FINAL
BIOLOGICAL ASSESSMENT
FOR PROPOSED
MANEUVER CENTER OF EXCELLENCE ACTIONS
AT
FORT BENNING, GEORGIA

BIOLOGICAL ASSESSMENT

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1. INTRODUCTION

The Fort Benning Military Installation (Installation or Fort Benning), located in Chattahoochee and Muscogee Counties, Georgia (GA) and Russell County, Alabama (AL) (Figure 1-1), is currently undergoing major changes in its organizational structure. The actions proposed in this document include projects that have changed since their evaluation in a previous United States (US) Fish and Wildlife Service (USFWS) Biological Opinion (BO) for Base Realignment and Closure (BRAC) 2005 and Transformation Actions at Fort Benning, GA (Transformation) (USFWS 2007a) and additional actions that are necessary to support increased training demands of the Maneuver Center of Excellence (MCOE). Though not specifically required in the BRAC decision, the MCOE is scheduled to be established in October 2009 from the consolidation of the US Army Armor Center and School (USAARMC/S) and the US Army Infantry Center and School (USAIC/S) at Fort Benning. Additional actions needed to support the MCOE include new Transformation projects not previously evaluated and actions necessary for Grow the Army (GTA or Army Growth) and Global War on Terrorism (GWOT) initiatives.

In November 2007, the Army announced its decision to implement the BRAC 2005 and Transformation Actions at Fort Benning, GA in a Record of Decision (ROD) (US Army Corps of Engineers (USACE) 2007a). These actions included projects and training area uses that were funded, programmed and/or planned through Fiscal Year (FY) 2013, and that supported BRAC, Army Transformation, Army Modular Force (AMF), Global Defense Posture Realignment (GDPR) and Army Regulation (AR) 5-10 stationing initiatives. **Collectively, these actions are referred to in this document as Fort Benning "Transformation."** Environmental impacts from Fort Benning Transformation were evaluated in a Biological Assessment (USACE 2007b), BO (USFWS 2007a) and a Final Environmental Impact Statement (FEIS) (USACE 2007c). The most substantial of the Transformation impacts resulted from the movement of the USAARMC/S from Fort Knox, Kentucky (KY) to Fort Benning. Some of the projects and training impacts originally identified in the Transformation Biological Assessment (USACE 2007b) and BO (USFWS 2007a) have changed in location, size, and/or timing substantially enough to require reinitiation of formal consultation with the USFWS.

Transformation projects that were identified as reasonably foreseeable into FY14, but were neither funded nor programmed when the environmental documents were being completed, were not evaluated in the Transformation Biological Assessment or the USFWS BO (USACE

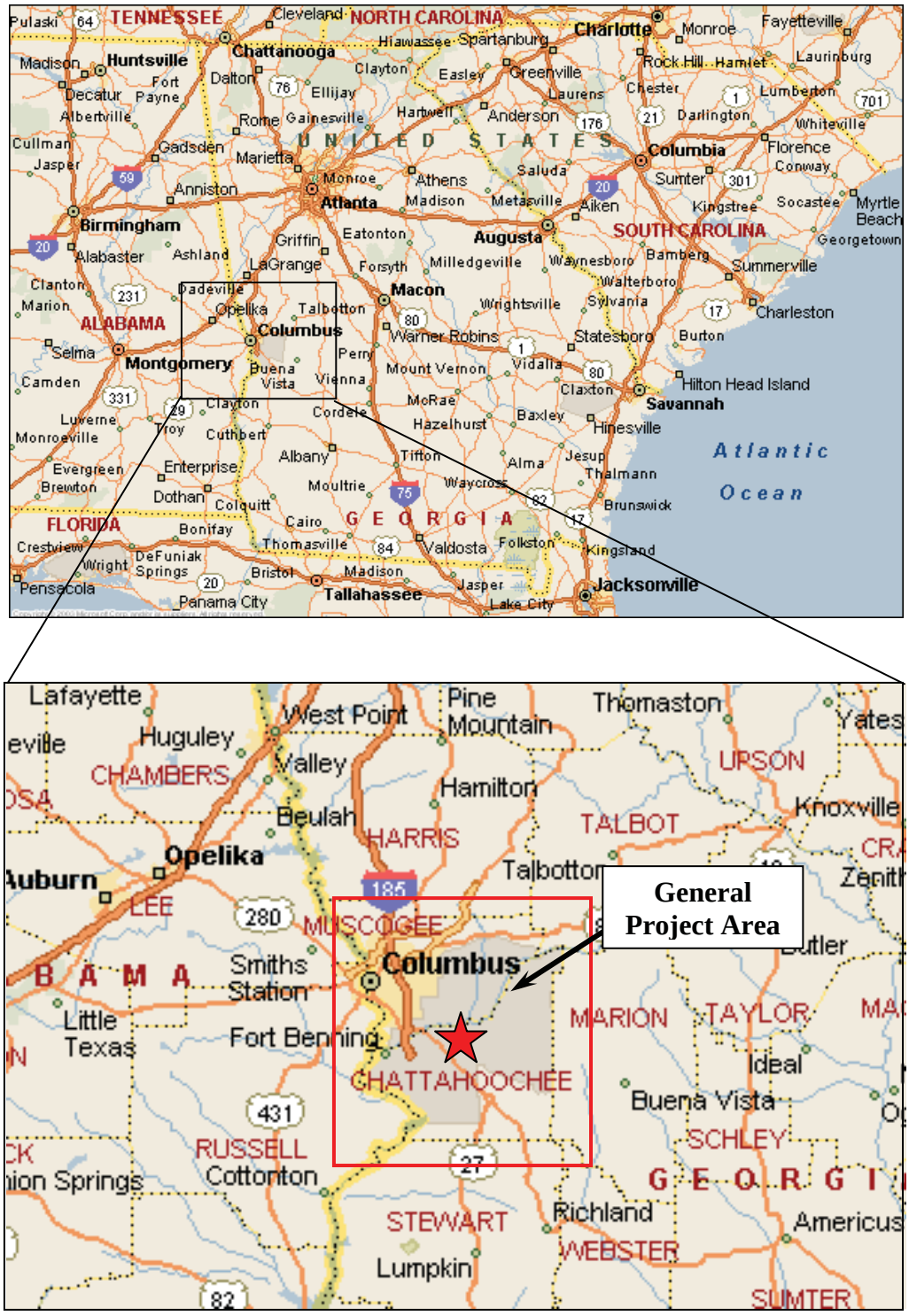


Figure 1-1. General location of the Fort Benning Military Installation near Columbus, Georgia.

2007b, USFWS 2007a) and were only evaluated in the Transformation FEIS for cumulative effects (USACE 2007c). Since the Transformation BO (USFWS 2007a), however, some of these projects have been funded, programmed and/or planned to support the MCOE and therefore need to be analyzed in a new Biological Assessment.

Some new construction and training needs have also been identified for the MCOE due to an increase in personnel and students associated with Grow the Army (GTA or Army Growth) and Global War on Terrorism (GWOT). In 2007, the Army announced its decision to increase its overall size while continuing to restructure its forces in accordance with modular Transformation decisions (USAEC 2007a). The impacts of this growth were analyzed in the Programmatic EIS for Army Growth and Force Structure Realignment (USAEC 2007b) and the Army's decision was formally announced in a ROD in December 2007 (USAEC 2007a), however, impacts to species listed by the USFWS as Federally endangered or threatened ("Federally-listed species" or "listed species") need to be assessed in a Biological Assessment at the installation level. At Fort Benning, this growth will result in increased student numbers, increased training area use and new construction projects.

The "proposed action" (defined in Section 4), therefore, includes construction, operation, maintenance and/ or increased use of facilities and training areas (including assets such as ranges and maneuver areas) to support: projects that were analyzed in the Transformation Biological Assessment, but have substantially changed in location or size; new projects necessary to support the MCOE; and new projects necessary to support the increased number of military personnel and students which are associated with GTA and GWOT missions.

This Biological Assessment is being prepared in accordance with the Endangered Species Act (ESA) Section 7(a)(2), as implemented by 50 Code of Federal Regulations (CFR) Part 402. The proposed action is considered to be a major construction activity under 50 CFR Part 402.12(b) and preparation of this Biological Assessment is therefore required in accordance with the procedures set forth in 50 CFR Part 402.12. One purpose of this Biological Assessment is to evaluate the potential effects of the proposed action on Federally-listed species within the Action Area and, if such effects are likely to be adverse, to serve as the basis for initiating formal consultation with the USFWS. An additional purpose of this document is to reinitiate formal consultation with USFWS on Transformation due to construction projects and training impacts

that have changed to an extent that they meet the conditions described in the "Reinitiation Notice" section of the Transformation BO (USFWS 2007a).

For the MCOE EIS being prepared for this action, 2 action alternatives (Alternatives A and B) were identified that would meet the purpose and need of the Installation. The Army has identified Alternative A as its preferred alternative, which is presented in this document as the proposed action. In order to provide an equal level of impacts analysis for all action alternatives presented in the EIS, Appendix A of this document analyzes the impacts of the MCOE Alternative B actions on species listed as Threatened or Endangered, or proposed for such listing, by the USFWS pursuant to Section 7 of the ESA, as amended. The No Action Alternative is also described in Appendix A.

2. BACKGROUND/ BASELINE MISSION AND OPERATIONS

Fort Benning is the Home of the Infantry and the USAIC/S and prides itself on being one of the world's premier war fighting schools and deployment centers. The Installation consists of 181,275 acres and is located adjacent to the Chattahoochee River in west-central GA and east-central AL (Figure 1-1). The majority of the training facilities and 93 percent (%) of the total land area are in GA, within Muscogee and Chattahoochee Counties. The southwestern corner of the Installation, approximately 12,000 acres, is located in Russell County, AL.

The following "baseline" information includes actions evaluated in the Transformation BO (USFWS 2007a), and represents the conditions on Fort Benning once all Transformation projects are constructed and operational.

2.1. FORT BENNING AND MCOE MISSIONS AND TRAINING

2.1.1. BASELINE MISSION

Fort Benning, upon the establishment of the MCOE, will have 3 broad missions: to provide the nation with the world's best trained Infantry and Armor Soldiers and adaptive leaders imbued with the Warrior Ethos, to provide a power projection platform capable of deploying and redeploying Soldiers, civilians and units anywhere in the world on short notice, and to define required capabilities for the Infantry and Armor to meet the needs of the Future Force. Another mission of the MCOE will be to maintain Infantry and Armor branch integrity within the new MCOE model and ensure that it meets or exceeds the training standards for all Soldier and leader development instruction currently taught at the schools, while continuing to provide the best trained Soldiers in the world to our operating force. Planners from Fort Benning and Fort Knox have developed a comprehensive Campaign Plan outlining the end state and direction for the development of the MCOE. Close coordination between both installations will ensure the highest quality training and quality of life for Soldiers, family members and Army civilians (Fort Benning 2008a).

The units currently stationed at Fort Benning are diverse and consist of varying combinations of mobile mechanized (tracked/ wheeled military vehicles) infantry task forces with task organized armor, mechanized infantry, field artillery and combat engineer assets utilizing both mounted (riding in mechanized vehicles) and dismounted (movement by foot) elements for offensive and defensive engagements.

Fort Benning provides ranges and maneuver training areas principally designed to support the Training and Doctrine Command (TRADOC) mission of initial entry training (IET) for Infantry Soldiers and Officers, Basic and Advanced level Noncommissioned Officer (NCO) and Officer training courses, the Army's Airborne and Ranger schools, and the continued study, testing and development of future joint and combined infantry doctrine, weapon systems, weapons tactics, techniques and procedures. TRADOC units on the Installation include the: 192nd Infantry Brigade (Bde) (formerly the Basic Combat Training Bde); 197th Infantry Bde (formerly the 29th Infantry Regiment (Regt)); 198th Infantry Bde (formerly the Infantry Training Bde); 199th Infantry Bde (formerly the 11th Infantry Regt) and NCO Academy (Table 2-1).

The USAARMS trains Armor and Cavalry Soldiers, NCOs and Officers to fight in full spectrum operations in order to meet the requirements of the Army in the contemporary operational environment. The USAARMS serves as the trainer for the current mounted force and develops the tools for the future mounted force. The USAARMS also trains Marines as M1A1 Tank Crewmen and Tank Mechanics. This training includes basic Military Occupational Specialty training as well as advanced Military Occupational Specialty training for Senior NCOs and Officers. With the movement of the USAARMS, Fort Benning will gain the 16th Cavalry Regt, the 194th Armored Bde (formerly the 1st Armor Training Bde) and the NCO Academy.

Fort Benning also provides the home station training facilities for Forces Command's (FORSCOM's) 3rd Bde of the 3rd Infantry Division (3rd ID) (Mechanized (Mech), which has its Division headquarters at Fort Stewart, GA, Special Operations Command's (SOCOM's) 75th Ranger Regt and numerous other active deployable units. The Western Hemisphere Institute for Security Cooperation (WHINSEC) is also located at Fort Benning, which has the mission to train cadets, NCOs and Officers from various Latin American countries (USACE 2006a). Tenant units moving to Fort Benning as part of Transformation are relatively small in size and are listed in Table 2-1.

Table 2-1. Units stationed at Fort Benning currently and post-Transformation.

CURRENT UNITS:	
USAIS/ TRADOC Units	**Tenant Units**
199th Infantry Brigade (Bde) (formerly 11th Infantry Regiment (Regt.))	3rd Infantry Division, 3rd Bde (Mechanized)
197th Infantry Bde (formerly 29th Infantry Regt)	75th Ranger Regt
192nd Infantry Bde (formerly Basic Combat Training Bde)	11th Engineer (ENG) Battalion (Bn) (Combat), 362nd ENG Company (Multi-Role Bridge)
Combined Arms and Tactics Directorate	WHINSEC
Directorate of Operations and Training (G-3)	Army Marksmanship Unit (AMU)
198th Infantry Bde (formerly Infantry Training Bde)	Criminal Investigation Command (CID)
Office of Infantry Proponency (OIP)	Dental Activity (DENTAC)
Ranger Training Bde (RTB)	Logistic Assistance Office
Non-commissioned Officers (NCO) Academy	Medical Department Activity (MEDDAC)
	U.S. Customs
	U.S. Army Reserve
	U.S. Air Force
	13th Combat Sustainment Support Bn
	Army Research Institute
	14th Combat Support Hospital
	92nd Military Police (MP) Bn

ADDITIONAL UNITS FROM TRANSFORMATION:	
USAARMS/ TRADOC Units	**Tenant Units**
16th Cavalry Regt	81st Regional Readiness Command, 43rd Equipment Concentration Site
194th Armored Bde	3rd MP Group (CID)
NCO Academy	86th MP Detachment
	U.S. Army Audit Agency
	286th MP Det (CID)
	Explosive Ordnance Disposal Company
	Movement Control Team

Sources: USACE 2007a, Fort Benning 2008a and Fort Knox 2008.

2.1.2. PERSONNEL

Prior to carrying out the Transformation actions, the average daily population at Fort Benning consisted of 17,771 military personnel, 8,690 civilian employees and 9,386 students (USACE 2007b). Transformation actions, once completed and operational, are projected to add 5,605 military personnel, 3,771 civilians and/or contractors, and a daily average number of 7,238 students. This will increase the total Fort Benning population (not including family members) to a total of 23,376 military, 12,461 civilian and contractor personnel, and 16,624 students (daily average) (USACE 2007b, 2007c). In addition, a temporary increase in Army end strength, authorized in advance of the Army Growth ROD (USAEC 2007b), has resulted in an estimated maximum increase of 2,640 daily average students at Fort Benning (J.W. Brown, Fort Benning, pers. comm.).

Table 2-2 presents annual student throughput once all Transformation personnel increases are completed.

Table 2-2. Post-Transformation Student Training Throughput

Type of Training	Student Numbers
USAARMS*	
Total Student Input	7,638
Daily Average Load	840*
USAIS	
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

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

2.1.3. TRAINING ASSETS

Fort Benning is comprised of 181,275 acres within the Installation boundary. Dudded impact areas comprise 16,068 acres, or 9% of the total Installation. Fort Benning has the following types of active training facilities (Table 2-3, Figure 2-1) (USACE 2006a):

- basic marksmanship ranges (used to qualify or train on rifles, pistols, sniper rifles, grenade launchers, subcaliber light anti-armor weapons, shotguns, machine guns and grenades).
- direct fire gunnery ranges (used to qualify and train tank and Bradley crews, including ranges used to qualify anti-armor weapons systems using service ammunition).
- collective live fire ranges (used for collective training events, such as Infantry Squad Battle Courses (ISBCs) and Infantry Platoon Battle Courses (IPBCs), multipurpose range complexes and aerial gunnery ranges).
- 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).
- special live fire ranges (ranges and training areas used for qualification and training of demolitions, live hand grenades and claymores).
- 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).

In addition to the facilities listed above and in Table 2-3, there are also 35 drop and/or landing zones on the Installation. Several range projects are currently approved and/or under construction, including an IPBC, a Digital Multi-Purpose Range Complex (DMPRC), a Stationary Tank range and some small-arms ranges (see Sections 3.3.1 and 3.3.2).

The inventory of existing ranges is provided in Table 2-3 along with the average number of days used per year (computed based on average use in fiscal years 2003-2005) and projected use (based on 242 annual training days) (USACE 2006a). The ranges used most heavily were

Table 2-3. Range training inventory and utilization at Fort Benning, including projects evaluated in the Transformation Biological Opinion (USFWS 2007a) that are not being reanalyzed in the proposed action.

