urbanization would increase air emissions within the ROI and be additive to the emissions from the Proposed Action. Cumulative impacts would potentially reach significant levels, particularly as these incremental impacts relate to attainment of the NAAQS.

Biological Resources

Impacts on biological resources would be considered significant if one of more of the following conditions would result: 1) Substantial loss or degradation of habitat or ecosystem functions (natural features and processes) essential to the persistence of native plant and animal populations; 2) Substantial loss or degradation of a sensitive habitat, including wetlands and UEAs that support high concentrations

of special status species or migratory birds; 3) Disruption of a federally listed species, its normal behavior patterns, or its habitat that substantially impedes the Installation's ability to either avoid jeopardy or conserve and recover the species; or 4) Substantial loss of population or habitat for a state-protected or non-listed but special status species, increasing the likelihood of federal listing action to protect the species in the future.

The definition of "substantial" is dependent on the species and habitats in question and the regional context in which the impact would occur. Impacts may be considered more adverse if the action affects previously undisturbed habitat or if the impact would occur over a large portion of available habitat in the region. The impact to the RCW by the proposed action on a cumulatives basis was determined to be significant as it was considered likely to jeopardize this species.

The USFWS in preparation of its BO and determination of a Jeopardy Opinion considered the impacts of all Federal, State, and private actions that have undergone formal Section 7 consultation up to time of the issuance of the BO. The BO considered on-going and future activities by Fort Benning to protect listed species such as the ACUB program. In its determination that the proposed action would jeopardize the existence of the RCW, the USFWS considered the RCW population at Fort Benning at its current levels and the modeled levels of the population into the future under a number of scenarios. Combined with the population recovery trends elsewhere in the United States, the determination was made that the proposed action was likely to jeopardize the RCW in part due to long term cumulative effects. Implementation of the RPA for Alternative A along with the mandatory RPMs, Incidental Take Statement and Terms and Conditions would allow Alternative A to avoid the cumulative impacts that would otherwise occur resulting in jeopardy to the RCW. Under Alternative A, it was the opinion of the USFWS that Fort Benning would have the ability to avoid jeopardy if the BA, BO, and RPA terms are implemented; however, the ultimate recovery of the RCW would be delayed. Alternative B would result in greater cumulative impacts and would affect the regional population of this species and the population as a whole to the point of likely jeopardy.

Cumulative impacts to vegetation, wildlife, protected species, and UEAs may occur due to the aggregate of additional habitat disturbance from increased human population, supplemental training ranges, additional housing, commercial areas, roads, and recreational facilities in the region from projects in the past, present, and foreseeable future. These impacts would be reduced by the implementation of Alternative A due to the reduction of the overall amount of total area disturbed when compared to Alternative A. The impacts would be dispersed in time and place, but would have a collective effect in changing the native landscape at Fort Benning and surrounding region. The implementation of the Proposed Action would increase the population of the region, leading to new facilities both on and off the Installation. Economic growth in the area increases urbanization which would disturb and fragment habitat surrounding Fort Benning. Disturbance and clearing of the longleaf pine ecosystem may impact sensitive plant species and reduce available habitat for sensitive wildlife such as RCW and gopher tortoise. Habitat fragmentation may affect reproduction, dispersal, and migration of these and other species.

Implementation of ACUB initiatives could potentially offset some but not all of the impacts for biological resources, including special status species. The protection of key habitat areas adjacent to Fort Benning would potentially result in contiguous corridors for special status species protection. Specifically, the Fall Line habitat protection and restoration areas may extend out along the northeastern boundary of the Installation as much as 10 miles. The ACUB program would manage these lands to secure viability of gopher tortoise and relict trillium populations off Post, as well as other associated rare species and wetlands; and to provide future habitat for RCW. Mature pine habitat protection and restoration, extending westward into Alabama providing similar Fall Line habitat, would provide the best chance at providing near-term RCW restoration and protection off Post by linking existing habitat. The restoration and protection of pine uplands and riverine systems southward along the Chattahoochee River offer similar potential for RCW restoration linked with existing habitat (TNC 2006). Fort Benning's participation in the RCW donor population program is evaluated in the BA (accessible at the aforementioned Army website), subsequent addenda, and in the Final BO attached in Appendix F.

Water Resources

When incremental impacts to water resources are considered, The Chattahoochee River Restoration project is expected to have a beneficial effect on biological resources after an initial period of increased turbidity and sedimentation. Other construction projects and the overall increase in impervious surfaces are likely to increase the sediment load in Fall Line streams, which are sensitive to erosion from unstable soils. The individual effects of each project would be controlled and permitted as required, but cumulative impacts to stream ecosystems may occur. Sedimentation and changes in flow rate could affect fish and other aquatic species.

Cumulative impacts to aquatic habitats and wetlands may occur due to the aggregate of additional habitat disturbance from increased human population, supplemental training ranges, additional housing, commercial areas, roads, and recreational facilities in the region from projects in the past, present, and foreseeable future. These impacts would be reduced by the implementation of Alternative A due to the reduction of the overall amount of total area disturbed when compared to Alternative A. The impacts would be dispersed in time and place, but would have a collective effect in changing the native landscape at Fort Benning and surrounding region.

4.16.7 Steps 10 and 11: Mitigation and Monitoring

No mitigation and monitoring requirements for cumulative impacts were identified as a result of this cumulative impacts analysis.

In summary, the Army has employed a stepwise process to evaluate the potential for cumulative impacts. This process considered the aggregate effects of past, present, and foreseeable future actions. Of the VECs considered, the cumulative effects on all five Biological Resources subcategories have the potential for significant adverse effects. The measures deemed necessary to maximize control and minimize these effects to RCWs have been addressed through coordination via the BA and supplemental addenda to the BA and ultimately with the issuance of the BO by the USFWS which are applicable to Alternative A

only. Conversely, the cumulative impacts relative to socioeconomics will be significantly beneficial for all alternatives. With regard to Land Use, on-Post land use cumulative effects are not expected to be significant but careful off-Post management of development will be necessary to avoid offsite significant adverse encroachments impacts. None of the remaining VECs have been determined to have an expected level of significant impact to the Post or the surrounding region.

4.17 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

4.17.1 Irreversible and Irretrievable Commitments Identified

An irreversible/irretrievable commitment of resources results from a decision to use or modify resources when they are renewable only over a long period of time, such as soil productivity, or when they are nonrenewable resources, such as cultural resources. The single most irreversible and irretrievable commitment of resources associated with the Proposed Action is the loss of forested lands for the projects associated with the training range improvements and alterations, including support facilities, access roads, as well as training roads and tank trails. It is considered an irreversible commitment because, for the foreseeable future, this area will be used for training and ranges and re-establishing it as a forest is not reasonable for quite some time. Some wetland areas and vegetation will be permanently lost due to construction; in addition, there is a potential for the displacement of wildlife or the loss of protected species and their habitat. Although these actual resources will be lost, through design, management, and mitigation efforts, much of the impacts will be offset or minimized.

The materials and energy required for construction, operation, and maintenance activities associated with the Proposed Action, particularly range improvements and training operations, also represent irretrievable commitments of resources. The total amount of materials required for construction of the Proposed Action is relatively insignificant when compared to the construction resources available in the region. The energy used for construction consists of the fuels necessary to operate heavy equipment and trucks. Although energy conservation is a vital and critical issue, the energy resource commitment to the Proposed Action is not anticipated to be excessive in terms of region-wide usage. Materials and energy are not in short supply and their use would not have a significant effect upon continued availability of these resources. Construction, operation, and maintenance would also require a substantial expenditure of federal funds that would not be directly retrievable.

4.17.2 Unavoidable Adverse Effects

The environmental analysis of the alternatives includes the avoidance, minimization, or other mitigation of potential adverse effects on natural, cultural, and environmental resources; however, all adverse impacts may not be completely avoided and/or mitigated. Some adverse effects would be temporary in nature; for example, there would be short-term minor adverse effects to air quality due to construction vehicle emissions and the ongoing use of prescribed fire for habitat management. Other adverse effects could be long-term in nature; for example, the removal of protected species habitat due to land-clearing activities for construction and subsequent operations and training by mechanized vehicles.

Current noise impacts near the Installation boundary would continue and not be readily avoided or completely mitigated. Operations within training areas and ranges would continue to result in operational noise generation. Continued communication with the public, however, will help address operational noise concerns. Programs to discourage or avoid incompatible land uses (e.g., ACUB and the JLUS programs)

may minimize noise impacts to the community. Any mitigation measures identified in the future will be considered to mitigate the unavoidable adverse effects that have been identified in this EIS.

4.17.3 Unavoidable Effects to Global Warming

The greenhouse effect is the result of heat absorption by certain gases in the atmosphere (called greenhouse gases (GHG) because they effectively 'trap' heat in the lower atmosphere) and re-radiation downward of some of that heat. Water vapor is the most abundant greenhouse gas, followed by carbon dioxide and other trace gases. Human activity has been increasing the concentration of greenhouse gases in the atmosphere (mostly carbon dioxide from combustion of coal, oil, and gas; plus a few other trace gases). The global concentration of CO_2 in our atmosphere today far exceeds the natural range over the last 650,000 years. Global surface temperatures have increased about 0.74° celsius (C) (plus or minus 0.18°C) since the late 19th century, and the linear trend for the past 50 years of 0.13°C (plus or minus 0.03°C) per decade is nearly twice that for the past 100 years (NOAA 2009).

The Proposed Action would emit greenhouse gases to the earth's atmosphere from vehicles and other associated emissions at Fort Benning. The Proposed Action would also remove some trees which could otherwise absorb carbon dioxide. Cumulatively, the Proposed Action and the Transformation/BRAC actions could result in an increase in carbon dioxide emissions due to reductions in forest cover, additional energy generation associated with energy service to additional buildings, and additional vehicles at the installation. Nonetheless, only some of these cumulative emissions would represent a net increase in global greenhouse gas emissions, as many of these emissions already take place and are merely relocating to Fort Benning. Most of the new emissions are associated with the Armor School coming to Fort Benning. But the Armor school currently conducts virtually the same program of instruction with the same vehicles at Fort Knox, Kentucky. Those emissions will cease at Fort Knox as they resume at Fort Benning. Therefore, the net change to GHG concentration, in a regional or global context, is virtually unchanged.