Range Title	PN of approved Transformation Projects (where applicable)	Number of Facilities	Average Days Used/ Year	Days Required	Average Days Required/ Facility
Basic Weapons Marksmanship Ranges					
Basic 10/25 meter Firing Range (M16 zero)		7	124	301	43
Rifle/ Machine Gun Zero Range	65037, 65038	(2)	NA	NA	NA
Automated Field Fire Range		1	118	295	295
Automated Record Fire Range Remote Target System		3	162	398	133
Modified Record Fire Range Remote Target System		2	118	179	90
Known Distance Range		4	120	371	93
Sniper Range		1	185	110	110
Nonstandard Small Arms Range		9	101	468	52
Combat Pistol Qualification Course/ Military Police Firearms Qualification Course		1	75	182	182
Multipurpose Machine Gun		1	82	NA	NA
Multipurpose Machine Gun Automated		2	70	303	152
M203 Grenade Launcher Range		2	47	140	70
Fire and Movement Range	65032	(1)	NA	378	378
Modified Record Fire Range	65044, 65045, 65046, 65047 & 65048	(5)	NA	179	36
Direct Fire Gunnery Ranges					
Anti-Armor Tracking and Live Fire Range		3	104	14	5
Field Artillery Direct Fire Range		1	30	11	11
Stationary Gunnery Range		1	46	287	144
Tank/ Fighting Vehicle Stationary Gunnery Range	65382	(1)	NA		
Multipurpose Training Range (Non-Automated)		2	59	NR	NA
Multipurpose Training Range (Automated) Carmouche		1	80	491	491
Aerial Gunnery Range		1	1	NR	NA
DMPRC		(1)	NA	242	242
Collective Live Fire Ranges					
Tank Platoon Battle Run (Cactus/Whitson)		1	36	NR	NA
UAC		2	287	464	232
Shoot House		4[a]	10	232	58
Infiltration Course		1	76	299	299
Fire and Movement		4[b]	115	126	32
Squad Defense Range		1	19	269	269
ISBC (Non-Automated)		1	124	NR	NA
IPBC (Non-Automated)		2	232	216	108
IPBC (Standard)		1	NA	63	63
MOUT Small		2	258	NR	NA
Convoy Live Fire		1	NR	170	170
Combined Arms Collective Training Facility, Phase I		1	NA	132	132
Combined Arms Collective Training Facility, Phase II	62207	(1)	NA		
Indirect Fire Facilities					
Mortar Scaled Range		1	49	NA	NA
Mortar Range/Firing Points		19	123	46	2
Field Artillery Indirect Fire Range		22	101	18	1
Observation Bunker		1	238	NA	NA

Table 2-3 (cont'd.). Range training inventory and utilization at Fort Benning, including projects evaluated in the Transformation Biological Opinion (USFWS 2007a) that are not being reanalyzed in the proposed action.

Range Title	PN of approved Transformation Projects	Number of Facilities	Average Days Used/ Year	Days Required	Average Days Required/ Facility
Special Live Fire Ranges					
Hand Grenade Familiarization Range		1	49	306	306
Light Demolition Range		4	35	180	45
Other, Non-Live Fire Facilities					
Rotary Wing Runway Unsurfaced		31	53	NA	NA
Nuclear, Biological, Chemical Chamber		2	91	259	130
Bayonet Assault Course		1	NA	270	270
Target Detection Range		3	73	NA	NA
Hand-to-Hand Combat Pit		3	NA	348	116
Confidence Course		3 [c]	37	179	NA
Leadership Reaction Course		1	70	19	19
Tracked Vehicle Drivers Course		1	NA	275	275
Tracked Vehicle Recovery Specialist Course		1	NA	225	225
Amphibious Vehicle Training Area		1	53	NA	NA
Combat Trail		1	98	42	42
Rappelling Training Area		1	53	86	86
Obstacle Course		1	NA	384	384
Land Navigation Course		4	53	314	79

Notes: a. Construction on two of the four shoot houses was recently completed; utilization data are not available for inclusion.

b. One of the Fire and Movement Ranges is inactive.

c. Utilization data were unavailable for two of the three confidence courses.

d. Maneuver/ training area requirements are calculated based on km^2 days required.

For light forces, 141,581 km^2 are required. For heavy forces, 155,909 km^2 are required.

( ) = Transformation project not being reanalyzed.

NA = not available

NR = not a requirement

Source: USACE 2006a; USACE 2007a

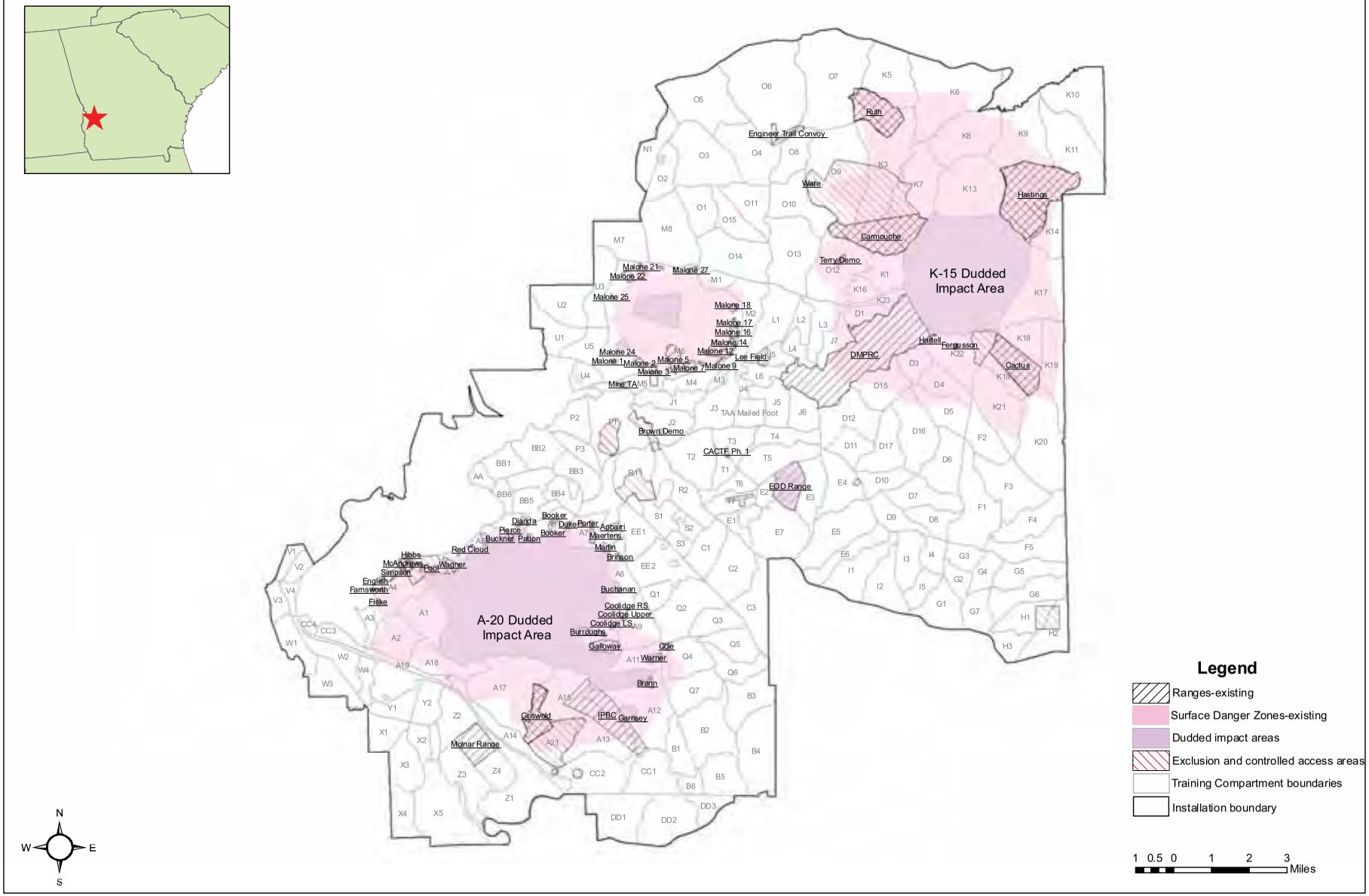


Figure 2-1. Location of existing ranges, dudded impact areas, exclusion areas and training compartments on Fort Benning.

the Urban Assault Course, small Military Operations in Urban Terrain (MOUT), and non-automated IPBC. According to the Range Training and Land Program (RTLP) Development Plan (RDP) (USACE 2006a), overall utilization of range facilities was relatively steady for FY 2004 and FY 2005, but increased in FY 2006 based on utilization data for the first half of FY 2006 and projected utilization for the remainder of the year. These utilization rates were greatly affected by wartime deployments during these years. Projections of future requirements more accurately reflect baseline demand, but also include projected USAARMS requirements. When this information was analyzed in context of projected range throughputs and range capacities, shortfalls were identified in the RDP. Many of these shortfalls resulted because Fort Benning requires standard, modernized ranges for improved training in order to meet their current mission requirements (USACE 2006a).

The equipment used by current and relocating units/ organizations at Fort Benning include M1A1 tanks, Bradley Fighting Vehicles (BFVs), Strykers, High Mobility Multipurpose Wheeled Vehicles (HMMWVs), trucks and trailers for operational needs as well as maintenance instruction (Table 2-4).

Once Transformation actions are carried out, the following vehicles will be in use at Fort Benning:

Table 2-4: Vehicle inventory at Fort Benning

Vehicle	Type	Fort Benning Existing	USAARMS Existing	Percent (%) Increase
Tracked Armor Equipment	Includes tanks, armored personnel carriers, BFVs, recovery vehicles, tanks with assault bridges and mine clearers	201	480	238.8 %
Wheeled Heavy Equipment	Stryker, HMMWVs (carriers, cargo, armament and heavy weight trucks)	328	390	118.9 %
Wheeled Heavy Trucks	Heavy cargo equipment transport, fuel tankers and recovery vehicles	141	66	46.8 %
Wheeled Trailers	Low-bed trailers for armaments, water and utility towing	216	72	33.3 %
Wheeled Medium/ Light Trucks	Fork lifts, cargo and general personnel carriers	193	89	46.1 %
	Total Vehicles	**1,079**	**1,097**	**101.7%**

Source: C. Stoinoff, USAARMS, pers. comm.). As of August 2008.

In addition to the vehicles listed in Table 2-4, the two Reserve Component Facilities (PN 64491 and PN 65405) in the Transformation BO (USFWS 2007a) will add 1250 vehicles on Ft. Benning: 66 tracked and 1184 wheeled. Of the wheeled, 545 will be heavy wheeled equipment other than trucks, 190 will be heavy trucks, 225 will be trailers, and 224 will be light/medium Trucks. None of this equipment will be used in the training areas on Fort Benning. It will be maintained and stored for use by Reserve Component units that train at other installations.

2.1.4. TRAINING LAND

Types of training conducted in the training compartments on Fort Benning include dismounted (foot traffic only), wheeled (any wheeled vehicles including HMMWV's and Strykers) and tracked (includes wheeled or tracked vehicles such as BFV's and tanks).

Maneuver training occurs only in areas designated for that purpose. Maneuver occurs on and off roads depending on a vehicles' ability to move across the existing topography. Maneuver lands are designated for either light or heavy use, however, heavy maneuver lands can be used for light maneuver when available.

Light maneuver lands are used to train dismounted Soldiers from the individual Soldier level through the unit level (up to 220 Soldiers). Tracked vehicles can travel on existing and established roads designed for or identified specifically for tracked vehicle use in light maneuver areas, but off-road traffic is limited to wheeled vehicles only.

Heavy maneuver lands are used to train armored fighting vehicle crewmen in units ranging from individual crews in a single vehicle to multiple company-sized units of up to 60 vehicles, of which 24 are tracked and weigh up to 70 tons (including BFVs and tanks).

2.1.5. HEAVY MANEUVER TRAINING

In the following discussion and throughout this document, the following terminology is used for describing areas used for heavy maneuver training:

Heavy maneuver land-	The total area on Fort Benning that may be used for heavy maneuver training
Maneuver Areas-	Areas and/ or corridors within the heavy maneuver land where training exercises will be concentrated

and where efforts to upgrade and construct roads and tank trails will be focused.

Maneuver heavy use areas- Areas within the Maneuver Areas that are expected to receive the highest amount of use.

Prior to implementation of Transformation projects , 86 training compartments (62,958 acres) were designated for heavy maneuver training and 83 (48,171 acres) were designated for light maneuver (USACE 2006a). These totals, however, include restricted areas such as controlled access areas, exclusion areas and ranges, which are used for training activities that are incompatible with maneuver training activities. Exclusion areas are defined as areas where routine foot or mounted traffic is not allowed and are intended to defend the infrastructure, equipment, and resources of that area from tampering or incidental damages. In the northern training areas, restricted areas include Ruth, Hastings, Carmouche, Cactus and Concord Ranges; the DMPRC; Camp Darby; Malone MOUT; the railroad head at Ochillee Junction; and McKenna MOUT. In the southern training areas, restricted areas include the Kunzig Range Complex and portions of the Dixie Road Range Complex (Figure 2-1).

In addition to restricted areas, use of training land within range surface danger zones (SDZs) is closed to all personnel not directly using the range complex during ongoing exercises. When range complexes are not in active use, areas within SDZs are accessible for other compatible land uses such as training, maintenance and land management activities. The SDZ is an "invisible" line that surrounds the firing range and ordnance impact area portions of a range and is a safety zone for personnel on or in the vicinity of the range. Its function is to provide a buffer zone that accounts for projectiles, fragments, debris and components resulting from the firing of weapon systems; these items have an approximately one in a million chance of landing outside of the SDZ (Fort Benning 2004a). SDZs differ in size and configuration depending on the type of activity occurring on the range (e.g., small arms training versus tank gunnery), the location of the firing positions and the type of ammunition being fired on the range (AR 385-63, 2003). SDZs are further explained in Section 5.2.

With the establishment of the Good Hope Maneuver Area as part of Transformation and excluding dudded impact areas and restricted areas, approximately 84,925 acres are available for

heavy maneuver training. When SDZs of all existing ranges and approved Transformation ranges are subtracted, there are 64,560 acres available for heavy maneuver (Figures 2-1 and 2-2).

2.1.6. HEAVY MANEUVER TRAINING REQUIREMENTS

Partially in preparation for Transformation, Fort Benning completed a RDP in 2006 (USACE 2006a). One purpose of the study was to identify the heavy maneuver training requirements of the USAIC/S and USAARMS programs of instruction (POIs).

Heavy maneuver requirements were calculated in terms of square kilometer days (km^2 days) using methodology from TC 25-1, which takes into account the area needed to complete a task, the number of units involved, the number of days per task and the number of iterations conducted per year. An example is shown below:

Area (km^2)	x	Number Iterations	x	Days/ Iteration	x	Number Units	=	km^2 days
24		4		2		6		1,152

Using the current POI requirements for tenant units at Fort Benning, the study indicated that the 3rd Bde currently has a heavy maneuver requirement of 70,568 km^2 days. The majority of this training has occurred within the proposed Southern Maneuver Area and the area of the DMPRC prior to its construction (Figure 2-3). Further, the study determined that the heavy maneuver requirements to support the USAARMS POIs totaled 105,425 km^2 days (USACE 2006a). Maneuver training requirements would therefore increase to a total of 175,993 km^2 days, an increase of 149%, upon the arrival of the USAARMS.

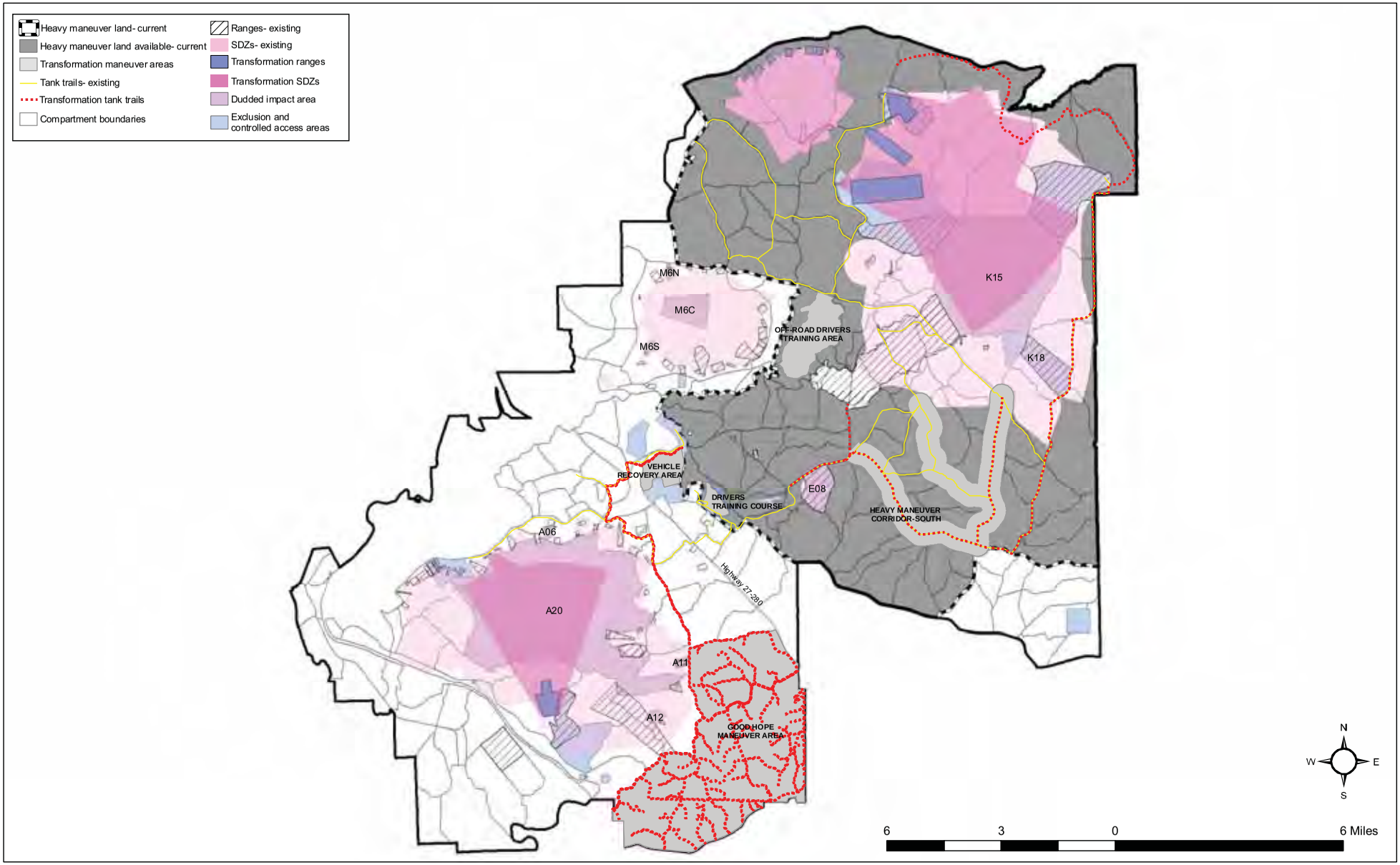


Figure 2-2. Heavy maneuver land usage, excluding surface danger zones (SDZs), impact areas and other exclusion areas once Transformation projects are implemented, Fort Benning.

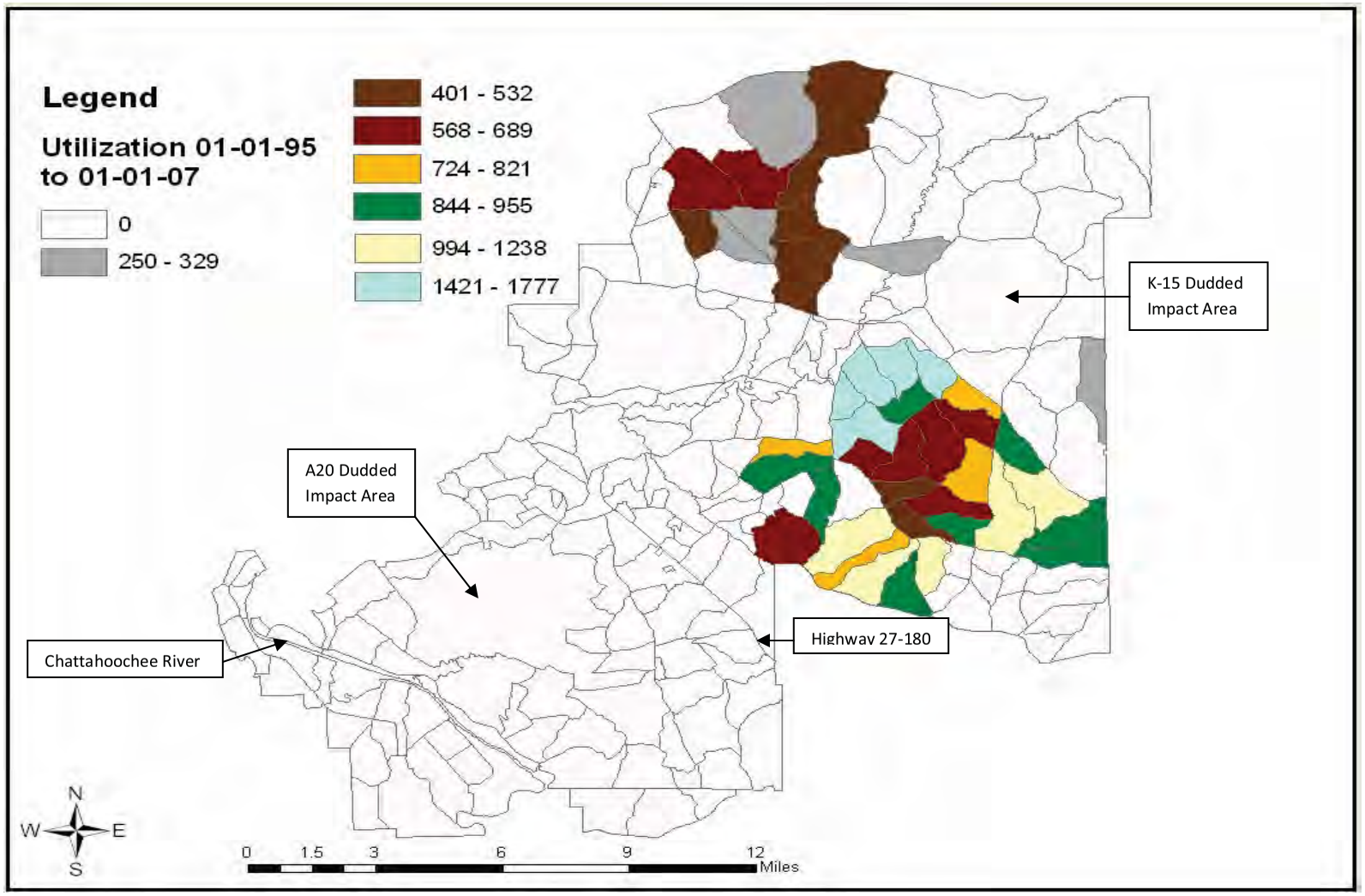


Figure 2-3. Heavy Maneuver Land Utilization between 1 January 1995 and 1 January 2007, shown in total number of training days.
Source: Fort Benning Range Division, pers. comm..

2.2. INITIATIVES DRIVING THE PROPOSED ACTION

Background information for the initiatives associated with the proposed action is presented below.

2.2.1. BASE REALIGNMENT AND CLOSURE

The US Department of Defense (DoD) is reorganizing installation infrastructure, doctrine and force structure in order to support more efficiently and effectively its force structure and increase operational readiness through the BRAC process. On 8 September 2005, the Defense Base Closure and Realignment Commission ("BRAC Commission") recommended a set of domestic realignment and closure actions, including those "BRAC" actions addressed in the Transformation Biological Assessment (BRAC Commission 2005). These recommendations were approved by the President on 15 September 2005 and were sent forward to Congress. Congress did not make any alterations to the recommendations, and on 9 November 2005 the recommendations became law (DoD 2006). The Defense Base Closure and Realignment Act of 1990 requires that all BRAC closures and realignments must be initiated no later than 2 years after the date the President transmits the BRAC Commission's report to Congress (Sec. 2904 (a)(3), Public Law (PL) 101-510, as amended). All such closures and realignments must be completed within 6 years of that same date (Sec. 2904(a)(4), PL 101-510, as amended). Therefore, the BRAC actions at Fort Benning must be initiated no later than 15 September 2007 and completed no later than 15 September 2011.

Of the BRAC actions, the greatest environmental impacts will result from the movement of the USAARMC/S from Fort Knox, KY to be combined with the USAIC/S already based at Fort Benning.

The 2005 BRAC-directed actions were evaluated in the Transformation BO and ROD (USFWS 2007a, USACE 2007a), however, 10 BRAC-directed projects have changed substantially and are being reanalyzed as part of the proposed action (see Sections 2.4.10, 3.3.2 and 4.2.1). In addition, 1 project that was previously analyzed as an AMF project is being reanalyzed as a BRAC project.

In addition, 11 new projects are included in the proposed action were not BRAC-directed, but are necessary to support BRAC and MCOE initiatives (see Section 4.2.2).

2.2.2. ARMY MODULAR FORCE

In October 1999, the Chief of Staff introduced what is now termed the AMF initiative (USACE 2002). Using this initiative, the Army is transitioning from a division-based organization to a modular brigade-based organization. The resultant combat arms brigades will be task organized with combined arms capabilities, whereas supporting brigades will have standardized headquarters, but variable subordinate units (Eastin 2006).

The transformation of Army forces responds to the Army's need to become more strategically responsive and dominant at every point in the spectrum of operations. In March 2002, the Army published its *Programmatic Environmental Impact Statement for Army Transformation* for its proposal to conduct a multiyear, phased and synchronized program of transformation (USACE 2002). This EIS covers a series of activities affecting virtually every aspect of Army doctrine, training, leadership development, organizations, installations, materiel and Soldiers occurring over a 30-year time period. On 11 April 2002, the Army issued a ROD reflecting its intent to transform the Army (USACE 2002).

The AMF actions at Fort Benning were evaluated in the Transformation BO and ROD (USFWS 2007a, USACE 2007a). One project, the Multipurpose Machine Gun (MPMG) Range 2 (Project Number (PN) 65070), has changed substantially and is being reanalyzed as part of the proposed action. It is now primarily driven by BRAC initiatives (see Sections 2.4.10 and 4.2.3).

2.2.3. GLOBAL DEFENSE POSTURE REALIGNMENT

The reshaping of the domestic military infrastructure includes providing basing for the return of units currently based overseas.

At the request of the Chairman of the Joint Chiefs of Staff, combatant commanders submitted a series of recommendations for overseas basing plans for their respective areas of responsibility. The recommendations were part of an interagency assessment of the DoD's long-term overseas force projection and basing needs. The assessment resulted in a series of recommendations which provided the blueprint outlining the size, character and location of long-term overseas forces presence. On the basis of the GDPR results, the Secretary of Defense announced that some forces currently based overseas will return to the US over a period of years (Commission on Review of Overseas Military Facility Structure of the United States 2005). The

2005 BRAC recommendations take into account and adopt some of the basing recommendations of the GDPR.

An increase in personnel associated with this initiative was addressed in the Transformation Biological Assessment, however, no projects specifically for the GDPR were proposed (USACE 2007a). There is one construction project associated with GDPR that is part of the proposed action, the Unit Maintenance Facilities (PN 69406) (Section 4.2.4).

2.2.4. GROW THE ARMY, GLOBAL WAR ON TERRORISM AND ARMY POWER PROJECTION PLATFORM

In January 2007, the President requested from Congress a 74,200 Soldier increase in Army end strength across the Active, Guard and Reserve components. The initiative to "Grow the Army" will provide additional ground forces to meet strategic demands, mitigate persistent capability shortfalls and reduce stress on Soldiers and their families. The types of organizations the Army will grow are Infantry Brigade Combat Teams (IBCTs), Support Brigades, Combat Support and Combat Service Support units. To support these IBCTs and Support Brigades the Army has simultaneously announced the stationing of approximately 30,000 Soldiers in Combat Support and Combat Service Support units throughout the United States as well as various overseas locations (US Department of the Army (DA) 2008).

The permanent increase, which is being implemented in accordance with Congressional authorizations, will realign the Army size and configuration (e.g., modular forces) to a force that is capable of meeting national security and defense objectives, implements Quadrennial Defense Review recommendations, sustains unit equipment and training readiness and eases the deployment burden on its Soldiers and families (USAEC 2007a). The impacts of this growth were analyzed in the Programmatic EIS for Army Growth and Force Structure Realignment (USAEC 2007b) and the Army's decision was formally announced in a ROD in December 2007 (USAEC 2007a).

Army Power Projection Platforms (AP3s) are Army installations that strategically deploy one or more high priority active component brigades or larger units, and/or mobilize and deploy high priority Army reserve component units. Fort Benning is considered to be an AP3 (GlobalSecurity.org. 2008).

Six of the proposed MCOE projects are to support Army Growth (see Section 4.2.5), one project is proposed specifically for the GWOT (4.2.6) and one project will support Fort Benning's AP3 mission (Section 4.2.1.2).

2.3. APPLICABLE ENVIRONMENTAL LEGISLATION, REGULATIONS AND AGREEMENTS

Environmental documents, agreements and legislation pertinent or applicable to this Biological Assessment include:

2.3.1. ENDANGERED SPECIES ACT

In accordance with Section 7(a) (2) of the ESA, a federal agency (in this case, the Army) must consult with the Secretary of the Interior to ensure that implementation of a proposed action is not likely to jeopardize the continued existence of any Federally Threatened or Endangered species, or result in the destruction or adverse modification of any designated Critical Habitat for Threatened or Endangered species.

A written Biological Assessment is required for all major construction activities prior to a Federal agency authorizing, funding or implementing actions. The purpose of the Biological Assessment is for the action agency to determine how the proposed action may affect a Federally-listed species or designated Critical Habitat. If the Biological Assessment results in a determination that the action "may affect" and "is likely to adversely affect" a Federally-listed species or designated Critical Habitat, formal consultation is required. The contents of the Biological Assessment are discretionary; however, if it is to be used to initiate formal consultation it must at a minimum contain descriptions of the following: (a) the proposed action; (b) the area likely to be affected; (c) listed species that may be affected; (d) the manner in which such species may be affected; (e) non-federal cumulative effects; (f) relevant reports and studies; and (g) any other available information relevant to the action, species and effects (USFWS and National Marine Fisheries Service (NMFS) 1998).

Formal consultation for non-jeopardy or jeopardy BOs involves up to a 90-day consultation period and an additional 45-day period for the USFWS to prepare a BO (135 days total). These time frames may be extended by agreement. 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 listed species or its Critical Habitat. The BO, in addition to discussing the information upon which it is based, must also disclose the direct, indirect and cumulative effects of the action on listed species. It must determine whether the overall effect is likely to jeopardize the continued existence of a listed species and, if jeopardy is determined, offer reasonable and prudent alternatives for the agency to implement while avoiding jeopardy to the species.

Section 9 of the ESA prohibits the Take of any individual of a species listed as Endangered or Threatened (by rule). If the USFWS's determination is non-jeopardy, but the proposed action is expected to result in Incidental Take (referred to herein as "take") of a Federally Threatened or Endangered species, except for plant species, an Incidental Take Statement authorizing Take must be included in the BO. USFWS defines Take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect [Federally-listed species] or attempt to engage in any such conduct." "Harm" is further defined to mean significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Incidental Take is defined as any Take that "results from, but is not the purpose of, carrying out an otherwise lawful activity..." (USFWS and NMFS 1998). In addition to specifying the amount of Incidental Take allowed, the statement must include reasonable and prudent measures (RPMs), implemented by mandatory terms and conditions, to minimize impacts to the listed species. Incidental Take Statements are issued for the specific action and the type of "take" expected (ESA, Section 7(b)(4)). Any "take" that occurs in compliance with the terms and conditions specified in an Incidental Take Statement is exempt from Section 9's Take prohibition. (ESA, Section 7(o)(2). The BO establishes situations requiring re-initiation of formal consultation, including exceeding or reducing the level of authorized "take." In addition, it lists discretionary conservation recommendations the action agency can implement to meet its duty to conserve listed species under Section 7(a)(1) of the Act (USFWS and NMFS 1998). Although Incidental Take is not issued for plants, the USFWS still makes a jeopardy determination and issues RPMs to reduce impacts to listed plant species.

If the USFWS's determination is that the action is likely to jeopardize the continued existence of one or more federally-listed species and/or result in adverse modification of designated Critical Habitat, a Jeopardy BO (JBO) will be issued. The USFWS will include

reasonable and prudent alternatives (RPAs) to the proposed action that, if implemented, would avoid a jeopardy situation. These RPAs are developed during the formal consultation period with involvement of the action agency. If no alternative to the action can be developed that would avoid jeopardy and/ or adverse modification of Critical Habitat, no Incidental Take Statement will be issued and any Incidental Take resulting from the proposed action will be prohibited. If one or more RPAs are included in the JBO, it will include an Incidental Take Statement that will provide separate estimates of anticipated "take" for each RPA presented, along with appropriate RPMs and conservation measures, under the premise that one of the RPAs would be implemented *instead of* the proposed action. Once a Jeopardy Biological Opinion is delivered, the action agency then has a choice of whether to a) adopt 1 of the RPAs instead of their original proposed action, b) decide not to undertake the action, c) request an exemption from the Endangered Species Committee, d) reinitiate the consultation by proposing a modified action or offering a different RPA or e) proceed with the action if it believes said action satisfies conditions of section 7(a)2 of the Endangered Species Act (USFWS and NFMS 1998).

2.3.2. USFWS RED-COCKADED WOODPECKER (RCW) (*PICOIDES BOREALIS*) POLICIES AND GUIDANCE

The 2003 RCW Recovery Plan (Recovery Plan) (USFWS 2003a) established guidelines, protocols and policies for the management, monitoring and recovery of the RCW. The Recovery Plan established a recovery goal and designated Fort Benning as a Primary Core Recovery Population. Since approval of the Recovery Plan, the USFWS has issued additional guidance on the determination of Incidental Take and the information required in Biological Assessments, which includes up to 5 levels of analysis for projects impacting RCWs: foraging partition (or "cluster"), group, neighborhood, population and recovery unit analyses (USFWS 2005). Although the USFWS makes the ultimate decision of how much Incidental Take to include in a BO, in order to adhere to the 2005 guidance, the action agency must make a determination of whether Incidental Take is anticipated at each of the levels of analysis listed above in order to determine whether the next level of analysis is necessary (USFWS 2005). In this document, clusters adversely impacted by the proposed action and for which Incidental Take is expected are referred to as "takes." The decision to include these clusters in an Incidental Take Statement in the BO, however, is at the USFWS's discretion.

Additional guidance and clarifications distributed by USFWS since the Recovery Plan address the use of the USFWS RCW Foraging Habitat Matrix software (Matrix) for foraging habitat analyses (FHAs) (USFWS 2006a) and protocols for monitoring the effect of traffic on nesting RCWs (USFWS 2006b).

2.3.3. FORT BENNING NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)/ESA REVIEW PROCESS (NEPA PROCESS)

Every action with a potential to affect human health and the environment (e.g., training exercises, timber operations or construction) is required to be analyzed by the submission and completion of a Fort Benning Form 144-R, Request for Environmental Analysis (REA) (FB Form 144-R) to the Environmental Management Division (EMD), Directorate of Public Works (DPW). The submittal of Fort Benning's REA constitutes the first step in NEPA and ESA compliance at Fort Benning. This NEPA process provides the necessary environmental analysis required to establish that the proposed actions are eligible for categorical exclusions and provides a Record of Environmental Consideration (REC) in accordance with Army NEPA Regulations. This process also determines if proposed actions require further NEPA or ESA analysis and the preparation of an Environmental Assessment (EA) or EIS and Biological Assessment. This process is discussed in greater detail in Section 8, as well as the scenarios that cannot be approved with a FB Form 144R.

2.3.4. SIKES ACT, 16 U.S.C. 670A

Army Regulation 200-1, Environmental Protection and Enhancement requires that identified installations develop and implement an Integrated Natural Resource Management Plan (INRMP) in accordance with 16 USC 670A in cooperation with the USFWS and the appropriate State fish and wildlife agency. This law sets forth responsibilities, policies and procedures to wisely use, scientifically manage and systematically restore renewable natural resources existing on Army lands consistent with the local military mission, national security and current Federal laws pertaining to renewable natural resources and the quality of the environment (DA 1995). This regulation requires the development of an Endangered Species Management Component (ESMC) to the INRMP. ESMCs were formally called Endangered Species Management Plans (ESMPs).

2.3.5. INRMP AND ESMPS

Fort Benning currently has ESMPs for the RCW, bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*), American alligator (*Alligator mississippiensis*) and relict trillium (*Trillium reliquum*), which are appendices to the Installation's INRMP. The INRMP was approved on 30 September 2001 with the final RCW ESMP added upon its completion and approval. The INRMP brings together in 1 document all of the plans and information relating to natural resources management at Fort Benning. It is designed to serve as the comprehensive repository of planning information and management theory and practice. Its underlying purpose is to ensure that natural resource conservation measures and military activities on Fort Benning training land and cantonment areas are integrated and are consistent with Federal stewardship requirements.

The USFWS issued a BO on the RCW ESMP (USFWS 2002), which approved use of the 1996 Management Guidelines for the Red-cockaded Woodpecker on Army Installations (1996 Army Guidelines) (DA 1996) on Fort Benning. This superseded a 1994 JBO that, among other restrictions, bound Fort Benning to the stricter 1994 Army Guidelines. BOs were not necessary on the ESMPs for the other listed species.