It is also important to place any potential carbon emissions associated with the Proposed Action in the context of Fort Benning's participation in the federal government's overall plan to reduce carbon emissions. EO 13423 sets as a goal for all federal agencies the improvement in energy efficiency and the reduction of green house gas (GHG) emissions of the agency, through reduction of energy intensity by: (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline to the agency's energy use in FY03. The U.S. Army Energy Strategy for Installations (DoD 2005b) also contains strategies to reduce energy waste and improve efficiency.

According to EPA's Office of Air and Radiation:

> To date, research on how emissions of CO_2 and other GHGs influence global climate change and associated effects has focused on the overall impact of emissions from aggregate regional or global sources. This is primarily because GHG emissions from single sources are small relative to aggregate emissions, and GHGs, once emitted from a given source, become well mixed in the global atmosphere and have a long atmospheric

> lifetime. The climate change research community has not yet developed tools specifically intended for evaluating or quantifying end-point impacts attributable to the emissions of GHGs from a single source, and [EPA is] not aware of any scientific literature to draw from regarding the climate effects of individual, facility-level GHG emissions.(Meyers 2008b).

Current measurements and modeling can observe and verify warming at global to continental scales. Climate, and correspondingly environmental, impacts, are observed on a local level, but cannot be modeled at this time using existing models. It is currently beyond the scope of existing science to connect a specific source of GHG emissions with specific climate impacts at an exact location (Meyers 2008a).

Based on the limitations on available science in determining environmental impacts from a single source of additional GHG emissions, any such impacts from the Proposed Action cannot be determined with scientific confidence.

CHAPTER 5

LIST OF PREPARERS

5.0 LIST OF PREPARERS

U.S. Army Corps of Engineers, Mobile District

Name	Title	Education/Responsibility	Experience
Julie Morgan	BRAC NEPA Support Team – Project Manager	B.A., Anthropology, MA Historical Administration. Responsible for the overall management of the BRAC NEPA document preparation	15 years

The Louis Berger Group, Inc.

Name	Title	Education/Responsibility	Experience
Rebecca Byron	Environmental Scientist	B.S. Environmental Policy and Politics. Responsible for document production	3 years
Jill Cavanaugh, AIA Associate	Architect/Planner	B.A., Architecture, M.S. Architecture and Urban Design. Responsible for Aesthetics and Visual Resources	9 years
Jess Commerford, AICP	Senior Vice President	B.G.S., Political Science, M.S. Urban and Regional Planning. Responsible for all sections	18 years
Pauline Dachman	Environmental Scientist	B.S. Environmental Policy and Politics. Contributing to Socioeconomics	1 year
Alan Karnovitz	Senior Economist	B.S. Natural Resource Science M.P.P. Public Policy. Responsible for Socioeconomics	26 years
Michael Monteleone, AICP	Transportation Planner	B.A. Geography, M.R.P., City and Regional Planning. Responsible for Transportation	21 years
Catherine Price	Senior Environmental Engineer	B.S. Chemistry, B. S. Chemical Engineering. Responsible for Project Management	27 years
Josh Schnabel	Environmental Planner	M.S. Geography and Natural Resource Management., Responsible for Geology and Soils	6 years

TEC Inc.

Name	Title	Education/Responsibility	Experience
Stephen Berry	Senior Analyst Technical Editor	B.S., Environmental Engineering, B.S. Ecology/ Chemistry. Responsible for Water Resources	29 years
Dan Broockmann	Cultural Resources Environmental Analyst	M.A. University of Arizona B.A. Binghamton University. Responsible for Cultural Resources	5 years
James Campe	Senior Environmental Analyst	B.S., Naval Architecture and Offshore Engineering. Responsible for Safety	19 years
Cathy Doan	Environmental Analyst	B.S., English, MA Human Resources Development. Responsible for Utilities	11 years
Mike Dungan	Senior Environmental Analyst	Ph.D., Ecology and Evolutionary Biology. Responsible for Biological Resources	27 years
Lucas DuPont	Environmental Analyst	B.A. English/Environmental Science. Contributing to Land Use	4 years
Emily Ferguson	Environmental Analyst	B.A. Public and Urban Affairs. Responsible for technical editing	1 year
Ellen Graap-Loth	Senior Environmental Analyst	B.S., Natural Resources. Responsible for Hazardous and Toxic Substances and Wastes	18 years
Lesley Hamilton	Senior Environmental Analyst	B.A., Chemistry. Responsible for Air Quality	18 years
Mary Harclerode	Production	A.A. Business Administration. Responsible for production	2 years
Rachel Healey	Environmental Analyst	B.S. Biology, MBA Assisting in Biological Resources	5 years
Edie Mertz	Graphics Specialist	A.A., General Education. Responsible for Graphics	14 years
William C. Palmer	GIS Specialist and Planner	B.A. Economics, M.A. Urban and Environmental Planning. Responsible for GIS	6 years
Kathy L. Rose	Manager and Senior Environmental Analyst	B.A. Political Science/German, M.A. International Relations, M.S. Forest Resource Management. TEC EIS project manager responsible for DOPAA, TEC resource sections, and QA/QC	15 years
Teresa Rudolph	Cultural Resource Senior Analyst	B.A./M.A., Anthropology. Lead for Cultural Resources	28 years
Carol Wirth	Senior Planner	B.S. Ecology and Evolutionary Biology. Responsible for Land Use and Cumulative Effects	13 years
Asher A. Williams	Environmental Analyst	B.S. Environmental Science. Assisted with Water Resources	1 year

CHAPTER 6

NOTIFICATION LIST

Federal-State Agencies							
First	Last	Title	Organization	Address	City	State	Zip Code
			Columbus Consolidated Government Planning Division	100 10th St., 6th Floor, Government Center Tower	Columbus	GA	31902
			Columbus/Muscogee County Soil Conservation Service	100 10th St., 6th Floor, Government Center Tower	Columbus	GA	31993
Tom	Fisher	Albany Field District	USACE	1104 North Westover Rd.	Albany	GA	31707
Gregory	Hogue	Regional Environmental Officer	USDI, Office of Environmental Policy & Compliance	Russell Federal Building, Suite 1144, 75 Spring Street, S.W.	Atlanta	GA	30303
		Director	USDI, Office of Environmental Policy & Compliance	(MS:2462), Main Interior Bldg., 1849 C Street, NW	Washington	DC	20240
A. Stanley	Meiberg	Administrator, Region IV	USEPA	61 Forsyth Street S.W.	Atlanta	GA	30303
Bob	Lord	Region IV, Wetland Section	USEPA	61 Forsyth Street S.W.	Atlanta	GA	30303
Edward	Kertis	Commander, Savannah District	USACE	Post Office Box 889	Savannah	GA	31402
James D.	Giattina	Director, Water Management Division	USEPA	61 Forsyth Street S.W.	Atlanta	GA	30303
		Soil Conservation Service	USDA	Post Office Box 18	Buena Vista	GA	31803
Ben	Mosely	Region 5 Representative	Georgia Soil and Water Conservation Commission	4344 Albany Highway	Dawson	GA	39842
Barbara	Jackson		Georgia State Clearinghouse	270 Washington Street, SW., 8th Floor	Atlanta	GA	30334
M. Barnett	Lawley	Commissioner of Conservation	AL Department of Conservation and Natural Resources	64 N. Union Street	Montgomery	AL	36130
		Alabama State Historic Preservation Officer	Alabama Historic Commission	468 South Perry Street	Montgomery	AL	36130
Ray	Luce	Director, Historic Preservation Division	GA DNR	34 Peachtree Street, N.W., Suite 1600	Atlanta	GA	30303
John	Doresky	Fort Benning Field Office	USFWS	P.O. Box 52560	Fort Benning	GA	31995
		RCW Recovery Coordinator	USFWS	261 Lehotsky Hall	Clemson	SC	29634
Dr. Carol A.	Couch	Director	Georgia EPD	2 Martin Luther King Jr. Dr., SE, Suite 1152 East	Atlanta	GA	30334
Noel	Holcom	Commissioner	Georgia DNR	2 Martin Luther King Jr. Dr., SE, Suite 1252 East	Atlanta	GA	30334
Linda	MacGregor	Branch Chief	GA EPD	4220 International Pkwy, Suite 101	Atlanta	GA	30354
Becky	Kelley	Director	Parks, Recreation and Historic Sites Division, GA DNR	2 Martin Luther King Jr. Dr., SE, Suite 1352	Atlanta	GA	30334