2.3.6. 1996 ARMY GUIDELINES

The 1996 Army Guidelines (DA 1996) apply to all Army installations where the RCW occur and establish baseline standards for RCW management on which each installation's RCW ESMP is developed. The Guidelines address setting installation RCW population goals, training restrictions, habitat monitoring and management, and RCW monitoring and management (DA 1996). Training restrictions established in the 1996 Guidelines are presented in Table 2-5.

2.3.7. 2007 ARMY GUIDELINES

The 1996 Guidelines were recently updated to incorporate the Revised RCW Recovery Plan (USFWS 2003a) and updated scientific data. These guidelines were evaluated in a BO in 2007 (USFWS 2007b). Installations are now required to revise their INRMPs with an Endangered Species Management *Component* (ESMC) (ESMPs are termed ESMCs in the 2007 Guidelines) in order to reflect the new RCW/ military training guidance provided in the 2007 Guidelines. The new guidelines may be implemented upon approval of installation ESMCs through formal

Table 2-5. Training activity permitted within marked red-cockaded woodpecker (RCW) buffer zones according to the 1996 and 2007 Army RCW Guidelines (DA 1996, 2007).

	Allowed within 200 ft. of marked cavity tree?
MANEUVER AND BIVOUAC:	
HASTY DEFENSE, LIGHT INFANTRY, HAND DIGGING ONLY (2 HOURS MAXIMUM)	YES
HASTY DEFENSE, MECHANIZED INFANTRY/ARMOR	NO
DELIBERATE DEFENSE, LIGHT INFANTRY	NO
ESTABLISH COMMAND POST, LIGHT INFANTRY	NO
ESTABLISH COMMAND POST, MECHANIZED INFANTRY/ARMOR	NO
ASSEMBLY AREA OPERATIONS, LIGHT INFANTRY/MECH INFANTRY/ARMOR	NO
ESTABLISH CS/ CSS SITES	NO
ESTABLISH SIGNAL SITES	NO
FOOT TRANSIT THRU THE COLONY	YES
WHEELED VEHICLE TRANSIT THRU THE COLONY (1)	YES
ARMORED VEHICLE TRANSIT THRU THE COLONY (1)	YES
CUTTING NATURAL CAMOUFLAGE, HARDWOOD ONLY	YES
ESTABLISH CAMOUFLAGE NETTING	NO
VEHICLE MAINTENANCE FOR NO MORE THAN 2 HOURS	YES
WEAPONS FIRING:	
7.62mm AND BELOW BLANK FIRING	YES
0.50 CAL BLANK FIRING	YES
ARTILLERY FIRING POINT/ POSITION	NO
MLRS FIRING POSITION	NO
ALL OTHERS	NO
NOISE:	
GENERATORS	NO
ARTILLERY/ HAND GRENADE SIMULATORS	YES
HOFFMAN TYPE DEVICES	YES
PYROTECHNICS/ SMOKE:	
CS/RIOT AGENTS	NO
SMOKE, HAZE OPERATIONS ONLY, GENERATORS OR POTS (2)	YES
SMOKE GRENADES	YES
INCENDIARY DEVICES TO INCLUDE TRIP FLARES	NO
STAR CLUSTERS/ PARACHUTE FLARES	YES
HC SMOKE OF ANY KIND	NO
DIGGING:	
TANK DITCHES	NO
HASTY INDIVIDUAL FIGHTING POSTIONS, HAND DIGGING ONLY, FILLED AFTER USE	YES
DELIBERATE INDIVIDUAL FIGHTING POSITIONS	NO
CREW-SERVED WEAPONS FIGHTING POSITIONS	NO
VEHICLE FIGHTING POSITIONS	NO
OTHER SURVIVABILITY/ FORCE PROTECTION POSITIONS	NO
VEHICLE SURVIVABILITY POSITIONS	NO

NOTES:

1. Vehicles will not get any closer than 50 feet of a marked cavity tree unless on existing roads, trails or firebreak.

2. Smoke generators and smoke pots will not be set up within 200 feet of a marked cavity tree, but the smoke may drift through the 200 feet circle around a cavity tree.

consultation with USFWS (DA 2007). A draft version of Fort Benning's INRMP is complete, however, due to the magnitude of changes expected from Transformation and the proposed action, a delay in revision of the RCW ESMC was approved. The revised INRMP and RCW ESMC are expected to be completed in 2009.

Restrictions established in the 2007 Guidelines are the same as those described in the 1996 Guidelines for populations with <250 RCW potential breeding groups (PBGs); however, the 2007 Guidelines allow the incremental removal of training restrictions on clusters as installations exceed 250 PBGs. While the 2007 revisions to the Army RCW Management Guidelines may relax training restrictions as populations exceed established PBG thresholds, habitat management practices must continue to be implemented for all RCW clusters (DA 2007). Many of the training restrictions in the 1996 Guidelines remain the same in the 2007 Guidelines. In this Biological Assessment, where the training restrictions being discussed are included in both sets of Guidelines, they are collectively referred to as the **"Army RCW Guidelines (DA 1996, 2007)."**

2.3.8. LAND EXCHANGE

A land exchange between Fort Benning and the City of Columbus (City) was finalized in 2001 (Land Exchange). Development of the City property, the Muscogee Technology Park (MTP), would result in the Incidental Take of RCW Cluster N02-01. Successful RCW occupation of 1 of 4 recruitment sites that were created on Fort Benning was required in the USFWS BO for the Land Exchange in order to compensate for this Incidental Take (USFWS 1998), however 2 were occupied (Clusters E08-04 and O14-03) in March 1999 (JCA 2000). The remaining 2 recruitment clusters (HCC-03 and O09-04) also became active in later years, but were subsequently impacted by Transformation projects and were included in the Incidental Take Statement for that project (USFWS 2007a).

Fort Benning's environmental obligations resulting from the Land Exchange included the management of foraging habitat for RCW Clusters N01-02 and N02-02, near the northwestern boundary of the Installation (USFWS 1998). Because foraging habitat was insufficient on Fort Benning alone to support these clusters after the Land Exchange, the City designated enough area on the MTP as "protected areas" to provide the necessary habitat. The Memorandum of Agreement (MOA) and the restrictive covenants for the MTP (US Army and the Consolidated

Government of Columbus 1999), as well as a RPM in the Land Exchange BO, state that Fort Benning will provide and manage foraging habitat for these 2 clusters so there will ultimately be sufficient foraging habitat on the Installation. Once foraging habitat is sufficient on Fort Benning alone, the City will be able to clear and develop the protected areas. Until that time, any clearing or development of land within the Protected Areas cannot bring foraging habitat below the current applicable RCW guidelines (US and Consolidated Government of Columbus 1999). As an additional minimization effort, Fort Benning also increased its installation RCW population goal from 350 to 351 PBGs.

2.3.9. DMPRC ROD AND BO

A ROD for a Final EIS and a BO were completed in 2004 for a DMPRC (Fort Benning 2004a, USFWS 2004, DA 2004, USFWS 2006c). This range is currently under construction and is expected to be operational by 2010 (F. Weekley, Fort Benning, pers. comm.). The loss of up to 8 managed RCW clusters as a result of range construction and operation was offset by managing 8 clusters in the A20 dudded Impact Area, per an RPM in the DMPRC BO (USFWS 2004, DA 2004, Fort Benning 2005, USFWS 2006c). In order to study the impacts of range construction and operation on RCW foraging habitat use, home range and dispersal, Fort Benning is also conducting "home range follows" at 11 RCW clusters adjacent to the range. This entails following the RCW groups inhabiting these clusters regularly from sunrise to 3 pm and recording group location and behavior at regular intervals (every 30 minutes). Because the DMPRC was a large introduced clearing (approximately 1,500 acres) and such openings can have a detrimental effect on RCW dispersal and demographic stability (see Section 6.8.3), an additional 30 clusters within the RCW neighborhood (defined in Section 3.2) are monitored in order to document effects of habitat fragmentation. (Activities conducted at managed and monitored clusters are described in Section 6.8.2). Many of the clusters or groups currently being managed, monitored and/ or followed as minimization for the DMPRC will be affected by Transformation projects and the proposed action; these are noted in the impacts analyses in Section 6.

2.3.10. BRAC 2005 AND TRANSFORMATION ROD AND BO

As discussed in the Introduction, a non-jeopardy BO was issued on 20 August 2007 for the preferred alternative described in the Transformation Biological Assessment (USFWS 2007a, USACE 2007b). The ROD was signed in November 2007 (USACE 2007a). **Note: unless otherwise indicated, all references to the Transformation environmental documents herein refer to the preferred, approved Action Alternative.** These documents assessed 41 cantonment projects, 20 range projects, 5 infrastructure and road projects and 3 heavy maneuver training areas. The status of these projects is described in Section 3.3.2. As discussed previously in Section 1, 16 of the projects assessed in the Transformation BO (USFWS 2007a) have changed to such a degree that reanalysis of project impacts in this Biological Assessment is warranted (Table 2-6).

In order to minimize the extent of Incidental Take of RCWs, the Transformation BO included RPMs that required: 1) development of an Installation Land Management Plan and Transformation/ BRAC Access Plan, 2) construction of berms for 3 Transformation Oscar Range projects and 3) subdivision of the Installation training compartments to facilitate co-location of training exercises and timber and management activities. In addition, RPMs regarding RCW monitoring and reporting included 4) submittal of timber operation and habitat monitoring reports, 5) a RCW Demographic Monitoring Plan, 6) a RCW Translocation Monitoring and Implementation Plan for clusters impacted by Transformation projects, 7) demographic monitoring of all managed RCW clusters within 0.5 mile of Transformation projects/ activities and 8) quarterly and annual reports that provide overviews of the effects Transformation/ BRAC has had on the RCW and its habitat (USFWS 2007a).

Actions Fort Benning has taken to meet these RPMs and other BO requirements include, but are not limited to, the following:

RCW Translocation Monitoring and Implementation Plan (Translocation Plan): This Plan was submitted to the USFWS on 25 September 2007 and was approved by USFWS on 3 October 2007 (Appendix B). The Plan discusses 9 RCW clusters impacted by Transformation/ BRAC projects and the general protocols for translocation efforts that will be required. Specific translocation plans for each cluster will be developed as the project/ action approaches. The September 2007 Translocation Plan includes details for translocation of RCWs from Clusters O09-04 and O09-05 to recruitment clusters located on Fort Benning (Fort Benning 2007a).

Table 2-6. Fiscal years 2007-2013 Transformation projects on Fort Benning. Status as of 13 October 2008.

Program Type-Transformation	Project Number	Project Title	Fiscal Year-Transformation (Funded Date)	Fiscal Year-Current (Funded Date)	Location- Transformation	Location- Current/ MCOE	*Status
BRAC	64370/ *65040*	Trainee Barracks Complex 1 and Borrow Areas	2007	2007	Harmony Church	Harmony Church	Timber harvest complete; construction underway
BRAC	64459/ *65862*	Training Support Brigade Complex (Phase 1 and 2)	2007-2008	May 2008	Harmony Church	Harmony Church	Timber harvest complete; construction underway
BRAC	65056	Brigade Headquarters Complex	2007	2007	Harmony Church and Kelley Hill	Harmony Church	Timber harvest complete; construction underway
BRAC	54931	Child Development Center 6-10 Years	2007	2007	Main Post	Main Post	Construction underway
BRAC	65382	Tank/ Fighting Vehicle Stationary Gunnery Range 1	2007	October 2008	Northern ranges	Oscar Area	Final Design Stage
BRAC	65032	Fire and Movement Range 1	2007	October 2008	Northern ranges - Oscar Complex	Oscar Complex	Design Complete
BRAC	65044	Modified Record Fire Range 2	2007	October 2008	Northern ranges - Oscar Complex	Oscar Complex	Design Complete
BRAC	65068	Trainee Barracks Complex 2	2007	2007	Sand Hill	Sand Hill	Timber harvest complete; construction underway
BRAC	64080	Troop Medical Clinic	2008	October 2008	Harmony Church	Harmony Church	Final Planning Stages
BRAC	65041	Trainee Barracks Complex 3	2008	August 2008	Harmony Church	Harmony Church	Final Design Stage
BRAC	65251	Vehicle Maintenance Facility	2008	September 2008	Harmony Church	Harmony Church	Final Design Stage
BRAC	65253	16th CAV Regt HQ Building Complex (BDE, BN, COs)	2008	2009	Harmony Church	Harmony Church	Final Design Stage
BRAC	67648	Maneuver Center Simulation Facility	2008	November 2008	Harmony Church	Sand Hill/Harmony Church	Final Design Stage
BRAC	65285	Maneuver Center Renovations, Building 4	2008-2010	2008	Main Post	Main Post	Construction 2009
Other	65394	SOF Special Troops Battalion HQ Bldg	2008	2008	Main Post (2800/ 2900 Block)	Main Post (2800/ 2900 Block)	Construction 2008
Other	65396	SOF Ranger HQ Addition	2008	2008	Main Post (2800/ 2900 Block)	Main Post (2800/ 2900 Block)	Construction 2008
Other	65397	SOF Vehicle Maintenance Shop	2008	2008	Main Post (2800/ 2900 Block)	Main Post (2800/ 2900 Block)	Construction 2008
Non-BRAC	65035	Rifle/ Machine Gun Zero Range 1	2008	2009	Northern ranges - Oscar Complex	Northern ranges - Oscar Complex	MCOE Biological Assessment
Non-BRAC	65036	Rifle/ Machine Gun Zero Range 2	2008	2009	Northern ranges - Oscar Complex	Northern ranges - Oscar Complex	MCOE Biological Assessment
Non-BRAC	65038	Rifle/ Machine Gun Zero Range 4	2008	November 2009	Northern ranges - Oscar Complex	Oscar Complex	Final Design Stage
Other	65045	Modified Record Fire Range 3	2008	December 2008	Northern ranges - Oscar Complex	Oscar Complex	Design complete
BRAC	65046	Modified Record Fire Range 4	2008	December 2008	Northern ranges - Oscar Complex	Oscar Complex	Design complete
BRAC	65048	Modified Record Fire Range 6	2008	December 2008	Northern ranges - Oscar Complex	Oscar Complex	Design complete
BRAC	62956	Health Clinic Expansion - Winder	2008	October 2008	Sand Hill	Sand Hill	Final Design Stage
BRAC	64368	Solomon Dental Clinic Expansion	2008	2008	Sand Hill	Sand Hill	Construction 2009
BRAC	64462/ 51256/ 67419	Reception Station Barracks and Processing Center (Phases 1, 2 and 3)	2008-2010	2009-2009	Sand Hill	Sand Hill	Intermediate Design Stage
BRAC	65287	Training Aids Center Building Conversions	2008	September 2009	Sand Hill	Sand Hill	Intermediate Design Stage
BRAC	65322/ 67458/ 67529/ 65118/ 65283/ 65288	General Instruction Building Complex Student Dining Facility, Main Post Cuartels Conversion of Non-UPH Billeting Space to Transient UPH AST Infantry Officer Basic Course Headquarters Complex Building Conversions	2008-2010	2009-2010	Installation Wide	Installation Wide	Initial Design Stage Construction 2009 Construction 2009 Construction 2009
BRAC	65439/ 64461/ 65337/ 65062/ 65056/ 65440/ 65552	Infrastructure Support, Phase 1 (includes Fire Station, Ammunition Supply Point, AT/ FP Access Control Point, Marne Rd./ Lindsay Crk. Pkwy. Intersection Improvements and Relocation of Material Recycling Facility)	2008	2008-2009	Harmony Church Kelley Hill Main Post Sand Hill Infrastructure Total	Harmony Church Kelley Hill Main Post Sand Hill Infrastructure Total	Planning Stages Construction 2008-2009 Timber harvest complete Construction 2008-2009 Construction 2008-2009
BRAC	65252/ 48644	Centralized Wash Facility with Soaking Capability	2009	April 2009	Harmony Church	Harmony Church	Initial Planning Stages
BRAC	65286	Armor Officer Basic Course HQ Complex (includes Utility Corridor)	2009	2009	Southern ranges- Good Hope	Southern ranges- Good Hope	Initial Planning Stages
BRAC	65438	Vehicle Maintenance Instruction Facility	2009	2009	Harmony Church	Harmony Church	Initial Planning Stages
BRAC	65440	AT/FP Access Control Point	2008	2008	Harmony Church	Harmony Church	Construction 2008
BRAC	65552	Marne Rd/Lindsay Crk Pkwy Intersection Improvements	2008	2008	Kelley Hill	Kelley Hill	Construction 2008
Non-BRAC	65061	Museum Operations Support Buildings	2009	2010	Harmony Church and Main Post	Harmony Church and Main Post	Construction 2010
BRAC	65080	Consolidated Troop Medical Clinic	2009	2009	Main Post	Main Post	Construction 2009
BRAC	70235/ 65081/ 67461	Hospital Replacement	2009-2010	**2008	Main Post	Main Post	MCOE Biological Assessment
Non-BRAC	65578	CIDC Group/ BDE Headquarters Building	2009	2009	Main Post	Main Post	Construction 2009

Project reanalyzed in MCOE Biological Assessment

Project cancelled

blue Updated information on Transformation project

* Project status information provided by K. Witter, Fort Benning Conservation Branch

** Project funding awarded in FY 2008, however, construction will not begin until FY 2009.

Table 2-6 (cont'd.). Fiscal years 2007-2013 Transformation projects on Fort Benning. Status as of 13 October 2008.

Program Type- Transformation	Project Number	Project Title	Fiscal Year- Transformation (Start Date)	Fiscal Year- Current (Start Date)	Location- Transformation	Location- Current/ MCOE	*Status
Other	62207	Combined Arms Collective Training Facility, Phase II	2009	2010	Northern ranges	Northern ranges	
BRAC	64797	Drivers Training Course	2009	2009	Harmony Church	Harmony Church	MCOE Biological Assessment
BRAC	72017	Vehicle Recovery Area	2009	2009	Harmony Church	Harmony Church	MCOE Biological Assessment
Other	65037	Rifle/ Machine Gun Zero Range 3	2009	November 2009	Northern ranges- Oscar Complex	Oscar Complex	Initial Design Stage
Other	65039	Rifle/ Machine Gun Zero Range 5	2009	2009	Northern ranges - Oscar Complex	Northern ranges - Oscar Complex	MCOE Biological Assessment
BRAC	65047	Modified Record Fire Range 5	2009	June 2009	Northern ranges - Oscar Complex	Oscar Complex	60 % Design
BRAC	65383	Tank/ Fighting Vehicle Stationary Gunnery Range 2	2009	2009	Northern ranges - Ware ranges	Northern ranges - Ware Range	MCOE Biological Assessment
Non-BRAC	69743	Maneuver Corridor- South	2009	2009	Southern ranges	Southern ranges	MCOE Biological Assessment
BRAC	69668	Good Hope Maneuver Area	2009	2009	Southern ranges- Good Hope	Southern ranges- Good Hope	MCOE Biological Assessment
BRAC	64491	Army Reserve Center/ OMS/ Unheated Storage	2010	2010	Harmony Church	Harmony Church	Construction 2008
BRAC	65405	Equipment Concentration Site	2010	2010	Harmony Church	Harmony Church	Construction 2008
BRAC	65284	Maneuver Center Headquarters Building Expansion and CDI Facility	2010	2010	Main Post	Main Post	Construction 2008
BRAC	65034	Fire and Movement Range 3	2010	2010	Northern ranges - Oscar Complex	Northern ranges - Oscar Complex	MCOE Biological Assessment
BRAC	65079	Automated Combat Pistol/ Military Police Firearm Qualification Complex	2010	N/A	Southern ranges- Coursen East Range	Southern ranges- Martin Range	MCOE Biological Assessment, Alt. B only
BRAC	65554	Construct Installation-wide Roads, Paved	2009	2009	Installation Wide	Installation Wide	MCOE Biological Assessment
BRAC	65557	Repair Existing Training Area Roads~~, Paved~~	2010	2010	Installation Wide	Installation Wide	MCOE Biological Assessment
BRAC	65246	Recreation Center	2011	2012	Harmony Church	Harmony Church, Sand Hill	MCOE Biological Assessment
BRAC	65248	Physical Fitness Center with Pool	2011	2012	Harmony Church	Harmony Church	MCOE Biological Assessment
Other	38134	Barracks Complex	2011	2011	Harmony Church and Main Post	Harmony Church and Main Post	Construction 2011
AMF	63799	3rd ID BCT (Heavy) Complex	2011	2011	Harmony Church	Harmony Church	Planning Stages
Other	65395	SOF Ranger Support Company HQ	2011	2011	Main Post (2800/2900 Block)	Main Post (2800/2900 Block)	Construction 2011
AMF	64548/ 67012	Qualification Training Range (QTR)	2011	N/A	Southern ranges	N/A	Project cancelled, replaced with MPMG in the proposed action.
BRAC (was AMF)	65070	Multi-purpose Machine Gun Range 2	2011	2011	Northern ranges- Ruth Range	Southern ranges	MCOE Biological Assessment
Other	62953	Rail Car Storage Trackage for Deployment	2012	2012	Harmony Church	Harmony Church	MCOE Biological Assessment
BRAC	64460	Direct Support/ General Support Vehicle Maintenance Facility	2012	March 2009	Harmony Church and Kelley Hill	Harmony Church	Planning Stages
BRAC	64790	Battle Command Training Center	2012	2012	Harmony Church	Harmony Church	Construction 2012
BRAC	65065	Chapel	2012	2012	Harmony Church	Harmony Church	Construction 2013
Other	62952	Headquarters Complex, 14th Combat Support Hospital	2012	2013	Main Post	Main Post	Construction 2013
BRAC	65249	Chapel	2013	2013	Sand Hill	Sand Hill	Construction 2013
BRAC	~~65580/ 46676~~ 70138	Child Development Center (under 6 years)	2013	2008	Main Post (Custer Road)	Main Post (Custer Road)	Initial Design Stage

Project reanalyzed in MCOE Biological Assessment
Project cancelled

blue Updated information on Transformation project
* Project status information provided by K. Witter, Fort Benning Conservation Branch
** Project funding awarded in FY 2008, however, construction will not begin until FY 2009.

RCW Demographic Monitoring Plan (Monitoring Plan): This plan was submitted to the USFWS on 21 March 2008 and a letter of concurrence was rendered on 9 May 2008 (Appendix C). The Monitoring Plan discusses procedures designed to detect, assess and react to impacts of Transformation actions on RCWs at Fort Benning. This includes monitoring all clusters directly impacted, clusters not directly impacted, but having cavity trees within 0.5 mile of projects removing habitat, and all clusters with cavity trees within 200 feet (ft.) of any road projects (Fort Benning 2008b). According to this plan, Fort Benning will monitor all clusters with cavity trees within 0.5 mile of maneuver area impacts (K. Witter, Fort Benning, pers. comm.). The Plan also discusses the dynamic nature of RCW cavity tree and cluster activity and the need to accommodate activity changes by revising the Monitoring Plan as needed, in order to annually monitor and color band 100 % of the impacted active RCW clusters.

Transformation/BRAC Access Plan (Access Plan): This plan was submitted to the USFWS on 2 April 2008 and was approved on 25 April 2008 (Appendix D). The Access Plan outlines the protocols for obtaining and scheduling access to ranges, training facilities and other areas for the purposes of training, forest management and endangered species monitoring. It is designed to facilitate and deconflict access among users resulting from Transformation actions and other ongoing mission actions (Fort Benning 2008c).

The Access Plan will be revised as necessary in order to ensure training can be conducted while simultaneously meeting all requirements of the Transformation BO (USFWS 2007a).

Quarterly reports: Three quarterly reports have been submitted to the USFWS (January, April and July 2008) (Fort Benning 2008d, 2008e and 2008i). These reports track the status of Transformation actions including, but not limited to, project clearing and construction, informal, project-specific consultation with USFWS, and implementation of RPMs and conservation measures from the BO.

Demographic monitoring: In accordance with the Monitoring Plan and based on project clearing and construction schedules, Fort Benning needed to monitor 56 clusters impacted by Transformation projects during the 2008 nesting season. Of these, 40 were already being monitored in order to meet other requirements; 16 clusters were monitored exclusively for Transformation monitoring requirements in 2008 (Fort Benning 2008i).

Habitat improvement: The Transformation BO required Fort Benning to improve potentially suitable habitat (explained in Section 5.4.4) within 10 clusters in order to avoid

Incidental Take by loss of foraging habitat (USFWS 2007a). Improvement of 59% of the required 2,259 acres has been completed to date, and all required improvements have been completed for Clusters HCC-03R, HCC-10R and SHC-02 (S. Hudson, Fort Benning, pers. comm.). All other required work will be completed prior to any timber clearing for the first project within the impacted clusters/ partitions and prior to December 2009 (Fort Benning 2008i).

Although Cluster SHC-02 was "taken" because of cluster isolation, and was therefore not on the list of 10 clusters requiring management, Fort Benning improved habitat in this cluster so it is not also "taken" by foraging habitat loss (Fort Benning 2008i; S. Hudson, Fort Benning, pers. comm.).

Cluster HCC-03R was "taken" due to loss of cavity trees in the Transformation BO (USFWS 2007a). In an effort to prevent the loss of this cluster, Fort Benning is attempting to shift the cluster away from Transformation construction by installing artificial cavities and improving potentially suitable habitat. Habitat improvements and cavity installation have been completed.

In addition to that required in the Transformation BO (USFWS 2007a), stand improvements are also being carried out to improve habitat in 40 other clusters impacted by Transformation. Approximately 62% of 4,911 acres have been improved to date (S. Hudson, Fort Benning, pers. comm.).

2.3.11. SUMMARY AND STATUS OF CURRENTLY APPROVED INCIDENTAL TAKES

The BO for the RCW ESMP evaluated Incidental Take for the loss of up to 5 active cavity trees per year due to military training or training-related wildfires, 41 RCW groups in the K15 and A20 Impact Areas due to explosive munitions or associated wildfires (not including 3 clusters deemed to be manageable) and 15 potential RCW groups associated with existing and future Supplemental Recruitment Clusters (SRCs) due to the lack of training restrictions in SRCs (USFWS 2002, DA 1996). SRCs and the treatment of clusters within dudded impact areas are discussed further in Section 6.8. Since the ESMP, no "takes" (measured as clusters abandoned due to harassment impacts or harm impacts due to damaged cavity trees or loss of foraging

habitat have been documented in the impact areas or SRCs, and no active cavity trees have been lost due to military training (M. Barron, Fort Benning, pers. comm.).

The Land Exchange BO provided an Incidental Take Statement for 1 RCW group on the land acquired by the City of Columbus (USFWS 1998). This cluster contained a PBG in 2008, although the majority of its foraging habitat was removed by winter 2005. As stated above, this "take" was compensated for by the creation of 4, and occupation of one, recruitment cluster on Fort Benning. As an additional minimization effort, Fort Benning also increased its installation RCW population goal from 350 to 351 PBGs. Compensation Clusters E08-04 and O14-03 were occupied in 1999 and 2000, respectively, and have been inhabited by PBGs for the last 5 years. Cluster O14-03 will have foraging habitat impacts associated with the proposed MCOE action, but E08-04 will not be impacted (see Section 6.8). The other 2 recruitment clusters, HCC-03 and O09-04, were included in the Transformation Incidental Take Statement due to cavity tree and foraging habitat impacts (USFWS 2007a). Cluster HCC-03 has been occupied by a PBG for the last 5 years and Cluster O09-04 was occupied by a PBG in 2006, 2007 and 2008 (see below for more information on O09-04).

The 2004 BO for the DMPRC provided Incidental Take for an additional 7 active clusters adjacent to the range due to loss of foraging habitat and potential harassment impacts (USFWS 2004) and that number was increased to 8 in 2006 (Fort Benning 2005, USFWS 2006c). Since the initial timber clearing, no clusters have been abandoned as a result of the action (additional details on these clusters can be found in Section 6.8). As part of the minimization effort, Fort Benning arranged to manage 11 clusters in the A20 impact area, resulting in a total of 14 managed clusters within the A20 impact area (USFWS 2004, Fort Benning 2005, USFWS 2006c).

The Transformation BO included an Incidental Take Statement for up to 32 active RCW clusters resulting from loss of cavity trees, loss of foraging habitat, harassment impacts, reduction of cluster density and/ or fragmentation (USFWS 2007a). Of the 32 RCW "takes," 2 have been carried out. Clusters O09-04 and O09-05 were to have all cavity trees removed for Stationary Tank Range 1 (PN 65382) in 2008, therefore, the adult RCWs were translocated from both clusters to recruitment Clusters G05-04 and F04-05, respectively, in 2007 (Fort Benning 2008d). All RCW cavities in these 2 Oscar clusters were screened to prevent RCWs from reoccupying the cluster. During the nesting season of 2008, these 4 birds were not detected in

the recipient cluster, however, both recipient clusters were active. The female translocated from O09-05 to F04-05 was the breeding female in nearby Cluster F04-02, which was previously inactive (M. Barron, Fort Benning, pers. comm.). One RCW, an adult male translocated from Cluster O09-04, returned to his home cluster (approximately 11 miles away) by May 2008 and was observed working on a start cavity (M. Barron, Fort Benning, pers. comm.) (see Section 6.8.1 for information on RCW biology, including cavity stages of completion). As of August 2008, Fort Benning Conservation Branch (FBCB) had unscreened 2 cavities at O09-04 and a female RCW was also roosting at the site (T. Marston, Fort Benning, pers. comm.).

Three cavity trees (1 active cavity, 1 active start and 1 inactive start) were cut in Cluster HCC-10R for construction of the Trainee Barracks Complex 1 (PN 64370) in Harmony Church. This was an increased impact from that evaluated in the BO, however, USFWS approved the change via informal consultation provided FBCB install 2 artificial cavities in order to shift the cluster away from construction. FBCB installed 2 artificial cavities in January 2008, thereby avoiding a potential "take" (Fort Benning 2008d).

The Transformation BO also acknowledged impacts to 1 relict trillium population, Randall Creek North, resulting from clearing, construction and operation of a proposed road (PN 65554) and 2 small-arms ranges (Modified Record Firing (MRF) Range 6, PN 65048 and Rifle/ Machine Gun Zero (Z) Range 4, PN 65038). Affected plants would be relocated to a protected area on the Installation or a protected off-Post site (USFWS 2007a). The location of the proposed road has changed substantially since the BO and is being reanalyzed as part of the MCOE proposed actions. Range Z4 has shifted to the east and will no longer impact relict trillium. Range MRF 6 (PN 65048) is currently in final planning stages (Table 2-6). At the time of submittal of the Transformation Biological Assessment, the construction limits of the range were not expected to impact the relict trillium population; all projected range impacts were to be from ordnance once the range was operational. During design, however, construction limits were expanded slightly to allow for drainage and had the potential to impact 3 plants. The expansion of the range will require clearing habitat within the 200-foot buffer of the population, which may also lead to adverse impacts from the resulting changes in the surrounding habitat (R. Thornton, Fort Benning, pers. comm.). Fort Benning informally consulted with USFWS for this change and transplanted 3 relict trillium plants from the Randall Creek North population to a site

just north of the Baker Creek population, also on Fort Benning, in the summer of 2008 while they were dormant (M. Elmore, The Nature Conservancy (TNC), pers. comm.).

3. ENVIRONMENTAL BASELINE

This section describes general existing conditions within the Action Area, including ongoing and approved actions. In order to minimize repetition, the pre-project conditions of specific project sites are presented in Section 4 and the pre-project conditions and statuses of Federally-listed species within the Action Area are included with the impact analyses in Section 6.

The Endangered Species Consultation Handbook (USFWS and NMFS 1998) states that "when determining an Action Area it must include the project area and all the areas surrounding the activity up to where the effects will no longer be felt by the listed species." The RCW Action Area includes all areas on Fort Benning and areas outside of the Installation, but within the RCW "neighborhood" and/ or within the RCW survey area for the proposed action. This area encompasses the area that would be considered the relict trillium Action Area (Figures 3-1 and 3-2).

Proposed MCOE actions have the potential to affect RCWs on the entire Installation, for reasons including, but not limited to, displacement of current training, habitat fragmentation and an increased need for intra-population RCW translocation.

Because there have been minor changes to project impacts since the Transformation BO (USFWS 2007a) that have been, or are likely to be, approved via the Installation's NEPA process and, if necessary, informal consultation with USFWS, the post-project conditions presented in the Transformation Biological Assessment and BO no longer represent a true "starting point" for analyses for the proposed action. Instead, the "post-Transformation" conditions described in this document demonstrate how projects could continue to be carried out under the Transformation BO without reanalysis and/or reinitiation of formal consultation on the 16 projects that have changed substantially.

The configuration of projects and training areas post-Transformation includes the current limits of disturbance for the Transformation projects that are not being reanalyzed, along with the original limits of disturbance approved in the BO for the 16 Transformation projects being reanalyzed in the proposed action (Figure 3-3) (instead of using the updated location, the 16 reanalyzed Transformation projects are depicted at their previously evaluated location.)

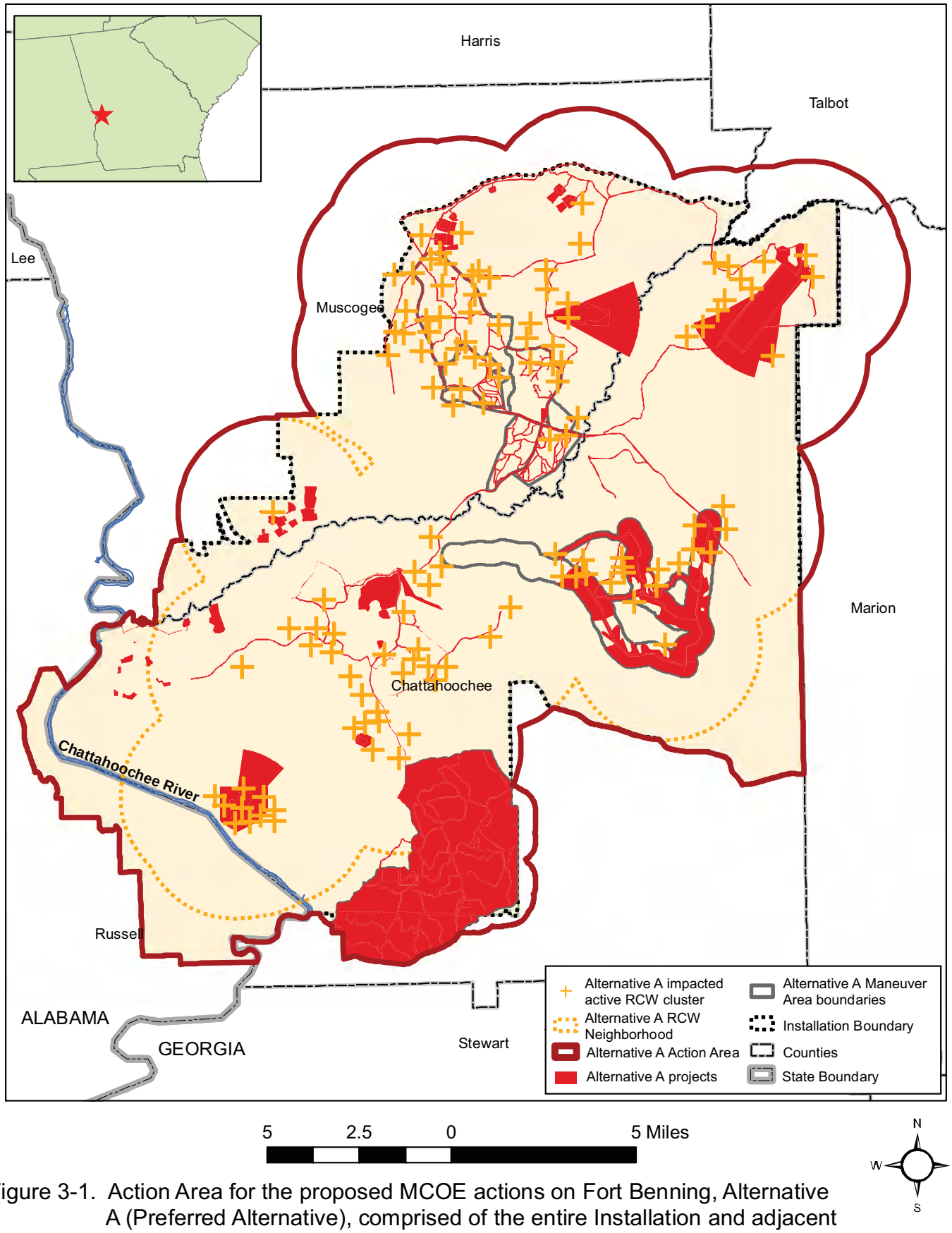


Figure 3-1. Action Area for the proposed MCOE actions on Fort Benning, Alternative A (Preferred Alternative), comprised of the entire Installation and adjacent lands within the RCW "neighborhood."