Elected Officials						
Agency	**First**	**Last**	**Address**	**City**	**State**	**Zip Code**
Alabama Governor	Bob	Riley	600 Dexter Avenue	Montgomery	AL	36130
Alabama, 28th State Senate District	Myron C.	Penn	11 S. Union Street Room 731	Montgomery	AL	36130
Alabama, 79th House District	Mike	Hubbard	11 S. Union Street Room 536-A	Montgomery	AL	36130
Alabama, 80th State House District	Lesley	Vance	11 S. Union Street Room 630-E	Montgomery	AL	36130
Alabama, 81st State House District	Betty Carol	Graham	11 S. Union Street Room 531	Montgomery	AL	36130
Alabama, 82nd State House District	Pebblin W.	Warren	11 S. Union Street Room 532-C	Montgomery	AL	36130
Alabama, 83rd State House District	George	Bandy	11 S. Union Street Room 529	Montgomery	AL	36130
Alabama, 84th State House District	Billy	Beasley	11 S. Union Street Room 625-A	Montgomery	AL	36130
Alabama, U.S. House of Representatives, 3rd District	Mike	Rogers	324 Cannon HOB	Washington	DC	20515
Alabama, U.S. Senate	Jeff	Sessions	335 Russell Senate Office Building	Washington	DC	20510
Alabama, U.S. Senate	Richard	Shelby	110 Hart Senate Office Building	Washington	DC	20510
Board of Commissioners, Cusseta, GA	Larry	Dillard	P.O. Box 299	Cusseta	GA	31805
Board of Commissioners, Russell County, AL	Cattie	Epps	P.O. Box 969 County Courthouse	Phenix City	AL	36868
Chairman, Marion County	Myron	Well	240 Cool Springs Road	Buena Vista	GA	31803
Georgia Governor	Sonny	Perdue	Office of the Governor, Georgia State Capitol	Atlanta	GA	30334
Georgia State House District 129	Vance	Smith, Jr.	P.O. Box 171	Pine Mountain	GA	31822
Georgia State House District 130	Debbie	Buckner	780 Fielder's Mill Road	Junction City	GA	31812
Georgia State House District 131	Richard	Smith	P.O. Box 2122	Columbus	GA	31902
Georgia State House District 132	Calvin	Smyre	P.O. Box 181	Columbus	GA	31902
Georgia State House District 133	Carolyn	Hugley	P.O. Box 6342	Columbus	GA	31917
Georgia State Senate District 14	George	Hooks	P.O. Box 928	Americus	GA	31709

Elected Officials						
Agency	First	Last	Address	City	State	Zip Code
Georgia State Senate District 15	Ed	Harbison	P.O. Box 1292	Columbus	GA	31902
Georgia State Senate District 29	Seth	Harp	P.O. Box 363	Midland	GA	31820
Georgia, State House District 135	Lynmore	James	114 Walnut Street	Montezuma	GA	31063
Georgia, State House District 148	Bob	Hanner	9610 Plains Highway	Parrott	GA	39877
Georgia, U.S. House of Representatives, 10th District	Paul	Broun	325 Cannon HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 11th District	Phil	Gingrey, M.D.	119 Cannon HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 12th District	John	Barron	226 Cannon HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 13th District	David	Scott	417 Cannon HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 1st District	Jack	Kingston	2368 Rayburn HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 2nd District	Sanford	Bishop, Jr	2429 Rayburn HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 3rd District	Jim	Marshall	515 Cannon, HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 4th District	Hank	Johnson	1133 Longworth HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 5th District	John	Lewis	343 Cannon HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 6th District	Tom	Price	424 Cannon HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 7th District	John	Linder	1026 Longworth HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 8th District	Lynn	Westmorland	1213 Longworth HOB	Washington	DC	20515
Georgia, U.S. House of Representatives, 9th District	Nathan	Deal	2133 Rayburn HOB	Washington	DC	20515
Georgia, U.S. Senate	Saxby	Chambliss	416 Russell Senate Office Bldg.	Washington	DC	20510
Georgia, U.S. Senate	Johnny	Isakson	120 Russell Senate Office Bldg	Washington	DC	20510
Marion County Commission	Ronald	Graham	P.O. Box 481	Buena Vista	GA	31803
Marion County Commission	George	Neal	240 Cool Springs Road	Buena Vista	GA	31803
	Ralph	Brown	P.O. Box 158	Buena Vista	GA	31803
Mayor of Phenix City, Alabama	Sonny	Coulter	601 12th Street	Phenix City	AL	36867
	Jerry	Hays	P.O. Box 481	Buena Vista	GA	31803
	Julius	Hunter, Jr	139 Whippoorwill Lane	Columbus	GA	31906
Mayor of Columbus, Georgia	Jim	Wetherington	100 10th St., 6th Floor, Government Center Tower	Columbus	GA	31901
City Manager, Phenix City, Alabama	Wallace	Hunter	601 12th Street	Phenix City	AL	36867
	Evelyn	Turner Pugh	325 Jefferson Drive	Columbus	GA	31907

American Indian Tribal Representatives							
First	Last	Title	Organization	Address	City	State	Zip Code
Carlos	Bullock	Tribal Historic Preservation Officer	Alabama/Cousatta Tribe of Texas	571 State Park Road 56	Livingston	TX	77351
Joanne	Battis	Chairperson	Alabama/Cousatta Tribe of Texas	571 State Park Road 56	Livingston	TX	77351
Augustine	Asbury	Representative	Alabama/Quassarte Tribe of Oklahoma	P.O. Box 187 117 North Main Street	Wetumka	OK	74880
Tarpie	Yargee	Chief	Alabama/Quassarte Tribe of Oklahoma	P.O. Box 187 117 North Main Street	Wetumka	OK	74880
Gingy	Nail	Director of Cultural Resources	Chickasaw Nation	126 North Oak Street	Ada	OK	74821
Bill	Anoatubby	Governor	Chickasaw Nation	126 North Oak Street	Ada	OK	74821
Jennie	Lillard	Representative	Kialegee Tribal Town	P.O. Box 332 108 N. Main Street	Wetumka	OK	74883
Gary	Bucktrot	Mekko	Kialegee Tribal Town	P.O. Box 332 108 N. Main Street	Wetumka	OK	74883
Ken	Carleton	Tribal Historic Preservation Officer	Mississippi Band of the Choctow Indians	P.O. Box 6010, 101 Industrial Road	Choctaw	MS	39350
Phillip	Martin	Chief	Mississippi Band of the Choctow Indians	P.O. Box 6010, 101 Industrial Road	Choctaw	MS	39350
Joyce	Bear	Preservation Officer	Muscogee (Creek) Nation of Oklahoma	P.O. Box 580 HWY 75 & Loop 56	Okmulgee	OK	74447
A.D.	Ellis	Principal Chief	Muscogee (Creek) Nation of Oklahoma	P.O. Box 580 HWY 75 & Loop 56	Okmulgee	OK	74447
Robert	Thrower	Representative	Poarch Band of Creek Indians	HCR 69A, Box 85B 5811 Jack Springs Road	Atmore	AL	36502
Buford	Rolin	Chairman	Poarch Band of Creek Indians	HCR 69A, Box 85B 5811 Jack Springs Road	Atmore	AL	36502
Pare	Bowlegs	Historic Preservation Officer	Seminole Nation of Oklahoma	P.O. Box 1498	Wewoka	OK	74884
Kelly	Haney	Principal Chief	Seminole Nation of Oklahoma	P.O. Box 1498	Wewoka	OK	74884
Willard	Steele	Deputy Tribal Historic Preservation Officer	Seminole Tribe of Florida	AH-THA-THI-KI Museum HC-61, Box 21A	Clewiston	FL	33440
Mitchell	Cypress	Chairman	Seminole Tribe of Florida	AH-THA-THI-KI Museum HC-61, Box 21A	Clewiston	FL	33440
Charles	Coleman	Representative	Thlopthlocco Tribal Town	Route 1, Box 190A	Weleetka	OK	74880
Vernon	Yarholar	Town King	Thlopthlocco Tribal Town	Route 1, Box 190A	Weleetka	OK	74880
George	Wickliffe	Chief	United Keetoowah Band of the Cherokee Indians in Oklahoma	P.O. Box 746, 18771 West Keetoowah Circle	Park Hill	OK	74464
Lisa	Stopp	Representative	United Keetoowah Band of the Cherokee Indians in Oklahoma	P.O. Box 746, 18771 West Keetoowah Circle	Park Hill	OK	74464

Interest Groups						
First	Last	Organization	Address	City	State	Zip Code
		Audobon Society of Columbus	P.O. Box 442	Hamilton	GA	31811
		Chattahoochee Nature Center	9135 Willeo Road	Roswell	GA	30075
		Chattahoochee RiverWatch	30 W. 10th Street P.O. Box 1492	Columbus	GA	31909
Gary	Jones	Columbus Chamber of Commerce	901 Front Ave	Columbus	GA	31901
Frank	Schnell	Columbus Museum	1251 Wynnton Road	Columbus	GA	31906
Dick	Ellis	Community and Economic Development/ Columbus Consolidated Government	100 10th St., 6th Floor, Government Center Tower	Columbus	GA	31809
		Georgia Bass Chapter Federation	11575 Northgate Trail	Roswell	GA	30075
E.J.	Williams	Georgia DNR	116 Rum Creek Drive	Forsyth	GA	31029
Claude	Yearwood	Georgia Forestry Association, Inc	505 Pinnacle Court	Norcross	GA	30071
		Georgia Trappers Association, Inc	Rural Route 1, Box 204A	Lutherville	GA	30251
Greg	Paxton	Georgia Trust for Historic Preservation	1516 Peachtree Street, NW	Atlanta	GA	30309
		Georgia Wildlife Federation	11600 Hazelbrand Road	Covington	GA	30014
		Georgia Woman Flyfishers	116 Kenninghall Ct.	Smyrna	GA	30082
Mike	Gaymon	Greater Columbus Chamber of Commerce	1200 Sixth Avenue	Columbus	GA	31902
		National Wildlife Society	1401 Peachtree Street N.E. Suite 240	Atlanta	GA	30309
Victor	Cross	Phenix City-Russell County Chamber of Commerce, President	1107 Broad Street	Phenix City	AL	36887
		Sierra Club, Georgia Chapter	1447 Peachtree Street N.E. Suite 305	Atlanta	GA	30309
		The Georgia Conservancy, Inc	1776 Peachtree St., NW St. 400 South Tower	Atlanta	GA	30309
		The Nature Conservancy	303 12th Street, Chattahoochee Fall Line Office	Columbus	GA	31901
Laurel	Moore-Barnhill	USDA Forest Service, Savannah River	P.O. Box 700	New Ellenton	SC	29809
		Wildlife Society, Georgia Chapter	2150 Dawnsonville Highway	Gainesville	GA	30501
Wade	Harrison	The Nature Conservancy, Chattahoochee Fall Line Project Director	P.O. Box 52452	Fort Benning	GA	31995