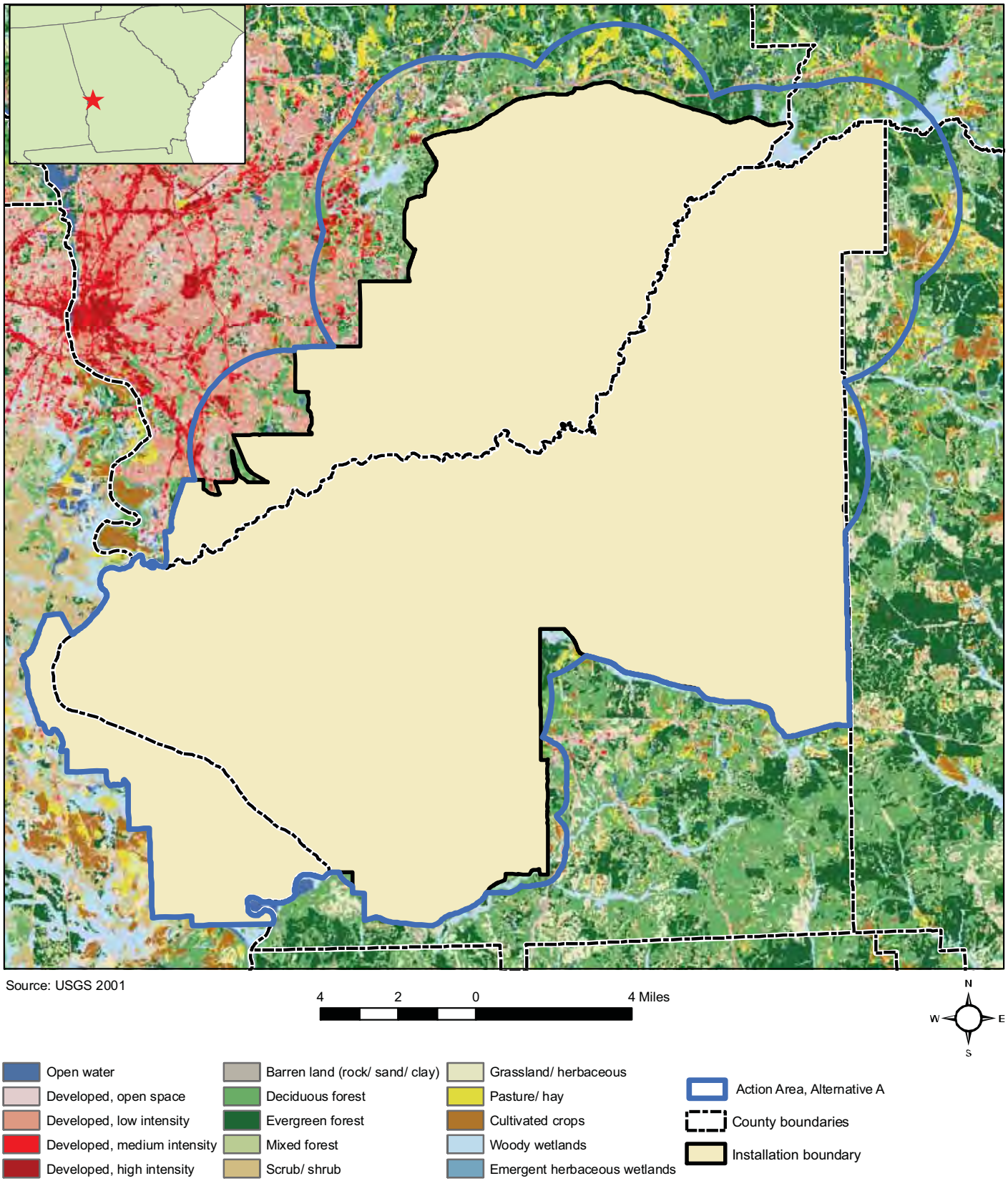


Figure 3-2. Land uses adjacent to Fort Benning and within the Action Area for the proposed action on Fort Benning, Alternative A (Preferred Alternative).

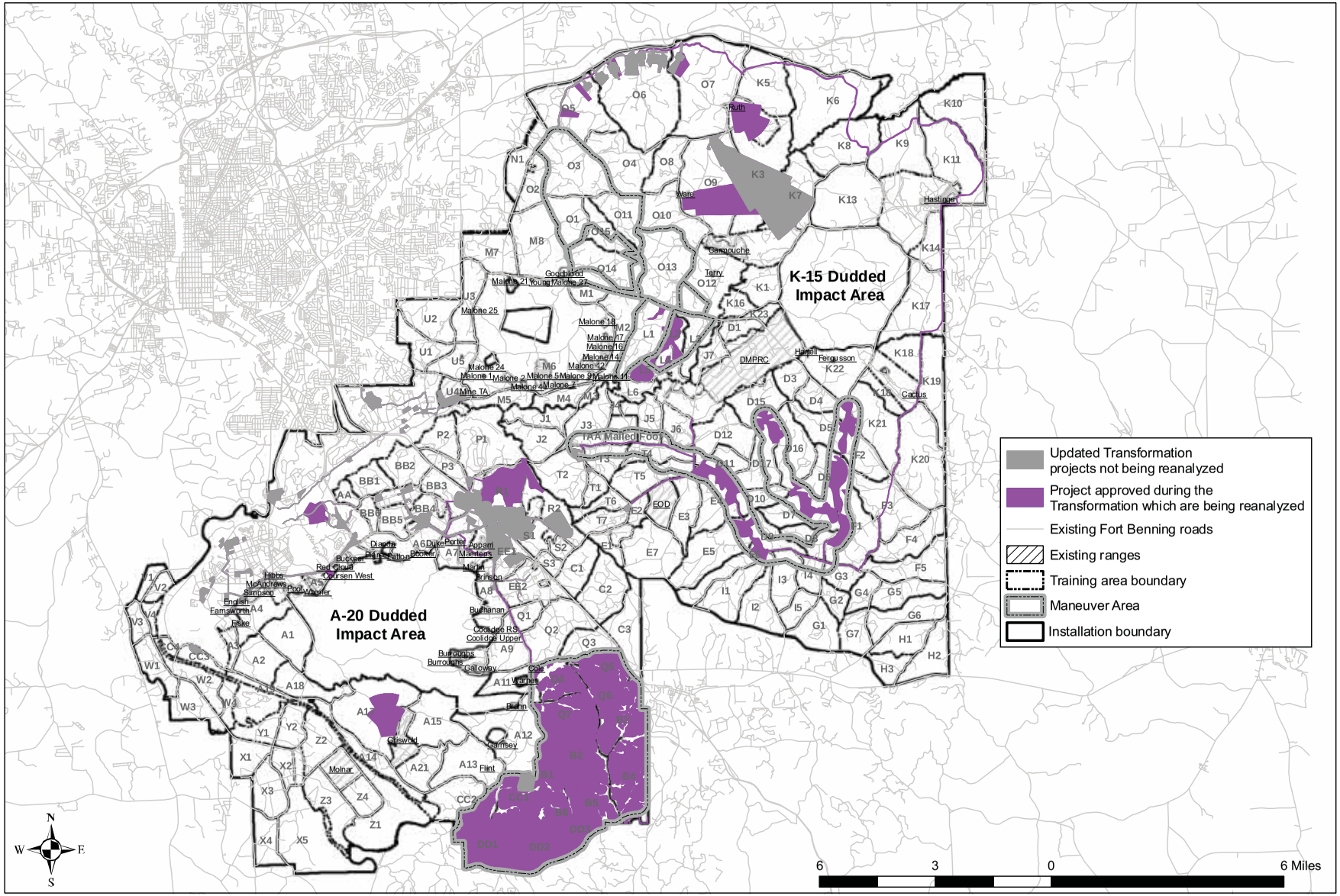


Figure 3-3. The No Action Alternative ("Post-Transformation conditions"), comprised of the current limits of disturbance of Transformation projects **not** requiring reanalysis in the proposed MCOE action and the original limits of disturbance evaluated in the Transformation Biological Opinion for projects **requiring** reanalysis.

Likewise, post-Transformation personnel numbers reflect those evaluated in the Transformation BO (USFWS 2007a); any additional increases associated with MCOE are part of the proposed action.

3.1. NATURAL ENVIRONMENT

3.1.1. Topography/ Geology

Most of Fort Benning is located south of the Piedmont Province, however small inclusions of Piedmont geology, soils and vegetation occur in the northern portions of the Installation. Fort Benning is located where Coastal Plain strata overlap Piedmont rocks, a zone defined as the Fall Line. This is also the area where the Piedmont basement rocks are first exposed in streams flowing to the Atlantic Ocean and the Gulf of Mexico (Gulf South Research Corporation 1999).

Fort Benning's location relative to the Fall Line results in an overlapping diversity of Piedmont and Coastal Plain habitats and their associated plant and animal communities. This effect is not limited to terrestrial communities, but is also reflected in the physical features and biotic composition of the streams that pass through or arise within the Installation. The predominantly rolling terrain is highest in the east, rising approximately 740 ft. above mean sea level (MSL), and lowest in the southwest along the Chattahoochee River, approximately 190 ft. above MSL (Fort Benning 2001).

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 sediments form the uplands and consist of the 5 following geologic formations (descriptions are taken from Reinhardt et al. (1994)):

Kr - Ripley Formation (Upper Cretaceous): 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 the upper part of the unit. Thickness ranges from 133 to 250 ft. The Ripley Formation occurs only along the southeastern boundary of Fort Benning where the highest elevations on the Installation are found.

Kc - Cusseta Sand (Upper Cretaceous): 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. The Cusseta Sand Formation is located in the southeastern corner of Fort Benning.

Kb - Blufftown Formation (Upper Cretaceous): 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; thickness ranges from 200 to 433 ft. The Blufftown Formation is the dominant formation south of Upatoi Creek.

Ke - Eutaw Formation (Upper Cretaceous): Fine to very coarse sand, very pale orange to yellow, and clay, brownish -gray; thickness ranges from 100 to 280 ft. The Eutaw Formation is found adjacent to tributaries of Upatoi Creek in the center of the Installation.

Kt - Tuscaloosa Formation (Upper Cretaceous): 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 are difficult to distinguish from residuum on underlying crystalline rocks; thickness ranges from 165 to 500 ft. The Tuscaloosa Formation is the dominant formation on uplands north of Upatoi Creek.

3.1.2. SOILS

There are 2 basic soil provinces on Fort Benning: the Georgia Sand Hills and the Southern Coastal Plain. The GA Sand Hills are a narrow belt of deep sandy soils with rolling to hilly topography. These soils are primarily derived from marine sands, loams and clays that were deposited over acid crystalline and metamorphic rocks. South of the Sand Hills are Southern Coastal Plain soils, which are divided into nearly level to rolling hills and gently sloping to steep uplands. Southern Coastal Plain soils in this area have a loamy or sandy surface layer and loamy or clayey subsoil (Cooperative Extension Service 1993) (Figure 3-4).

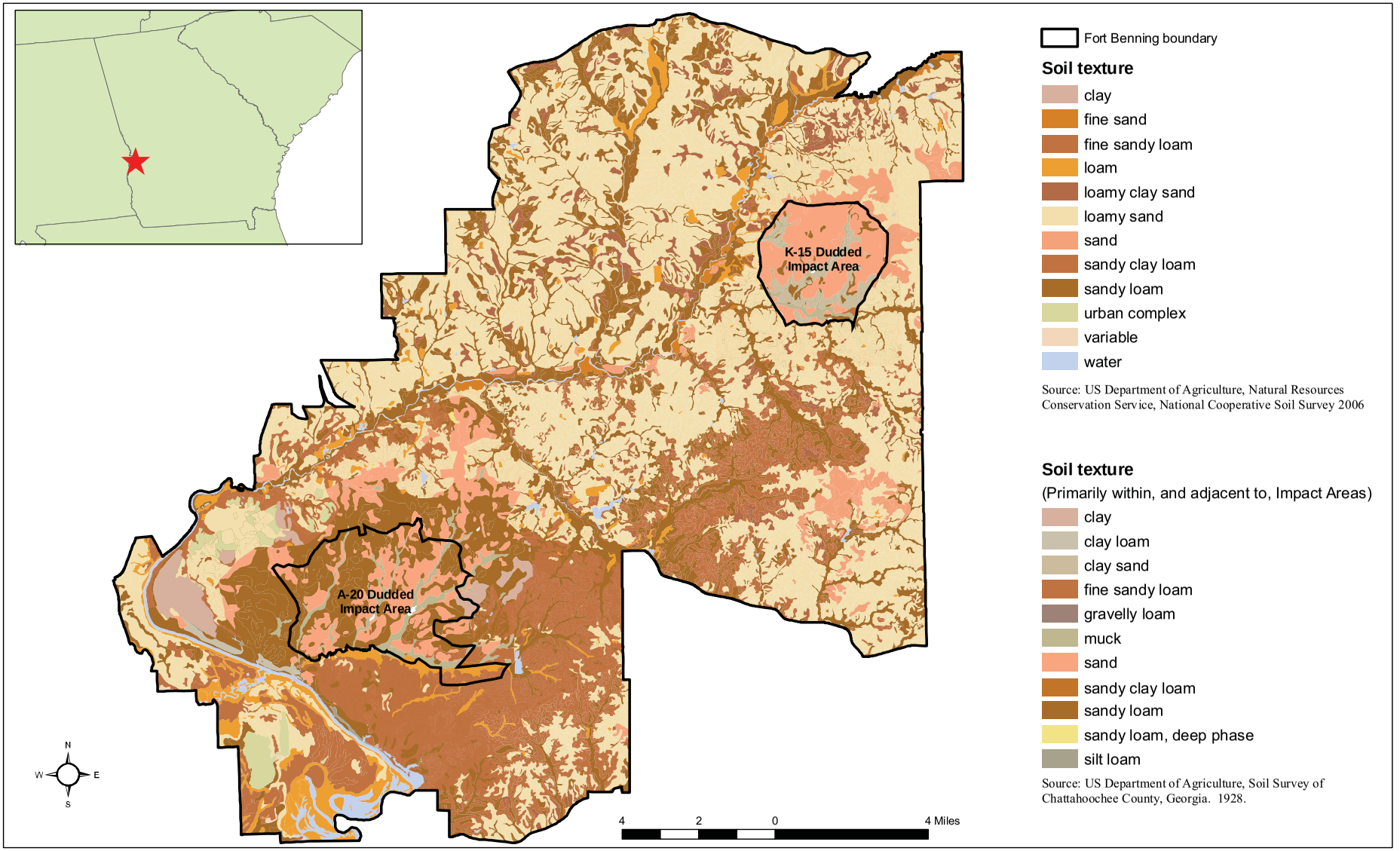


Figure 3-4. Soil texture map for Fort Benning.

A soil texture map for Fort Benning is shown in Figure 3-4. Mapping units represent the relative proportions of sand, silt and clay in a soil. The dudded areas of the A20 and K15 impact areas are not mapped in the modern method of soil surveying because of restricted access, however, data from a 1928 soil survey (United States Department of Agriculture (USDA) 1928) was used to fill these gaps (Figure 3-4). Based on the available soil survey data, the majority of Fort Benning's soils are identified as highly erodible. The degree of erodibility is determined by factors such as drainage, permeability, texture, structure and percent slope.

The majority of the lands comprising Fort Benning had been clearcut and farmed prior to its acquisition from 1918-1942. When acquired, almost all areas were eroded, with patches of forest remaining in areas not suitable for farming. One of the measures taken beginning in the 1930s to rehabilitate the land was the planting of fast-growing loblolly pine across the landscape (Ecological Society of America and Strategic Environmental Research and Development Program (SERDP)'s Ecosystem Management Project (SEMP) 2008).

3.1.3. SURFACE WATERS

Most streams found within Fort Benning drain into the Chattahoochee River through Upatoi Creek on the GA side and Uchee Creek on the AL side. The southernmost portion of Fort Benning drains directly into the Chattahoochee River and the northwestern portion of the Installation drains into Bull Creek. A very small area in the southeastern corner drains into the Flint River Basin to the east (Fort Benning 2001). The streams at Fort Benning are either Piedmont or Coastal Plain in origin. Piedmont streams generally flow in a southerly direction. Major Piedmont streams include Baker, Cox, Dozier, Kendall, Randall, and Upatoi Creeks, as well as the Chattahoochee River.

Coastal Plain streams generally flow from east to west on the GA side and west to east on the AL side. Ochillee, Pine Knot, Little Pine Knot, Sally Branch and Bonham Creeks are the major Coastal Plain streams on Fort Benning. Oswichee Creek has intermediate characteristics between a Piedmont and Coastal Plain stream (Fort Benning 2001).

The largest waterway on Fort Benning is the Chattahoochee River, which is a major river that flows through approximately 15 miles of the Installation, separating it into its AL and Georgia portions. Several dams have been built on the Chattahoochee River upstream and downstream of Fort Benning to regulate river flow and produce electricity. The northern portion

of Lake Walter F. George extends into the southwestern portion of the Installation. Numerous oxbows, old meander channels, isolated ponds and wetland areas are found along the Chattahoochee River (Fort Benning 2001).

There are 14 man-made ponds that range in size from 1 to 72 acres on Fort Benning. Numerous natural ponds created by beavers (*Castor canadensis*) are also present.

3.1.4. ECOLOGICAL COMMUNITIES

The vegetation of Fort Benning can be classified into over 70 vegetation alliances. An alliance is a group of plant associations that share 1 or more diagnostic species, which, as a rule, occur in the uppermost strata of the vegetation. TNC has delineated these vegetation alliances across the entire Installation based on a subset of the National Vegetation Classification System (NVCS) tailored to Fort Benning's vegetation (Association for Biodiversity Information 2001). The alliance map was created by interpretation of 1999 color imagery and depicts alliances over the entire Installation. A final accuracy assessment for the map identified an overall, or "map user," accuracy of 83% (Pyne et al. 2001).

In addition to vegetation alliances, TNC has delineated finer-scale plant associations on selected portions of the Installation (Unique Ecological Areas (UEA) and other areas where associations of conservation concern were known to exist). A plant association is a plant community with a definite (recognizable and somewhat repeatable) floristic composition, which occurs within uniform habitat conditions and possesses uniform physiognomy. Associations are ranked by their relative imperilment to determine their relative conservation priority.

These associations and alliances may be combined and categorized in a variety of ways, depending on one's analytical or assessment objective. A much-generalized depiction of the vegetation alliances (Figure 3-5) groups the alliances into 6 broad categories (W. Harrison, unpub. data.) based on the overstory tree species composition, plus categories for open water and urban/ military use. This map is perhaps the most useful coarse-scale illustration of the NVCS delineation of Fort Benning. It reflects 1999 overstory vegetation across the Installation (including dudded impact areas) and includes boundaries of ecological communities regardless of training compartments, stands or other administrative or management-related delineations. The map legend of Figure 3-5 is intended to illustrate the effects of fire history and hydrology on the vegetation. Vegetation alliances dominated by longleaf pine (*Pinus palustris*) and scrub oaks

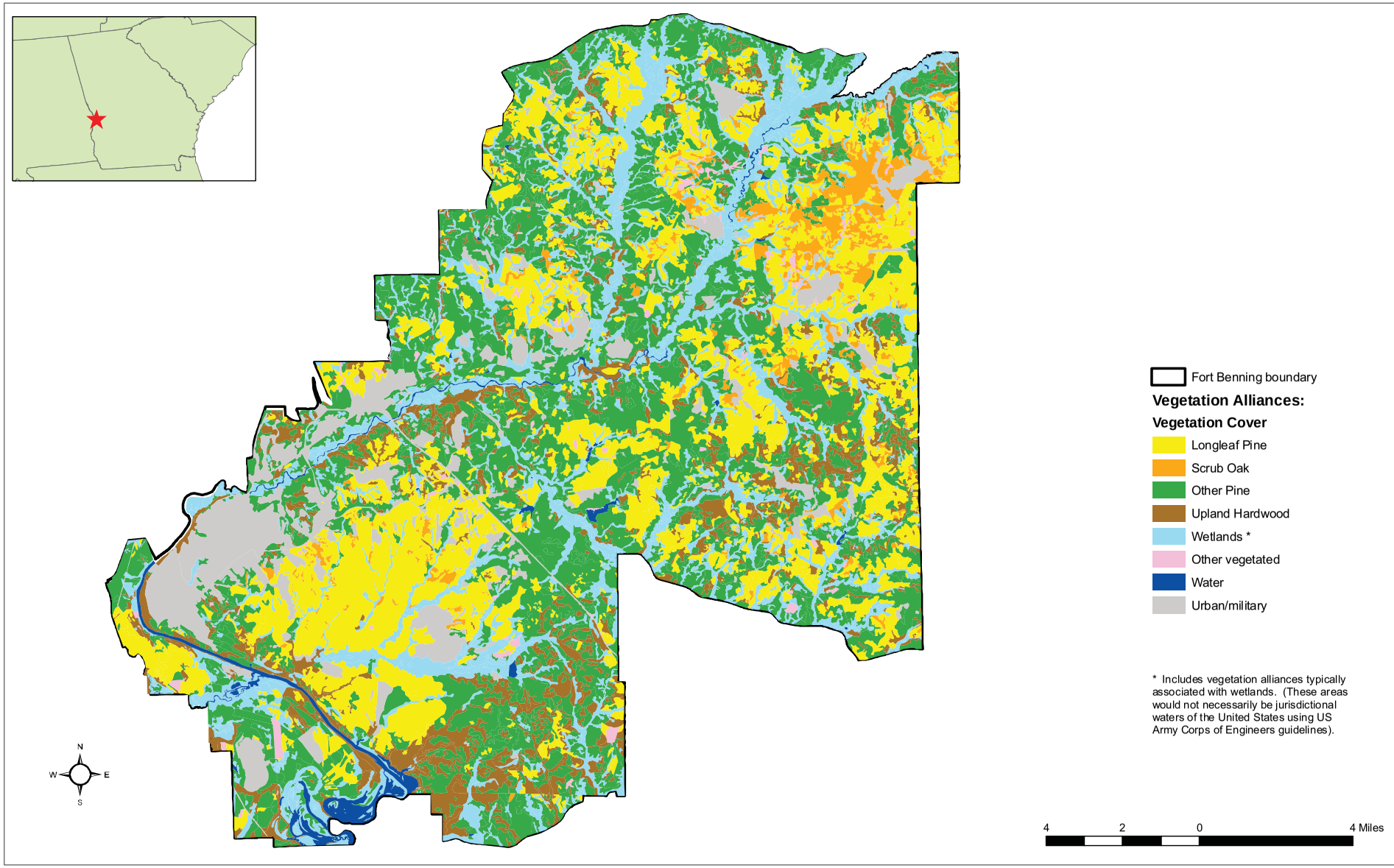


Figure 3-5. Categories of vegetation alliances (National Vegetation Classification System) found on Fort Benning, 1999. Mapped by The Nature Conservancy.

(*Quercus sp*.) have likely received the highest fire frequency, followed by alliances dominated by "other pine," and then those dominated by upland hardwoods. Vegetation alliances associated with wetlands, combined here into 1 category, have received very infrequent fire.

The vegetation can also be divided based on the ecological groups, which are groups of plant associations that tend to be found in similar environments and are influenced by similar ecological processes. The ecological groups are based more on the *natural* community type of an area than the current conditions (e.g., areas which are currently classified as "Pinus palustris woodland," "Pinus taeda forest" or "Quercus laevis woodland" alliances are all included in the "Longleaf pine sandhills" ecological group). Broad descriptions of ecological groups are listed below and are shown in Figure 3-6 (descriptions were taken from the INRMP (Fort Benning 2001) and the International Classification of Ecological Communities (ICEC)).

3.1.4.1. Dry-Mesic Hardwood and Dry-Mesic Hardwood/Pine Forest

These forests are quite variable on the Installation and occur in the ecotones between dry ridge tops and mesic bottoms. Common overstory species include white oak (*Quercus alba*), water oak (*Q. nigra*), southern red oak (*Q. falcata*), post oak (*Q. stellata*), sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), shortleaf pine (*P. echinata*), tulip poplar (*Liriodendron tulipifera*) and pignut hickory (*Carya glabra*). Sourwood (*Oxydendrum arboreum*), sparkleberry (*Vaccinium arboreum*), red maple (*Acer rubrum*), flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), sassafras (*Sassafras albidum*), redbud (*Cercis canadensis*) and ironwood (*Carpinus caroliniana*) are common understory species. Common shrubs include deerberry (*Vaccinium stamineum*) and littlehip-haw (*Crataegus spathulata*). Woody vines include greenbriers (*Smilax* spp.), muscadine grape (*Vitis rotundifolia*), crossvine (*Bignonia capreolata*) and yellow jessamine (*Gelsemium sempervirens*) and herbaceous species include arrowleaf heartleaf (*Hexastylis arifolia*), partridge berry (*Mitchella repens*) and several grasses.

3.1.4.2. Gum / Oak ponds

Gum / oak ponds are usually small and isolated and are mostly found in uplands where small depressions hold water for long periods of time. They are not filled by running water or

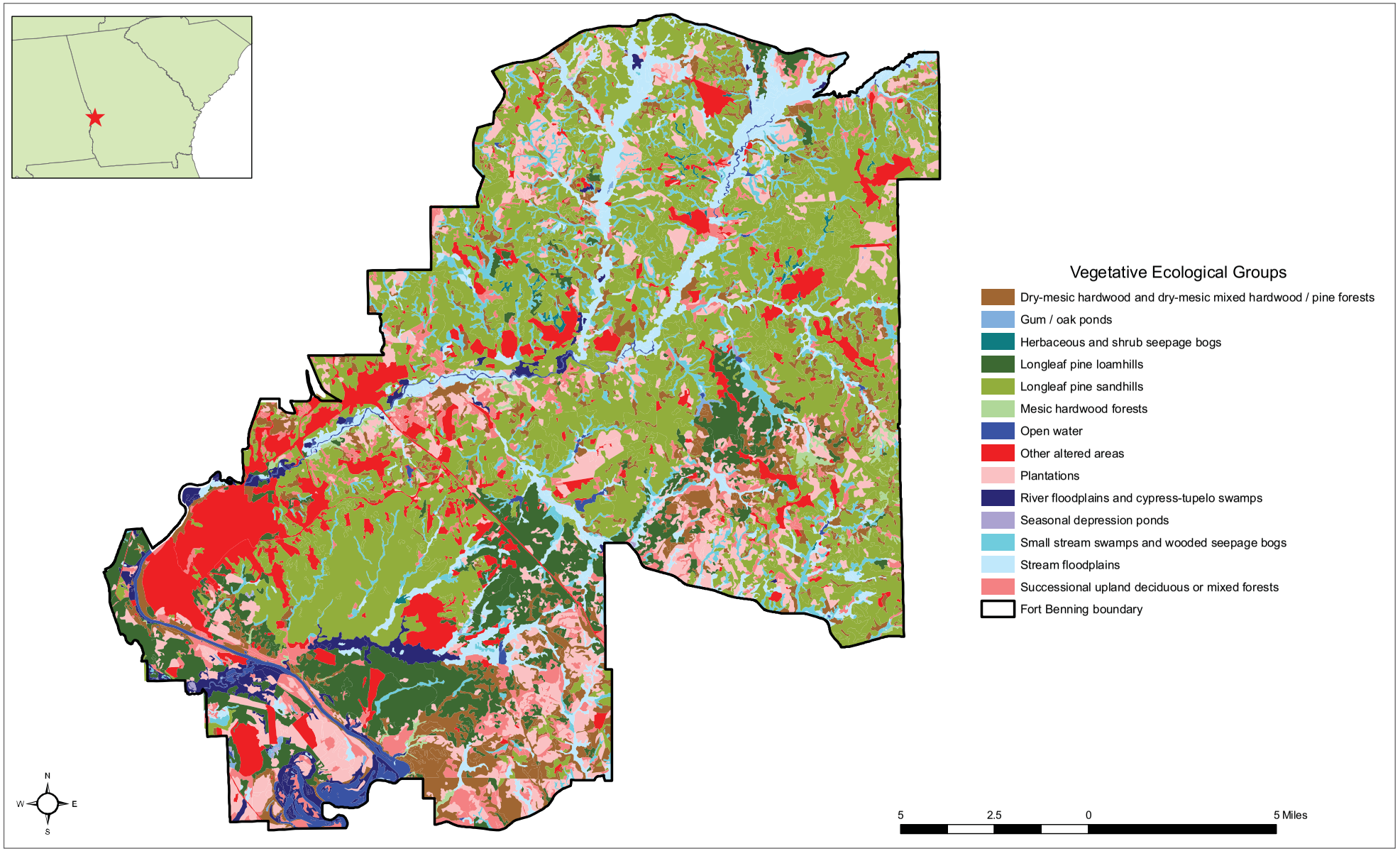


Figure 3-6. Vegetative ecological groups located on Fort Benning. Mapped by The Nature Conservancy.

seepage; instead, they hold rainwater and the water levels change with the season. Dominant overstory species can be sweetgum, swamp blackgum (*Nyssa biflora*), water tupelo (*N. aquatica*), willow oak (*Q. phellos*), laurel oak (*Q. laurifolia*) or water oak. The shrub layer is variable depending on an individual pond's water depth, but American holly, sweet-pepperbush (*Clethra alnifolia*), dog-hobble (*Leucothoe axillaris*), buttonbush (*Cephalanthus occidentalis*) and wax myrtle (*Myrica cerifera*) are common. Sedges and ferns are the most common herbaceous species in some ponds; mosses and orchids may also be present.

3.1.4.3. Herbaceous and Shrub Seepage Bogs

The switch cane (*Arundinaria gigantea* ssp. *tecta*) and pitcher plant bogs within the Malone small arms range complex (Training Compartment M6) are the best example of this ecological group on Fort Benning. Fire is a necessary component for maintaining these bog systems and these areas burn frequently. A smaller, lower quality bog is located in Training Compartment O14, but woody species have invaded the site due to infrequent fire. Woody species common to these bogs include inkberry (*Ilex glabra*), sweet gallberry (*I. coriacea*), wax myrtle, and greenbriers. Herbaceous species include switch cane, sweet pitcherplant (*Sarracenia rubra*), sphagnum mosses (*Sphagnum* spp.), fringed orchids (*Platanthera* spp.), meadowbeauties (*Rhexia* spp.) and ferns.

3.1.4.4. Longleaf Pine Loamhills

Areas with loamy soils support some of the best remaining longleaf pine stands on the Installation. Longleaf pine is often mixed with loblolly and shortleaf pines. These stands naturally experienced frequent low intensity surface fires. Today the fire-return interval for some stands is more frequent, in part because of the many ordnance-induced wildfires. Common understory species include post oak, blackjack oak (*Q. marilandica*) and flowering dogwood. Pine regeneration also is a common component of the understory. Shrubs include deerberry, inkberry, sparkleberry, wax myrtle and sassafras. Common herbaceous species typically include a variety of native legumes, native grasses, including little bluestem (*Schizachyrium scoparium*), bracken fern (*Pteridium aquilinum*), blazing stars (*Liatris* spp.), goldenrods (*Solidago* spp.) and asters (*Aster* spp.). Disturbed areas may contain broomsedge (*Andropogon virginicus*).

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 lobolly pine or shortleaf pine dominance (for communities currently dominated by longleaf pine, see Figure 3-5).

3.1.4.5. Longleaf Pine Sandhills

Pine stands in this habitat type are typically less dense than those in loamhill communities and are used for mechanized training which can damage plant and animal communities. Erosion is a major management concern in these areas. Because of the deep, dry, sandy soils, longleaf pine better maintains dominance over other pines. Scrub oaks that are a common understory component include bluejack (*Q. incana*), sand post (*Q. margarettiae*) and turkey oaks (*Q. laevis*). Sassafras, sparkleberry and hawthorns (*Crataegus* spp.) are common shrub species. Grasses, legumes, goldenrods and asters are common and diverse in the ground cover. The longleaf pine stands in these dry sandy areas support RCWs, gopher tortoises (*Gopherus polyphemus*) and dusky gopher frogs (*Rana capito sevosa*).

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 lobolly pine or shortleaf pine in these areas (for habitat currently dominated by longleaf pine, see Figure 3-5).

3.1.4.6. Mesic Hardwood Forests

Mesic hardwood forests (typically non-oak dominated) are often found in the bottoms of cool, shady, steep ravines. Beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), sweetgum, southern magnolia (*Magnolia grandiflora*), white oak and bitternut hickory (*C. cordiformis*) are common overstory species. Common understory species are flowering dogwood, ironwood, witch hazel (*Hamamelis virginiana*) and red bay (*Persea borbonia*). Shrub species include titi (*Cyrilla racemiflora*), mountain laurel (*Kalmia latifolia*) and fetterbush (*Lyonia lucida*). Common woody vines include muscadine grape, partridge berry, wild sarsaparilla (*Smilax pumila),* Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*). Indian cucumber-root (*Medeola virginiana*), cranefly orchid (*Tipularia discolor*), wide-leaf bunchflower (*Melanthium latifolium)*, croomia (*Croomia pauciflora*) and beech drops (*Epifagus virginiana*) are found in the herbaceous layer.

3.1.4.7. Open Water

This ecological group includes areas of open water such as lakes and ponds (natural or man-made), borrow pits, rivers and streams. Impounded water communities include beaver - created ponds and ponds artificially constructed by humans. There are 14 named artificial ponds on Fort Benning. Several of these are managed for recreational use through fertilization and fish stocking, whereas several are abandoned and 1 (Victory Pond) is used for Ranger training. The numbers, sizes and characters of beaver ponds are changing constantly. Common plants found in or around impounded water communities include white water lily (*Nymphaea odorata*), watershield (*Brasenia schreberi*), yellow pond lily (*Nuphar lutea*), buttonbush, tag alder (*Alnus serrulata*) and wax myrtle.

3.1.4.8. Other Altered Areas

This group includes altered areas such as old fields, pastures, abandoned farmland and manicured lawns. Dominant vegetation may include broomsedge, bahia grass (*Paspalum notatum*), browntop millet (*Urochloa ramosa*) or Bermuda grass (*Cynodon dactylon*). Associated species vary with location and habitat and typically inlcude weedy successional species.

3.1.4.9. Plantations

This vegetative type includes areas planted in even-aged pines, which would historically be forested in 1 of the natural pine communities listed in this section. Approximately 16,000 acres of loblolly and slash pine (*Pinus elliottii*) were planted on Fort Benning from 1962 to 1994. Since the 1990s, forest management goals have shifted from wood production to ecosystem restoration. In pre-colonial times, loblolly pine is thought to have naturally occurred only in drainages or other areas naturally excluded from frequent fires. Slash pine is not native to the area, but has been planted in plantations throughout the Southeast. Shortleaf pine is native to Fort Benning, but is thought to have occurred mostly in areas that were infrequently burned. These species, when dominant in areas where they historically would have been uncommon or absent because of soils, fire return intervals or other environmental conditions, are often referred to as **"off-site."** Loblolly, slash and shortleaf pine stands, particularly plantations, are being converted to longleaf pine where stands are in decline due to site constraints, insect infestations

or disease and where longleaf would have historically been the dominant species. These conversions are being implemented in order to regenerate stands to longleaf pine before the off-site pine stands reach traditional rotation ages. Additionally, abandoned wildlife openings are being converted to longleaf pine where appropriate. Uneven-aged management is used to manage both natural and planted longleaf stands.

Post-Transformation, Fort Benning had approximately 15,931 acres of even-aged or underplanted pine plantations on the Installation, of which 12,501 acres (78.5%) are <30 years old (Fort Benning Land Management Branch (FBLMB), unpub. data). More information about timber management on Fort Benning can be found below in Section 3.1.7 of this document.

3.1.4.10. River Floodplains and Cypress-Tupelo Swamps

The Chattahoochee River floodplain and its associated backwaters and tupelo swamps, are found in the southwestern portion of the Installation. Plant communities are dominated by flood tolerant species, such as swamp blackgum, 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, green ash (*Fraxinus pennsylvanica*), elms (*Ulmus* spp.), flowering dogwood, hackberry (*Celtis occidentalis*), ironwood and various oaks. Common shrubs include American holly, blueberries (*Vaccinium* spp.), dwarf pawpaw (*Asimina parviflora*), and viburnums (*Viburnum* spp.). Vines, grasses and herbaceous plants are common and varied and include switch cane.