Repositories				
Organization	**Address**	**City**	**State**	**Zip Code**
Chattahoochee Valley Regional Library	1120 Bradley Drive	Columbus	GA	31906
Columbus Public Library	3000 Macon Road	Columbus	GA	31906
Fort Benning Main Post Library	Building 93	Fort Benning	GA	31905
Harris County Public Library	138 N. College St.	Hamilton	GA	31811
Phenix City Public Library	1501 17th Ave.	Phenix City	AL	36867
Richland Public Library	112 Wall St	Richland	GA	31825
South Columbus Branch Library	2034 South Lumpkin Road	Columbus	GA	31903
Hardin County Public Library	800 South Logsdon Parkway	Radcliff	KY	40160

Media Points of Contact				
Organization	**Address**	**City**	**State**	**Zip Code**
WRBL TV 3 (CBS)	1350 13th Avenue	Columbus	GA	31901
WKCN (99.3 FM)	1253 13th Avenue	Columbus	GA	31901
WTVM TV 9 (ABC)	1909 Wynnton Road	Columbus	GA	31994
WGSY (100 FM)	1501 13th Avenue	Columbus	GA	31901
WXTX TV 54 (FOX)	6524 Buena Vista Road	Columbus	GA	31994
WOKS (1340 AM) and WXFE (105 FM)	P.O. Box 1998	Columbus	GA	31902
Columbus Ledger-Enquirer	P.O. Box 830	Columbus	GA	31902
The Bayonet	1819 S. Lumpkin Rd.	Fort Benning	GA	31903
Tri-County Journal & Chattahoochee Chronicle	P.O. Box 850, 71 Webb Lane	Buena Vista	GA	31803
Mellow Times News	2904 Macon Road	Columbus	GA	31907
The News-Enterprise	408 West Dixie Ave.	Elizabethtown	KY	42701

CHAPTER 7

REFERENCES CITED

7.0 REFERENCES CITED

29 Code of Federal Regulations (CFR) Part 1910.1200. Hazard Communication. Accessible at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10099

32 CFR Part 651. Environmental Analysis of Army Actions. Accessible at: http://www.access.gpo.gov/nara/cfr/waisidx_01/32cfr651_01.html.

33 CFR Part 328.3. Definition of Waters of the United States. Accessible at: http://www.usace.army.mil/cw/cecwo/reg/33cfr328.htm#328.3

36 CFR Part 800. Protection of Historic Properties. Accessible at: http://www.achp.gov/regs-rev04.pdf

40 CFR Part 50. Protection of the Environment. Chapter I. Environmental Protection Agency. Subchapter C. Air Programs. National Primary and Secondary Ambient Air Quality Standards. Part 59. Subpart D. National Volatile Organic Compound Emission Standards for Architectural Coatings. Table 1. VOC Content Limits by Product Category. Part 93.153. Determining Conformity of Federal Actions to State or Federal Implementation Plans. Subpart B. Determining Conformity of General Federal Actions to State or Federal Implementation Plans. Applicability.

40 CFR Part 112. Protection of the Environment. Chapter I. Environmental Protection Agency. Subchapter D. Water Programs. Oil Pollution Prevention. Part 112. Accessible at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=6ec590f3109b7a667259e216e6dff268&rgn=div5&view=text&node=40:21.0.1.1.7&idno=40

40 CFR Parts 1500 to 1508. Council on Environmental Quality (CEQ) - Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA). Accessible at: http://ceq.eh.doe.gov/nepa/regs/ceq/toc_ceq.htm.

49 CFR Part 171. Transportation. Chapter I. Research and Special Programs Administration, Department of Transportation. Part 171. General Information, Regulations, and Definitions. Accessible at: http://www.access.gpo.gov/nara/cfr/waisidx_99/49cfr171_99.html.

Abbott, S. 2006. Freshwater Mussel Survey on 27 Pre-Determined Stream Locations. Fort Benning, GA. May-June. USFWS Southeast Region, Atlanta, GA.

Aflac. 2007. Press Release: "Aflac Opens New Headquarters Facility, Completing First Phase of Georgia's Largest Expansion Project." Accessible at: http://www.aflac.com/us/en/aboutaflac/PressReleaseStory.aspx?rid=1017228. 19 June.

Alabama Association of Regional Councils. 2002. AARC Planning. Accessible at: http://www.alarc.org/planning/index.html

American Planning Association. 2006. Full Speed Ahead. Communities are gearing up for a new round of military base expansions. *Planning Magazine*. Accessible at: http://www.columbusga.com/mpo/BRAC/PLANNING%20MAGAZINE%20OCTOBER%20ARTICLE.pdf. October.

Brown, John W. 2008. BRAC (SAIC Program Manager), Fort Benning. Email communication with Kathy Rose, TEC Inc. 28 April.

California Air Resources Board (CARB). 2005. Comparison of Asphalt Paving Emission Factors.

Chattahoochee River Basin Watershed Protection Plan (CRBWPP). 2006. Environmental Protection Division. Georgia Department of Natural Resources. Chattahoochee River Basin Watershed Protection Plan. Accessed 25 October at: http://www.gaepd.org/Documents/chatt.html

Columbus Consolidated Government. 2006a. History of Columbus, GA Accessible at: http://www.columbusga.org/history/history.htm. Accessed 11 November.

_____. 2006b. Consolidation: A New Government for Columbus, GA. City/County Government Consolidation. January 1, 1971. Accessible at: http://www.columbusga.org/history/. Accessed 11 November.

_____. 2003. Chapter 8: Land Use. Updated. Accessible at: http://www.columbusga.com/mpo/Comp_Planning.html. Accessed 27 September.

Columbus Fire and Emergency Medical Services. 2007. Five Year Strategic Plan. Columbus, GA. January 2007 Revision.

Columbus Parks. 2007. Website information gathered in February from: http://www.columbusga.org/parks/park_sites/riverwalk.htm.

Columbus Police Department. 2007. Website information gathered in February from: http://www.columbusga.org/police/depts.html.

Council on Environmental Quality (CEQ). 2005. Memorandum to Heads of Federal Agencies regarding Guidance on the Consideration of Past Actions in Cumulative Effects Analysis. 24 June.

Cusseta-Chattahoochee Unified Government. 2007. Fire protection information found at: http://www.ugoccc.us/.

Deaver, S. 2000. An Ethnographic Overview of the Fort Benning Military Reservation. GA and AL. November.

Departments of the Army, Navy, and Air Force. 1987. Water Supply Sources and General Considerations. TM 5-813-1/AFM 88-10, Vol. 1. 4 June.

Department of Defense (DoD). 2006. Quadrennial Defense Review Report. Secretary of Defense. Washington, D.C. February.

_____. 2005a. Real Property Acquisition, Instruction Number 4165.71. Secretary of Defense. Washington, D.C. January.

_____. 2005b. Army Energy Strategy for Installations. Secretary of Defense. Washington, D.C. July.

_____. 1996. Pollution Prevention, Instruction Number 4715.4. Secretary of Defense. Washington, D.C. June.

Elliott, D.T., Hamilton, J.L, Thomason P., Emrick, M. and Stoops, R.W., Jr. 1995. Historic Preservation Plan for the Cultural Resources on U S. Army Installations at Fort Benning Military Reservation. Chattahoochee and Muscogee Counties, GA, and Russell County, AL. Submitted by Garrow & Associates, Inc. For the Southeast Archeological Center, National Park Service. Tallahassee, FL.

Eubanks, M.J. and Buckalew, J.O. 2005. Chattahoochee River Restoration: Removal of City Mills and Eagle and Phenix Dams. Proceedings of the 2005 Georgia Water Resources Conference. Held April 25-27, 2005, at The University of Georgia. Kathryn J. Hatcher. Editor, Institute of Ecology. The University of Georgia, Athens, GA. Accessible at: http://www.uga.edu/water/GWRC/Papers/EubanksM-GWRCpaper.pdf

Federal Highway Administration (FHWA). 2006. Information on SAFETEA-LU Section 1927 14th Amendment Highway Corridor and 3rd Infantry Division Highway Corridor a.k.a. "I-14" and "I-3". Accessible at: http://www.fhwa.dot.gov/Planning/sec1927corridors.htm. Updated 30 October.

Fire Departments Net. 2007. Rural fire department information for Muscogee County, GA and Russell, AL accessed at: http://www.firedepartments.net.

Fort Benning. 2009a. Final Addendum to the Final Biological Assessment for Proposed Maneuver Center of Excellence Actions at Fort Benning, GA. 23 March

_____. 2009b. Addendum 2 To the Biological Assessment for Proposed Maneuver Center of Excellence Actions at Fort Benning, Georgia 4 May

_____. 2009c. Final Environmental Assessment for the Outdoor Recreation Plan, Fort Benning, Georgia January

_____. 2008a. U.S. Army Infantry Homepage. Accessible at: https://www.benning.army.mil/infantry/toc/mission.htm. August.

_____. 2008b. Geographic Information System (GIS) Data layers received from Fort Benning Conservation and Range Divisions.

_____. 2008c. Maneuver Center of Excellence Homepage. Accessible at: https://www.benning.army.mil/mcoe/content/MCOEmission. August.

_____. 2008d. MCOE Transformation Update Briefing. 2007 Armor Conference. . Updated by Jeff Arneson. 27 June.

_____. 2007a. Final Environmental Impact Statement for BRAC 2005 and Transformation Actions at Fort Benning, GA. October.

_____. 2007b. Biological Assessment for BRAC 2005 and Transformation Actions at Fort Benning, GA. April.

_____. 2006a. Range and Training Land Program Development Plan. Fort Benning, GA. U.S. Army Engineering and Support Center. Huntsville, AL. June.

_____. 2006b. Monthly update. Fort Benning, Georgia Home of the Maneuver Center. PowerPoint Presentation. 28 March.

_____. 2006c. Command Data Summary. Last updated 8 May.

_____. 2006d. Maneuver Center of Excellence Implementation Timeline. Maneuver Center Realignment and Coordination Cell Infantry Futures Group. U.S. Army Infantry Center. Fort Benning, GA. Updated 25 April.

_____. 2006e. Maintenance and Facilities Requirements. PowerPoint Presentation. Information received in July from Fred Hart, Strategic Planner, BRAC, Director of Logistics. Strategic Business Branch. Fort Benning, GA.

_____. 2006f. Preliminary Jurisdictional Determination Report. Wetlands Delineations and Stream Evaluations. Fort Benning, GA.

_____. 2006g. Fort Benning Terrestrial Resources Inventory Report. 1995-1999. Conducted by: U.S. Fish and Wildlife Service, West GA Field Sub-Office.

_____. 2006h. Hazardous Waste Program. U.S. Army Infantry Homepage. Environmental Management Division. Accessible at : https://www.benning.army.mil/emd/_program_mgt/hazardous_waste/index.htm

_____. 2006i. Important Notes for Visiting Units. U.S. Army Infantry Homepage. Environmental Management Division. Accessible at : https://www.benning.army.mil/emd/_program_mgt/content/visiting_units.htm.

_____. 2006j. Existing Conditions Section for the Draft Fort Benning Comprehensive Traffic Study. Fort Benning, GA (includes drawings for proposed transportation improvement projects).

_____. 2005a. Requirements Analysis for Permanent Facilities. U.S. Army Armor Center. Fort Benning GA. November.

_____. 2005b. Environmental Assessment 362nd Engineer Multi-Role Bridge Company, establishment at Fort Benning, GA. U.S. Army Corps of Engineers, Fort Worth District, TX. October

_____. 2005c. Fort Benning Environmental Action Plan. Fort Benning, GA.

_____. 2005d. Fort Benning Installation Action Plan. Fort Benning, GA.

_____. 2005e. Environmental Assessment for Development and Implementation of a Historic Properties Component (HPC) Plan for Fort Benning in Accordance with Army Alternative Procedures. Prepared for Fort Benning, GA. October.

_____. 2005f. Residential Communities Initiative. Final Environmental Assessment. Fort Benning, GA. June.

_____. 2005g. Final Environmental Assessment for the Construction of the Infantry Platoon Battle Course. Fort Benning, GA and AL. August.

_____. 2005h. Environmental Assessment for Temporary Brigade Combat Team Support Facilities. Brigade Combat Team Training at Fort Benning, GA. Environmental Management Division. U.S. Army Garrison. Fort Benning, GA. U.S. Army Corps of Engineers. Fort Worth District, TX. January.

_____. 2005i. Environmental Assessment 362nd Engineer Multi-Role Bridge Company, establishment at Fort Benning, GA. U.S. Army Corps of Engineers, Fort Worth District, TX. October

_____. 2004a. Historic Properties Component of the Integrated Cultural Resource Management Plan. Third Draft. Department of the Army. U.S. Army Infantry Center. Fort Benning, GA. & AL, For Certification under the Army Alternate Procedures for Historic Properties. In lieu of 36 CFR Part 800 for Section 106. Compliance of the National Historic Preservation Act. Third Draft. July.

_____. 2004b. Final Environmental Impact Statement Digital Multi-Purpose Range Complex. April.

_____. 2004c. Integrated Contingency Plan. Fort Benning, GA.

_____. 2003a. Part 70 Operating Permit. No. 9711-215-0021-V-01-0. 16 June.

_____. 2003b. Integrated Natural Resources Management Plan. Fort Benning Army Installation. 2001-2005. Updated September.

_____. 2002. Asbestos Management Plan. Environmental Management Division. Fort Benning, GA.

_____. 2001. Integrated Natural Resource Management Plan. Environmental Management Division. Fort Benning, GA.

_____. 1998. Final Polychlorinated Biphenyl (PCB). Management Manual. Fort Benning, GA. Prepared by: U.S. Army Corps of Engineers, Savannah District by Law Engineering and Environmental Services, Inc. July.

_____ 1994. Real Property. Master Plan for the U.S. Army Infantry Center and Fort Benning Long Range Component. March.

_____ nd. Environmental Management Division, Cultural Resources Management. https://www.benning.army.mil/EMD/program/cultural_resources/index.htm. Accessed August 12, 2008.

Garten, C.T., and Ashwood, T.L. 2004. Modeling Soil Quality Thresholds to Ecosystem Recovery at Fort Benning, GA, ORNL/TM-2004/41, Environmental Sciences Division, Oak Ridge National Laboratory. Oak Ridge, TN.

Georgia Administrative Rules and Regulations, Chapter 391, *Georgia Department of Natural Resources*, Section 3, *Environmental Protection*, Subsection 1, *Air Quality Control*.

Georgia Department of Community Affairs. Undated. List of Local Government County Planning Level Designations.

Georgia Department of Natural Resources (GDNR). 2006. Special Concern Animals List. Accessible at: http://georgiawildlife.dnr.state.ga.us/content/specialconcernanimals.asp. Accessed 30 October.

_____. 2005. A Comprehensive Wildlife Conservation Strategy for GA. Georgia Department of Natural Resources, Wildlife Resources Division. Accessible at: www.gadnr.org.

Georgia Department of Transportation. 2006. Public information open house handout package for proposed Widening of St. Mary's Road from Robin Road to Northstar Drive. Project STP-215-1-(2). Accessible at: http://tomcat2.dot.state.ga.us/PublicOutreach_ex/projectInfo/projectInfo.cfm?projID=332780-&projNum=STP-215-1(2)&projName=St.%20Mary#. 17 August.

_____. 2003. Georgia Aviation System Plan Airport Summary Report. Accessible at: http://tomcat2.dot.state.ga.us/Aviation/PDF/System_Plans/CSG_SysPlan.pdf. Summer.

Georgia Environmental Protection Division (GEPD). 2006a. GA 2004 305(b)/303(d). List Documents final. Accessible at: http://www.gadnr.org/epd/Documents/305b.html.

_____. 2006b. Georgia Environmental Protection Division. Watershed Protection Branch. 25 October MS4 permitting information provided. Atlanta, GA.

_____. 2006c. Georgia Environmental Protection Division. Existing Rules and Corresponding Laws. Accessed 1 November. Accessible at: http://www.gaepd.org/Documents/rules exist.html

_____. 2003a. Total Maximum Daily Load Evaluation for Thirty-One Stream Segments in the Chattahoochee River Basin For Sediment (Biota Impacted). Submitted to U.S. Environmental Protection Agency Region 4. Atlanta, GA. Submitted by: Georgia Department of Natural Resources, Environmental Protection Division. Atlanta, GA. January. Accessible at: http://www.gadnr.org/epd/Files_PDF/techguide/wpb/TMDL/Chattahoochee/chatt_bio_tmdl.pdf

_____. 2003b. Total Maximum Daily Load Evaluation for Seventy-Nine Stream Segments in the Chattahoochee River Basin For Fecal coliform. Submitted to U.S. Environmental Protection Agency, Region 4. Atlanta, GA. Submitted by: Georgia Department of Natural Resources Environmental Protection Division. Atlanta, GA. February . Accessible at: http://www.gadnr.org/epd/Files_PDF/techguide/wpb/TMDL/Chattahoochee/chatt_fc_tmdl.pdf

Georgia Tech. 2005. GIS layer for Kindergarten through 12th grade schools in the State of GA.

Government Accounting Office (GAO). 2003. Testimony Before the Committee on Environment and Public Works. U.S. Senate. Military Training. Department of Defense Approach to Managing Encroachment on Training Ranges Still Evolving. Statement of Barry W. Holman. Director Defense Infrastructure Issues. Accessible at: http://www.gao.gov/new.items/d03621t.pdf. 2 April.

Greater Columbus Georgia Chamber of Commerce. 2008. Lawson Army Airfield, Fort Benning, GA Regional Airfield Military Partnership (RAMP) Request for Proposal. Accessible at: http://www.columbusgachamber.com/regionalair/RAMPRFP63008.pdf.

Hall, L.S., P.R. Krausman, and M.L. Morrison. 1997. The habitat concept and a plea for standard terminology. Wildlife Society Bulletin. 25:171-182.

Harris County. 2007. Police and Fire Departments Information derived from these websites: http://www.harriscountysheriff.org and

http://www.harris-county.com/communities/firedepartments.php.

Joint Harris County, City of Pine Mountain, City of Shiloh, City of Waverly Hall Comprehensive Planning Commission. 1992. A Joint County/City Comprehensive Plan for Harris County and the cities of Pine Mountain, Shiloh and Waverly Hall. July. Accessed at: http://www.georgiaplanning.com/planspub1/index.asp?plnid=110

Jones, R., AICP. 2006. Record of Conversation between Rick Jones, Planning Director, City of Columbus and Carol Wirth, TEC Inc. regarding land use planning for the Columbus-Muscogee County Area. 28 September.

Kane & Keeton. Kane, S. and Keeton, R. 1998. The Land and the People. Southeast Archaeological Center. Tallahassee, FL. Fort Benning, GA. National Park Service.

Lee-Russell Council of Governments (LRCOG). 2006. About LRCOG. Accessible at: http://www.lrcog.com/aboutlrcog.html. Accessed 14 November.

Lower Chattahoochee Regional Development Center. 2008. Comprehensive Plan for the Unified Government of Cusseta-Chattahoochee County. Draft Community Assessment. 2008-2030. July.

_____. 2006. Comprehensive Plan for the Unified Government of Cusseta-Chattahoochee County. Draft Community Assessment. 2007-2030. July.

Markham, Johnny. 2009. ITAM Coordinator. Personal Communication with Steve Berry and Kathy Rose of TEC Inc. January.

McDonald, J. 2006. Ft. Benning Terrestrial Resource Inventory Report for Species of Management Concerns. USDA Chattahoochee-Oconee National Forest. Gainesville, FL.

Meyers, M. 2008a. The Challenges of Linking Carbon Emissions, Atmospheric Greenhouse Gas Concentrations, Global Warming and Consequential Impacts. May 14.

_____. 2008b. Memo to Dale Hall and James Lecky: Endangered Species Act and Greenhouse Gas Emitting Activities. October 3.

Midwest Research Institute (MRI). October 2005. MRI Project No. 110397. Analysis of the Fine Fraction of Particulate Matter in Fugitive Dust, conducted for the Western Governors Association Western Regional Air Partnership (WRAP).

National Center for Rural Law Enforcement (NCRLE). 2007. Small Town Police Enforcement Georgia. Accessible at: Http://64.219.0.24/Rural/GAPD.asp and http://64.219.0.24/Rural/GASO.asp.

National Institute for Occupational Safety and Health (NIOSH). 2006. Criteria for a Recommended Standard: Occupational Noise Exposure. Accessible at: Http://www.cdc.gov/niosh/docs/98-126/chap1.html.

National Park Service (NPS). 2002. How to Apply the National Register Criteria for Evaluation. National Register Publications Bulletin 15. U.S. Department of the Interior.

_____. 1998. Guidelines for Evaluating and Documentation Traditional Cultural Properties. National Register Publications Bulletin 38. U.S. Department of the Interior.

_____. 1992. Guidelines for Evaluating and Registering Cemeteries and Burial Places. National Register Bulletin 41.

NatureServe. 2008. NatureServe Explorer. Visited 29 October. Accessible at http://www.natureserve.org/explorer/servlet/NatureServe. Last updated June 2008.

National Oceanographic and Atmospheric Administration (NOAA). 2009. NOAA Satellite and Information Service. Data from the following website: http://lwf.ncdc.noaa.gov/oa/climate/globalwarming.html. June.

Occupational Safety and Health Administration (OSHA). 2006. Safety and Health Topics: Hazardous and Toxic Substances. U.S. Department of Labor, Occupational Safety & Health Administration. Accessible at: http://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html.

Patrick, T.S., Allison, J.R., and Krakow, G.A. 1995. Protected Plants of GA. An Information Manual on Plants Designated by the State of GA as Endangered, Threatened, Rare or Unusual. Georgia Department of Natural Resources. Accessed at: http://georgiawildlife.dnr.state.ga.us/content/displaycontent.asp?txtDocument=89&txtPage=7.

Phenix City. 2007. Police and Fire Departments information accessed at: http://www.phenixcityal.us.

Phillips, J.A. 2006. Statement of Dr. John A. Phillips. Superintendent, Muscogee County School District. Columbus, GA. On behalf of the Seven Rivers National Coalition, request for Federal Funding for School Districts Surrounding Military Installations Gaining Large Numbers of Personnel before the House Appropriations Committee. Subcommittee on Labor, Health and Human Services, Education and Related Agencies. Accessible at: http://appropriations.house.gov/_files/JohnPhillipsTestimony.pdf. 30 March.

Pyne, M. 2001. Ecological groups. Fort Benning, GA--a re-analysis. Report submitted to Fort Benning under DAMD17-00-2-0017 05 17. October, 17 pp.

Russell County Sheriff's Office. 2007. Information obtained from Sheriff's website: Http://www.rcso.org/patrol.html.

Sassaman, K.E. 1983. Middle and Late Archaic Settlement in the South Carolina Piedmont. Unpublished M.A. thesis. Department of Anthropology. University of South Carolina, Columbia.

Stats Indiana. 2007. Population Data by State and County. Accessed June 12, 2008. <http://www.stats.indiana.edu/uspr/a/us_profile_frame.html>.

Streich, J.P., and Kemp, A.C. 1994a. Sweet Pitcherplant Restoration and Management Plan. Mike-6, Long Branch Site (revised). Unpublished report prepared by The Nature Conservancy, Atlanta.

_____. 1994b. Sweet Pitcherplant Restoration and Management Plan: Oscar-14, Randall Branch Site (revised). Unpublished report prepared by The Nature Conservancy, Atlanta.

Sweeney, M. 2008. BRAC/MCOE (Range Control SAIC Project Manager), Fort Benning. Email communication with Kathy Rose, TEC Inc. March.

The Bugwood Group. 2006. Insects: The Top 50 in GA. Accessible at: http://www.gaipm.org/top50/. Accessed 30 October.

The Nature Conservancy (TNC). 2006. Fort Benning Army Compatible Use Buffer (ACUB). Review. Wade Harrison. 4 October.

The Valley Partnership. 2008. Fort Benning Joint Land Use Study. May.

Transportation Research Board National Research Council. 2000. Highway Capacity Manual (HCM) 2000.

Trulia Real Estate Search Engine (Trulia). 2007. Median 2007 home prices for Chattahoochee County, Georgia from: http://www.trulia.com/home_prices/Georgia/Chattahoochee_County-heat_map/.

_____. 2007. 2007 Median home prices for Muscogee County, Georgia from: http://www.trulia.com/home_prices/Georgia/Muscogee_County-heat_map/.

_____. 2007. Median 2007 home prices for Harris County, Georgia from: http://www.trulia.com/home_prices/Georgia/Harris_County-heat_map/.

_____. 2007. Median 2007 home prices for Marion County, Georgia from: http://www.trulia.com/home_prices/Georgia/Marion_County-heat_map/.

_____. 2007. Median 2007 home prices for Russell County, Alabama from: http://local.reply.com/real-estate/AL/russell-county.html.

Upper Chattahoochee Riverkeeper. 2006. Tristate Water Allocations. Three States, Two Basins, One Water War. Accessible at: http://www.chattahoochee.org/policy5.htm

U.S. Army. 2008. BRAC Community Update on Grow the Army (GTA) Stationing Announcement. PowerPoint presentation given by Fort Benning. 8 January.

_____. 2007. Management guidelines for the Red-cockaded Woodpecker on Army installations. Department of Defense, US Department of the Army.

_____. 2006a. Posture Statement. Accessible at: http://www.army.mil/aps/06/16_download.html.

_____. 2006b. Base Realignment and Closure Manual for Compliance with the National Environmental Policy Act. January.

_____. 2006c. Armor School and Center at Fort Knox. Visited 24 April. Accessible at: http://www.knox.army.mil/school/.

_____. 2006d. Army Compatible Use Buffer Program. Accessible at: http://www.sustainability.army.mil/tools/programtools_acub.cfm#20/. Updated 1 May.

_____. 2006e. U.S. Army Infantry Center. Fort Benning, GA & AL. Historic Properties Component of the Integrated Cultural Resources Management Plan (ICRMP). For Certification under the Army Alternative Procedures for Historic Properties. February.

_____. 2005a. Army Regulation 210–20. Installations Real Property. Master Planning for Army Installations. Headquarters Department of the Army. Washington, DC. Accessible at: https://134.11.61.26/ArchivePub/Publications/DA/AR/ByPub.htm. May.

_____. 2005b. U.S. Army Infantry Center Regulation 210-4. Headquarters U.S. Army Infantry Center and Fort Benning. Installations Range and Terrain Regulation. 11 May.

_____. 2005c. Army Regulation 350-19. The Army Sustainable Range Program. Headquarters Department of the Army. Washington, DC. Accessible at: http://www.army.mil/usapa/epubs/pdf/r350_19.pdf. 30 August.

_____. 2004a. Training Circular No. 25-8. Training Ranges. Headquarters Department of the Army. Washington, D.C. April.

_____. 2004b. The Army Strategy for the Environment. Sustain the Mission. Secure the Future. Accessible at: https://www.asaie.army.mil/Public/ESOH/doc/ArmyEnvStrategy.pdf.

_____. 2003. Army Regulation 385-63. Range Safety. Headquarters Departments of the Army and the U.S. Marine Corps. Washington, D.C. May.

_____. 2001. Army Regulation 5-10. Management Stationing. Headquarters Department of the Army Washington, DC. Accessible at: https://134.11.61.26/ArchivePub/Publications/DA/AR/ByPub.htm. March 1.

_____. 2000. U.S. Army Explosive Safety Program. February.

_____. 1999. Environmental Surveys, Assessments, and Documentation for Land Exchange between the U.S. Army (Fort Benning, Georgia) and Consolidated Government of Columbus/Muscogee County, Georgia. Final Environmental Impact Statement. Volume I. 25 January.

_____. 1996. Management Guidelines for the Red-cockaded Woodpecker on Army installations. Department of Defense, U.S. Department of the Army.

_____. 1994. Accident reporting and Records. November.

_____. 1987. Prevention of Motor Vehicle Accidents. March.

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). 2009. Fort Benning Noise Contours for the MCOE EIS Documentation. May.

_____. 2006a. Fort Benning Noise Contours for the NEPA BRAC Documentation. March.

_____. 2006b. U.S. Army Center for Health Promotion and Preventive Medicine. Fact Sheet: How does the Department of Defense assess noise and its impacts? Operational Noise Program. Aberdeen Proving Ground, MD. Accessible at: Http://chppm-www.apgea.army.mil/dehe/morenoise.

_____. 2006c. Noise metrics factsheets. Operational Noise Program. Aberdeen Proving Ground, MD. Accessible at: Http://chppm-www.apgea.army.mil/dehe/morenoise.

U.S. Army Corps of Engineers (USACE). 2008. Range Design Guides. Information gathered from the USACE website at: http://www.hnd.usace.army.mil/rdg/InterTemplate.aspx.

_____. 2008b. Final Biological Assessment for the Maneuver Center of Excellence at Fort Benning, Georgia. October

_____. 2007a. Final Environmental Impact Statement for BRAC 2005 and Transformation Actions at Fort Benning, GA. October.

_____. 2007b. Record of Decision BRAC 2005 and Transformation Actions at Fort Benning, GA. November.

_____. 2007c. Biological Assessment for BRAC 2005 and Transformation Actions at Fort Benning, GA. April.

_____, 2006. Fort Benning, GA, Modified Record Fire Range Intermediate Grading Erosion Control Plan, Sheet , General Notes. U.S. Army Corps of Engineers, Savannah District.

_____. 2003a. Range and Training Land Program Development Plan. Fort Benning, GA. Final Submittal. Contract No. DACA87-00-D-0017. Delivery Order 0056. U.S. Army Engineering and Support Center. Huntsville AL.

_____. 2003b. Health and Safety Requirements. November.

_____. 2002a. Record of Decision, Army Transformation Programmatic Environmental Impact Statement. April.

_____. 2002b. Final Programmatic Environmental Impact Statement for Army Transformation. Mobile District. February.

U.S. Army Environmental Center (USAEC). 2007. Final Programmatic Environmental Impact Statement for Army Growth and Force Structure Realignment. Aberdeen Proving Ground, MD. October.

_____. 2008. Record of Decision Programmatic Environmental Impact Statement for Army Growth and Force Structure Realignment. Aberdeen Proving Ground, MD. Notice of Availability announced January.

U.S. Army Environmental Command. 2006. Army Compatible Use Buffer Program End of Year Summary. FY06. Accessible at: http://aec.army.mil/usaec/acub/docs_acub/eoys-fy06.pdf.

U.S. Army Tank-automotive and Armament Command (TACOM). 2008. M1200 Armored Knight Draft Supplemental Environmental Assessment.

U.S. Bureau of Economic Analysis (USBEA). 2006. Muscogee, Chattahoochee, Harris and Marion Counties, GA and Russell County, AL. Employment Data. Select major area, minor area. Accessible at: http://www.bea.gov/bea/regional/reis/. CA25N NAICS.

U.S. Bureau of Labor Statistics (USBLS).

_____ 2007a. 2007 Data Labor Force Data by County, 2007 Annual Averages. Accessed June 2008 at: http://www.bls.gov/lau/ and ftp://ftp.bls.gov/pub/special.requests/la/laucnty07.txt.

_____ 2007b. Unemployment Rates for States Annual Average Rankings Year: 2007. Accessed June 2008 at: http://www.bls.gov/lau/ and http://www.bls.gov/lau/lastrk07.htm.

U.S. Census Bureau. 2007. Press Release CB07-42. "Arizona's Maricopa Leads Counties in Population Growth Since Census 2000." Accessed March 2008 at: http://www.census.gov/Press-Release/www/releases/archives/population/009756.html.

_____. 2000a. Housing Data. H3, H6, H8, H76, H85. Accessible at: http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_SF3_U&_lang=en&_ts=164731777414.

_____. 2000b. De-cennial census of the Population. Accessed September 2007 at: http://www.census.gov/main/www/cen2000.html.

U.S. Department of Agriculture (USDA). Natural Resources Conversation Service. 2006a. Web Soil Survey. Accessible at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

_____. 2006b. Net Change in Acreage of Prime Farmland Used as Rangeland. 1982 – 1997. Accessible at http://www.nrcs.usda.gov/technical/land/meta/m6003.html.

_____. 2003. User's Guide: Revised Universal Soil Loss Equation Version 2 -RUSLE2.

_____. 1999. Soil Taxonomy. A Basic System of Soil Classification for Making and Interpreting Soil Surveys. Agriculture Handbook: Number 436.

U.S. Environmental Protection Agency (USEPA). 2009. Ozone and $PM_{2.5}$ state attainment recommendations accessed at: http://www.epa.gov/pmdesignations/2006standards/state.htm and http://www.epa.gov/ozonedesignations/2008standards.htm.

_____. 2006. Criteria Pollutant Green Book. Accessible at: http://www.epa.gov/oar/oaqps/greenbk/.

_____. 2005. National Emission Inventory (NEI) database. August.

_____. 2004a. EPA Report No. NR-005c, Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling.

_____. 2004b. EPA Report No. NR-009c, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition.

_____. 2004c. EPA Report No. NR-010d, Exhaust Emission Factors for Nonroad Engine Modeling

Spark-Ignition.

_____. 2004d. EPA 420-P-04-001, NR-002b, Conversion Factors for Hydrocarbon Emission Components.

_____. 2003. Mobile 6.2.03, Mobile Source Emission Factor Model.

_____. 2002. Lists/Assessment Unit information Year 2002. Environmental Protection Agency: 305(b). Accessed 27 October. Accessible at: http://iaspub.epa.gov/tmdl/enviro.control?p_list_id=GA-R03130001.

_____. 1995. Compilation of Air Pollution Emission Factors, AP-42, Volume I.

_____. 1991. EPA 460/3-91-02, Nonroad Engine and Vehicle Emission Study—Report.

_____. 1971. U.S. Environmental Protection Agency Noise from Construction Equipment and Operations, Building Equipment and Home Appliances.

NTID 300-1.

U.S. Fish and Wildlife Service. 2009. Final Biological Opinion on the U.S. Army Maneuver Center of Excellence at Fort Benning, Georgia. May

_____. 2006a. U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants. Review of Native Species that are Candidates or Proposed for Listing and Endangered or

Threatened. Annual Notice of Findings on Resubmitted Petitions. Annual Description of Progress on Listing Actions. Federal Register 71: 53756-53836.

_____. 2006b. Freshwater mussel survey report on 27 pre-determined stream locations, Fort Benning, Georgia, May-June 2006. Sandy Abbott, Georgia Ecological Services.

_____. 1999. South Florida Multi-Species Recovery Plan. South Florida Field Office. 18 May, pp 3-3 thru 3-30.

_____. 1993. Recovery plan for Michaux's Sumac (*Rhus michauxii*). USFWS, Atlanta, GA. 30 pp.

_____. 1990. Relict Trillium Recovery Plan. Atlanta, GA, 20 pp.

U.S. Geological Service (USGS). 2006. USGS. Chattahoochee River Basin. Accessed 25 October. Accessible at: http://ga.water.usgs.gov/nawqa/basin7.html.

Watts, W.A. 1971. Postglacial and Interglacial Vegetation History of Southern GA and Central FL. *Ecology*, Vol. 52:676-90.

Western Regional Air Partnership (WRAP). November 2004. WRAP Fugitive Dust Handbook.

CHAPTER 8

PERSONS CONSULTED

8.0 PERSONS CONSULTED

Aut, Lt. Col. David. 2009. Acting Hospital Chief of Staff. Fort Benning, GA.

Barron, M. 2008. Wildlife Biologist, RCW Specialist. Fort Benning, GA.

Brent, J. 2008. Chief, Environmental Division. Fort Benning, GA

Brown, J.E. 2008. MCOE NEPA Coordinator. Fort Benning, GA.

Brown III, J.W. 2008. BRAC SAIC Program Manager. Fort Benning, GA.

Brown, R.A. 2009. RCI Housing. Fort Benning, GA.

Chauvey, P. 2008. Chief Compliance, Environmental Division. Fort Benning, GA.

Clarke, M. 2006. PCB/Lead/Asbestos Program Manager, Environmental Management Division. Fort Benning, GA.

Cooper, D. 2008. Planning and Development for Columbus and Muscogee. Columbus, GA.

Davis, S. 2008. CWW, Deputy Director of Operations and Technical Services.

DeCarlo, D. 2007. Real Estate Division. Fort Benning, GA.

Fincher, M. 2007. Utilities Manager, Directorate of Public Works. Fort Benning, GA.

Gaines, G. 2006. CAA Program Manager. Fort Knox, KY.

Gray, B. 2008. Community Development Department for Harris County. Hamilton, GA.

Griffin, J. 2006. GIS Coordinator, Columbus Consolidated Government.

Hack, A. 2008. GIS Specialist

Hamilton, C.E. 2008. Cultural Resources Manager. Fort Benning, GA.

Harrison, W. 2008. The Nature Conservancy in Georgia. Atlanta, GA.

Henson, A. 2008. Department of Community Affairs. Atlanta GA.

Hobson, R. 2007, 2008. Office of Planning and Quality Growth, Georgia Department of Community Affairs.

Hollon, G. 2008. Soil Conservation. Fort Benning, GA.

Holloway, K. 2008. Facility Master Planner. Fort Benning, GA.

Johnson, S. 2008. Comprehensive Plan Board. Talbotton, GA.

Jones, R. 2008. BRAC NEPA Coordinator. Fort Benning, GA.

Leeder, E. 2008. Air and Noise Program Manager. Fort Benning, GA.

Malphrus, M. 2007. District Manager for Waste Management, Alabama.

McPherson, B. 2009. Air Program Manager. Fort Benning, GA.

Mixon, G. 2008. Planning Director, Middle Flint Regional Development Council.

Morris, R. 2006. Planning Director, Lower Chattahoochee Regional Development Council.

Osbourne, J.R. 2009. Business Operations Division, MWR. Fort Benning, GA.

Perkins, D. 2006. BRAC Environmental Program Manager, Installation Management Command - Southeast Region (IMCOM-SE). Fort McPherson, GA.

Poppert, J. 2006. Recycling Clerk. Fort Knox, KY.

Scott, B. 2006. Lee-Russell Council of Governments.

Seda, F. 2008. SPCC/SWP3/NPDES (Construction/Industrial/MS4)/ISCP/EPCRA Program Manager, Environmental Division. Fort Benning, GA.

Smith, Greg. 2008. Building Inspection for Russell County. Russell, GA.

Stoinoff, C. 2008. DAS-Strategic Planning Team. Fort Knox, KY.

Storey, Bonnie. 2008. Air Quality Compliance Program Specialist. Fort Benning, GA.

Sweeney, M. 2008. Program Manager, Maneuver Center Realignment Coordination Cell. Fort Benning, GA.

Swiderek, P. 2008. Chief, Conservation Branch, Environmental Division,. Fort Benning, GA.

Thornton, R. 2008. Threatened & Endangered Species Biologist, Conservation Branch. Fort Benning, GA.

Veenstra, L. 2008. Environmental Attorney. Fort Benning, GA.

Weekley, F. 2008. Range Manager. Fort Benning, GA.

Wilkins, J. 2007. CWA/Waste Water Programs Manager. Fort Benning, GA.

Woodruff, A. 2006. Manager, Planning and Outreach, Office of Planning and Quality Growth, Georgia Department of Community Affairs.

CHAPTER 9

ACRONYMS AND ABBREVIATIONS

9.0 ACRONYMS AND ABBREVIATIONS

AAF	Army Airfield
AAFES	Army and Air Force Exchange Service
AAP	Army Alternative Procedures
ACHP	Advisory Council on Historical Preservation
ACM	Asbestos Containing Materials
ACP	Access Control Point
ACUB	Army Compatible Use Buffer
ADEM	Alabama Department of Environmental Management
ADNL	A-Weighted Day-Night Level
AEM	Adaptive Environmental Management
AGL	Above Ground Level
AIRFA	American Indian Religious Freedom Act
AL	Alabama
AMF	Army Modular Force
ANCOC	Armor Crewman/Scout Advanced NCO Course
APE	Area of Potential Effect
AR	Army Regulation
ARC	Army Reconnaissance Course
ARPA	Archaeological Resources Protection Act
ARTEP	Army Training and Evaluation Program
ASIP	Army Stationing and Installation Plan
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AT/FP	Anti-Terrorism/Force Protection
BA	Biological Assessment
BCT	Brigade Combat Team
BFV	Bradley Fighting Vehicle
BGD	Buildings and Grounds Division
BMP	Best Management Practice
BO	Biological Opinion
BOLC	Basic Officer Leader Course
BRAC	Base Realignment and Closure
Btu	British Thermal Unit
C	Celsius
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CACTF	Combined Arms Collective Training Facility
CAP	Centralized Accumulation Point
CAV	Cavalry
CDI	Capabilities Development and Integration
CDNL	C-Weighted Day-Night Level
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFH	Cubic Feet per Hour
CFR	Code of Federal Regulation
cfs	Cubic Feet per Second
CHMCC	Centralized Hazardous Materials Control Center
CIDC	Criminal Investigation Command
CLFX	Convoy Live Fire Exercise
CO	Carbon Monoxide
COF	Company Operations Facility
CRBWPP	Chattahoochee River Basin Watershed Protection Plan
CRM	Cultural Resource Manager(ment)
CSE	Combat Support Equipment
CWA	Clean Water Act
CWW	City of Columbus Water Works
DAC	Department of Army Civilians
dB	Decibel
dBA	A-Weighted Decibel
dBC	C-Weighted Decibel
DDESB	Department of Defense Explosive Safety Board
DMPRC	Digital Multi-Purpose Range Complex
DNL	Day-Night Sound Level
DNR	Department of Natural Resources
DoD	Department of Defense
DOL	Directorate of Logistics
DOT	Department of Transportation
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization Market Service
DS/GS	Direct Support/General Support
DTDCD	Directorate of Training, Doctrine and Combat Development
EA	Environmental Assessment
EAP	Environmental Action Plan
ECS	Equipment Concentration Site

EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
ENG	Engineer Group
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right to Know Act
ER,A	Environmental Restoration, Army
ESA	Endangered Species Act
ESCA	Erosion and Sedimentation Control Act
ESMP	Endangered Species Management Plan
ESPCP	Erosion, Sedimentation, and Pollution Control Plan
FAA	Federal Aviation Administration
FCS	Future Combat Systems
FHWA	Federal Highways Administration
FIRM	Flood Insurance Rate Map
FL	Florida
FNSI	Finding of No Significant Impact
FORSCOM	Forces Command
FPPA	Farmland Protection Policy Act
ft	foot/feet
FTX	Field Training Exercise
FWPCA	Federal Water Pollution Control Act
FY	Fiscal Year
GA	Georgia
DNR	Georgia Department of Natural Resources
GAO	Government Accounting Office
GDOT	Georgia Department of Transportation
GDPR	Global Defense Posture and Realignment
GEPD	Georgia Environmental Protection Division
GHG	Green House Gases
GIS	Geographic Information System
GMD	Ground Mobility Division
GPCA	Georgia Plant Conservation Alliance
gpd	Gallons per day
HAP	Hazardous Air Pollutant
HCM	Highway Capacity Manual
HEMTT	Heavy Equipment Mobile Transport Truck
HETT	Heavy Equipment Transport Truck
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HPC	Historic Properties Component
HQ	Headquarters
HSMS	Hazardous Substance Management System
HUC	Hydrologic Unit Code
IAP	Installation Action Plan
ICP	Integrated Contingency Plan
ICRMP	Integrated Cultural Resource Management Plan
ICUZ	Installation Compatible Use Zone
ID	Infantry Division
IDG	Installation Design Guide
IET	Initial Entry Training
IMCOM-SE	Installation Management Command-Southeast Region
INRMP	Integrated Natural Resources Management Plan
IONMP	Installation Operational Noise Management Plan
IPBC	Infantry Platoon Battle Course
IRP	Installation Restoration Program
ISBC	Infantry Squad Battle Course
ISCP	Installation Spill Contingency Plan
ITAM	Integrated Training Area Management
JLUS	Joint Land Use Study
km	Kilometers
KY	Kentucky
LBP	Lead Based Paint
LCTA	Land Condition Trend Analysis
LEED	Leadership in Energy and Environmental Design
lf	Linear Feet
LID	Low Impact Development
LOS	Level of Service
LRCOG	Lee-Russell Council of Governments
LUPZ	Land Use Planning Zone
M	Mechanized
MACH	Martin Army Community Hospital
MBTA	Migratory Bird Treaty Act
mcf	Thousand Cubic Feet
MCM	Minimal Control Measures
MCOE	Maneuver Center of Excellence
MEDAC	Medical Department Activity
METRA	Metropolitan Transit Columbus Transportation System

mgd	Million Gallons per Day
MIM	Maneuver Impact Miles
MM	Million
MOGAS	Motor Gasoline
MOU	Memorandum of Understanding
MOUT	Military Operations Urban Terrain
MP	Military Police
MPTR	Multi Purpose Training Range
MRBC	Multi-Role Bridge Company
MRF	Materials Recovery Facility
MRI	Midwest Research Institute
MSA	Metropolitan Statistical Area
MS4	Municipal Separate Storm Water Sewer System
MSL	Mean Sea Level
MTMC	Military Traffic Management Command
$\mu g/m^3$	Micrograms Per Cubic Meter
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCO	Non-commissioned Officer
NCP	National Oil and Hazardous
NCRLE	National Center for Rural Law Enforcement
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
NO_2	Nitrogen Dioxide
NOAA	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
NOR	Notice of Registration
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Unit
NWI	National Wetland Inventory
O_3	Ozone
O.C.G.A.	Official Code of Georgia Annotated
OCS	Officer Candidate School
OMA	Operations and Maintenance, Army
OSHA	Occupational Safety and Health Administration
OSUT	One Station Unit Training
PAO	Public Affairs Office
Pb	Lead
PCB	Polychlorinated biphenyl
pCi/L	Picocuries per Liter
PCPI	Per Capita Personal Income
PEIS	Programmatic EIS
PIP	Public Involvement Plan
PK	Unweighted Peak
PL	Public Law
PM_{10}	Particulate Matter less than 10 Microns
$PM_{2.5}$	Particulate Matter less than 2.5 Microns
PN	Project Number
POI	Program of Instruction
POL	Petroleum, Oil, and Lubricant
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
PTE	Potential-To-Emit
PUAL	Pending Unit Action List
QDR	Quadrennial Defense Review
RCI	Residential Communities Initiative
RCRA	Resource Conservation and Recovery Act
RCW	Red-Cockaded Woodpecker
RDP	Range Development Plan
REC	Record of Environmental Consideration
RGR	Range Regiment
RMS	Range Maintenance Section
ROD	Record of Decision
ROI	Region of Influence
RPA	Reasonable and Prudent Alternative
RPMs	Reasonable and Prudent Measures
RPMP	Real Property Master Plan
RRC	Regional Readiness Command
RS	Recovery Standard
RSO	Range Safety Officer
RTLP	Range and Training Land Program
RTV	Rational Threshold Value

RUSLE	Revised Universal Soil Loss Equation
SARNAM	Small Arms Range Noise Assessment Model
SAP	Satellite Accumulation Point
SBV	Stream Buffer Variance
SC	South Carolina
SDWA	Safe Drinking Water Act
SDZ	Surface Danger Zone
SEMP	Strategic Ecosystem Management Plan
SERDP	Strategic Environmental Research & Development Program
SERO	Southeastern Regional Environmental Office
SHPO	State Historic Preservation Office(r)
SIP	State Implementation Plan
SLC	Scout Leaders Course
SMS	Standard for Managed Stability
SO_2	Sulfur Dioxide
SOCOM	Special Operations Command
SOF	Special Operations Forces
SOP	Standard Operating Procedures
SPCC	Spill Prevention Control and Countermeasures
STX	Situational Training Exercise
SWMP	Storm Water Management Plan or Solid Waste Management Plan
SWMU	Solid Waste Management Unit
SWP3	Stormwater Pollution Prevention Plan
TA	Training Area
TBD	To be determined
TC	Training Circular
TCE	Trichloroethylene
TDM	Travel Demand Management
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
tpy	Tons per Year
TRADOC	Training and Doctrine Command
TSCA	Toxic Substances Control Act
TSM	Abrams Series of Tanks
UA	Unit of Action
UAC	Urban Assault Course
USBLS	U.S. Bureau of Labor Statistics
UEA	Unique Ecological Area
UPH	Unaccompanied Personnel Housing
U.S.	United States
USAAA	U.S. Army Audit Agency
USAARMS	U.S. Army Armor School
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Center
USAIC	U.S. Army Infantry Center
USARC	U.S. Army Reserve Center(s)
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
UST	Underground Storage Tank
UXO	Unexploded ordnance
VEC	Valued Environmental Components
VOC	Volatile Organic Compound
WHINSEC	Western Hemisphere Institute for Security Cooperation
WMU	Watershed Management Unit
WWTP	Waste Water Treatment Plant