3.1.4.11. Seasonal Depression Ponds

Seasonal depression ponds are upland depressions which typically have a pronounced seasonal fluctuation in water level, filling in the winter and often drying completely in the summer. Dominant species and other species present vary widely among ponds. During some years, the deepest zone in the center of the depression may remain inundated. Some ponds that remain inundated may include wetland trees and shrubs such as swamp black gum and buttonbush. Shallow water and intermittently exposed edges may contain a variety of emergent and wetland plants including narrow-fruit horned beaksedge (*Rhynchospora inundata*), small-fruit spikerush (*Eleocharis microcarpa*), horsetail spikerush (*E. equisetoides*) creeping rush (*Juncus repens*), soft rush (*J. effusus*), and maidencane (*Panicum hemitomon*).

3.1.4.12. Small Stream Swamps and Wooded Seepage Bogs

The braided streams which are characteristic of this group are found scattered across the northern half of the Installation. Sweetgum, water oak, willow oak and river birch are dominant overstory species. American holly, red bay and sweetbay (*Magnolia virginiana*) are common in the understory. Shrubs include titi, bayberry (*Myrica heterophylla*), dog-hobble and fetterbush. Understory herbaceous species are sparse, but common species include sedges (*Carex* spp.), sphagnum moss and netted chain-fern (*Woodwardia areolata*).

Wooded seepage bogs are depressions fed by side-slope seepage from the surrounding uplands. Standing water may be present during some parts of the year. Tree bases are usually buttressed, ground-cover diversity is low and ferns are common. Dominant overstory species include swamp blackgum and willow oak. Understory species include poison sumac (*Toxicodendron vernix*), red maple and sweetbay. Shrubs may include viburnum. Common ferns include netted chain-fern, cinnamon fern (*Osmunda cinnamomea*) and southern lady fern (*Athyrium asplenioides*).

3.1.4.13. Stream Floodplains

Stream floodplains at Fort Benning are extensive and the associated plant communities vary somewhat with geographic location on the Installation. Oaks, hickories, sycamore, beech, ash and elms dominate the overstory. Loblolly and spruce pines (*P. glabra*) are scattered throughout these communities. Common understory species are red maple, flowering dogwood, silverbells (*Halesia carolina*), witch hazel, redbud, ironwood, tag alder and American holly. Shrubs include blueberries, sweet gallberry, dwarf pawpaw, wax myrtle and spicebush (*Lindera benzoin*). Herbaceous species include switch cane, longleaf spanglegrass (*Chasmanthium sessiliflorum*), may-apple (*Podophyllum peltatum*) and Atamasco lily (*Zephyranthes atamasco*). Common woody vines are muscadine grape, greenbriers, poison ivy, Virginia creeper and crossvine. Relict trillium, a Federally Endangered plant, occurs in 5 populations along stream floodplains.

3.1.4.14. Successional Upland Deciduous or Mixed Forests

This group includes a variety of natural and disturbance-related forests dominated by sweetgum, red cedar (*Juniperus virginiana*) and hardwoods, including hickories, oaks, red maple, tulip poplar and black gum (*Nyssa sylvatica*). Loblolly pine may be dominant in areas. Species composition depends on soil type, moisture regime and level of disturbance.

3.1.5. UNIQUE ECOLOGICAL AREAS

In accordance with DoD Instruction 4715.3, Fort Benning has identified several areas that either have unique or rare ecological characteristics or that represent the best example on Fort Benning of a particular habitat or plant community type (Figure 3-7). These areas were chosen based on characteristics of soil type, topography, slope, aspect, elevation, hydrology, flora, fauna and other biotic and abiotic features. Some areas contain remnant native plant communities that have experienced minimal disturbance relative to similar communities elsewhere. As a result, a few areas, or portions thereof, require little or no active management in order to maintain their condition. Such areas can serve as reference sites for the biodiversity and ecological processes associated with represented natural communities. To preserve the ecological integrity of these areas, Fort Benning uses the designation of Unique Ecological Areas (UEAs) to ensure future land-use planning and training activities take into account their presence and preservation policy.

Designation as a UEA shifts management emphasis from a single species to a community focus, a key element in ecosystem management. Since UEAs represent some of the rarest or highest quality habitats on Fort Benning, they receive priority for management activities and monitoring efforts. In some cases, such as in hardwood bottomlands, no "active" management is required. Such areas are monitored for unauthorized disturbances and surveys are conducted to determine the presence of Federally Threatened and Endangered species. Some UEAs receive active management in the form of timber harvesting and prescribed burning.

UEAs receive priority for soil erosion projects, invasive species control, longleaf pine reforestation, road closures and strict adherence to best management practices (BMPs) for timber harvesting and soil erosion control. Further development of the UEA concept will include a determination of the conservation significance of such areas, better-defined boundaries and buffers and a specific management plan for each UEA (Prior et al. 2005).

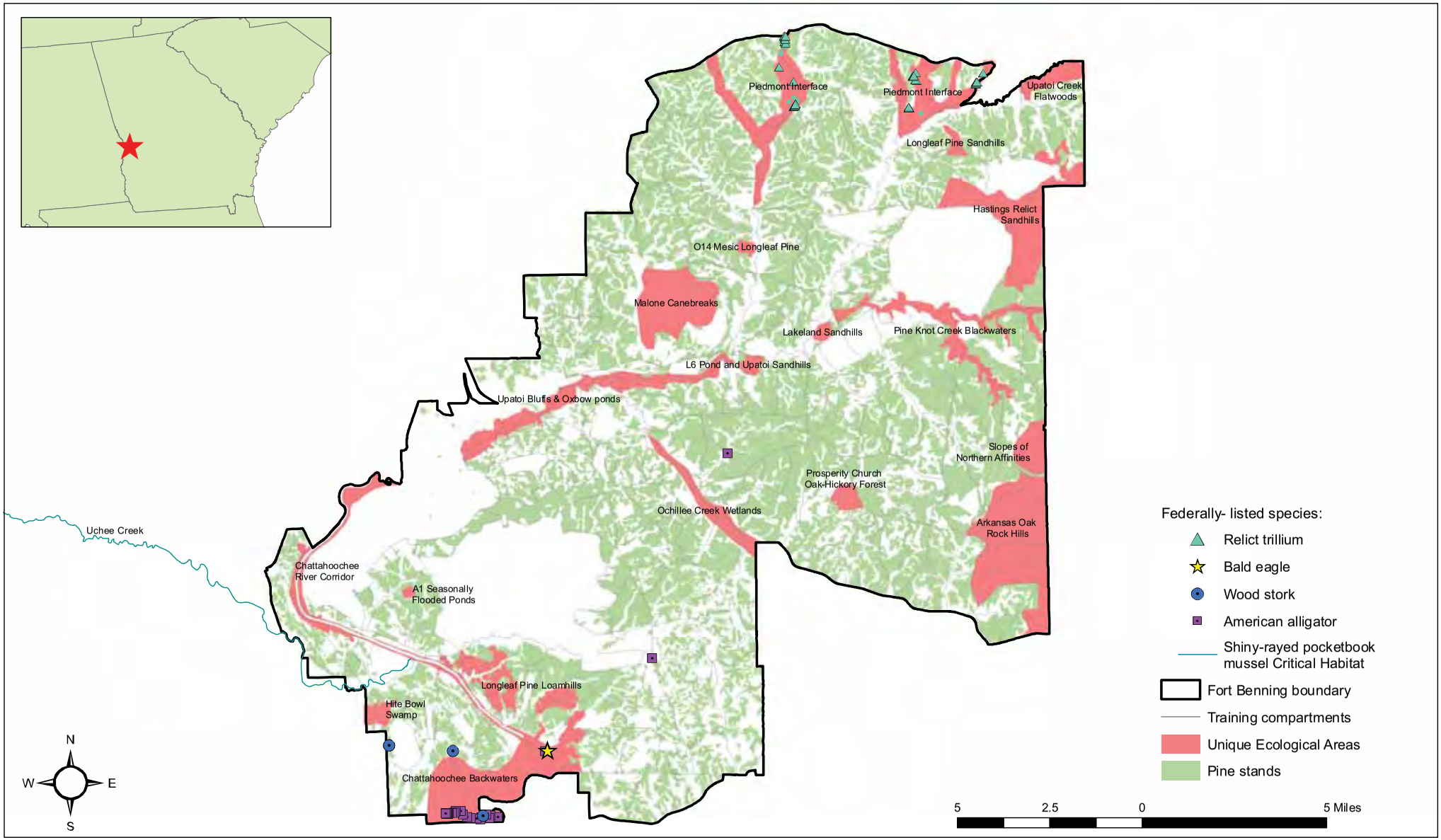


Figure 3-7. Unique Ecological Areas and known occurrences of Federally-listed relict trillium, wood stork, Shiny-rayed pocketbook mussel and American alligator on Fort Benning.

MCOE projects could potentially affect UEAs by direct vegetation clearing or by indirect effects such as increased edge effect. These impacts will be addressed in detail in the EIS for the proposed action.

3.1.6. SITE PRODUCTIVITY

According to the USDA soil surveys, site indices for pine species that occur on the Installation range from 60 to 100 (USDA 1983, 1997) (Figure 3-8). Site index data collected by Fort Benning, however, show longleaf pine site indices ranging from 46 to 105, loblolly pine from 34 to 155, shortleaf from 50 to 100 and slash pine from 50 to 100. These data were collected for dominant and codominant pines of each stand, with a base age of 50 years (S. Hudson, Fort Benning, pers. comm.). Figure 3-9 shows the site indices calculated using Fort Benning data and 2003 stand configurations. The delineation and composition of many stands have changed, however, this dataset contains the most complete site index data. Of 138,210 acres of pine-dominated habitat that have site index data this dataset, 6,183 acres (4.5%) have a low site index (<60) (Figure 3-9).

3.1.7. CURRENT HABITAT MANAGEMENT

3.1.7.1. Management of Pine Stands For RCW Habitat

Past agricultural use, logging operations, the planting of off-site pine species and fire suppression have left Fort Benning with a relatively young (Installation-wide average approximately 45 years old (FBLMB, unpub. data)) forest that is highly fragmented by military development and, in some areas, large even-aged pine plantations. Information on the pre-colonial, "natural" ecosystem on Fort Benning is limited, however, it is generally accepted that longleaf pine was at least a significant component, if not the dominant species, in the area. Research is currently being conducted on Fort Benning to further qualify this assumption (see Section 8).

Historical records show that up to 75% of Fort Benning was cleared of timber prior to 1920. The Installation continued to be subjected to extensive timber harvesting throughout the 20th century (Doresky et al. 2004). From the 1930s to the 1970s, measures were taken to rehabilitate eroded areas, including widespread planting of loblolly pine; these trees have become the primary source of RCW cavity trees and foraging habitat on the Installation (Ecological Society of America and SEMP 2008).

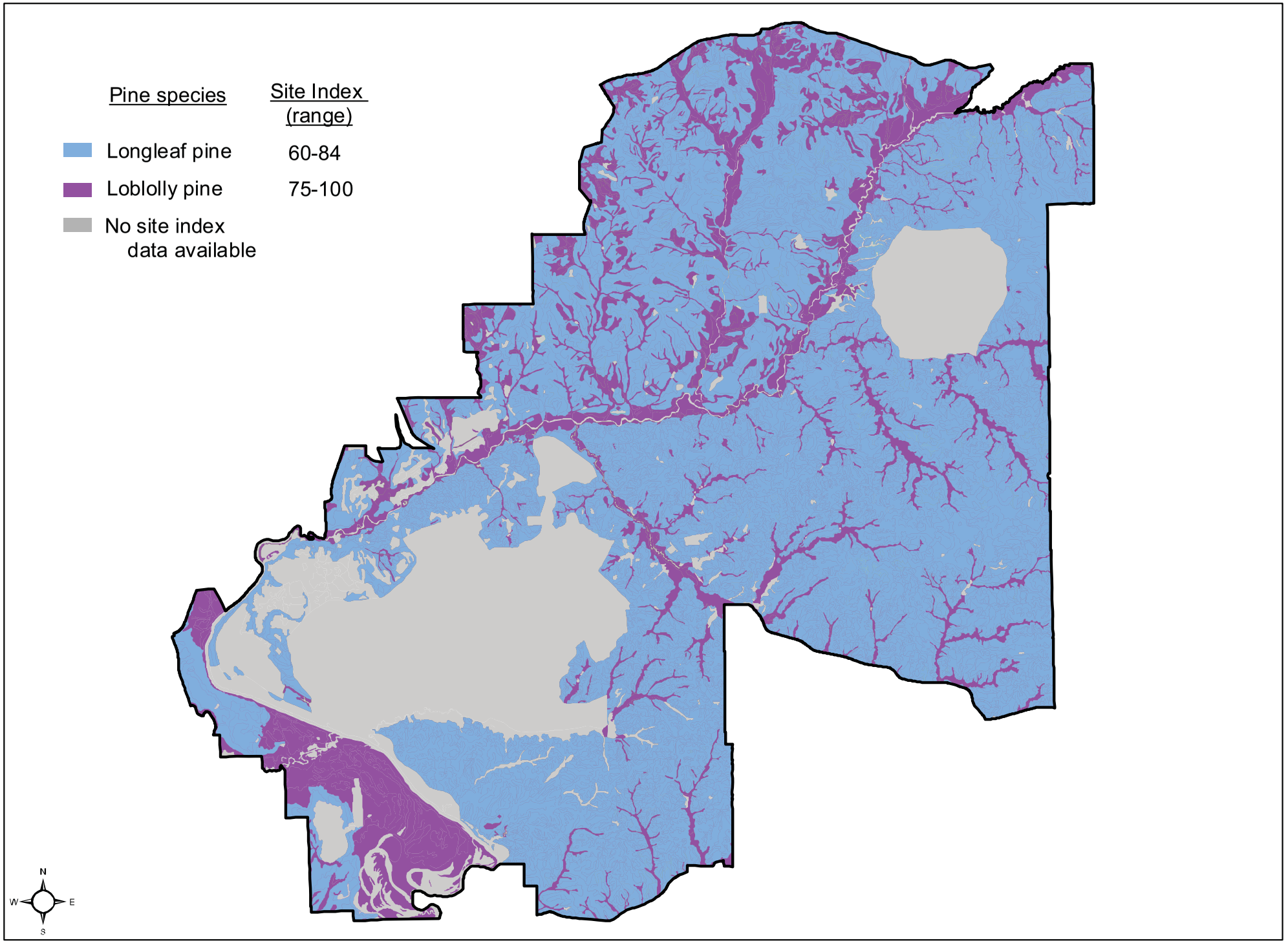


Figure 3-8. Site indices of pine species growing under historic conditions on Fort Benning (not necessarily current canopy species). Source: US Department of Agriculture. Natural Resources Conservation Service. 1990. Soil survey of Chattahoochee and Marion Counties, Georgia.

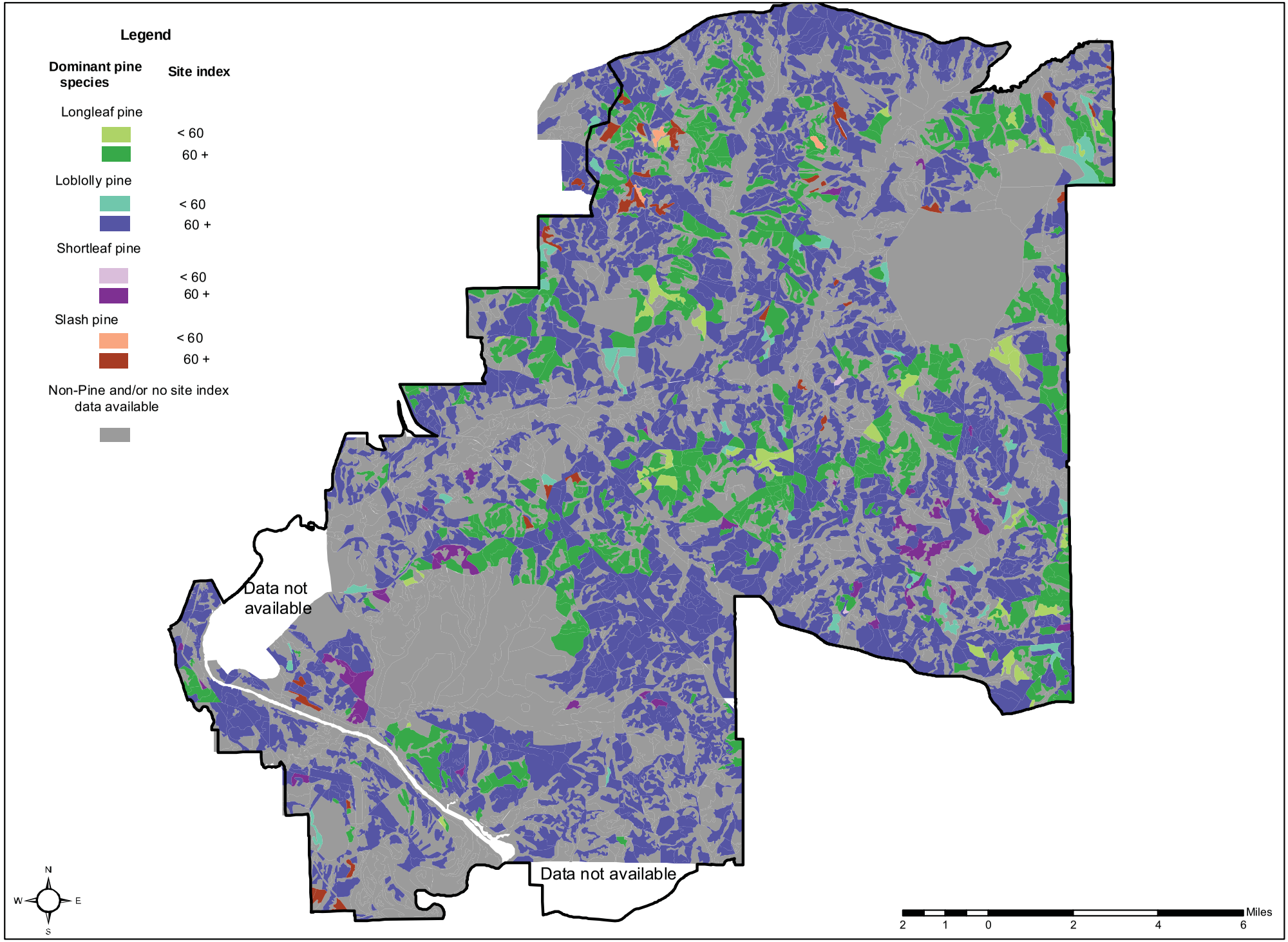


Figure 3-9. Site indices of dominant pine species on Fort Benning. Data collected by Fort Benning Land Management Branch, Fort Benning, Georgia 1980-2001.

Post-Transformation, approximately 79,371 acres would remain on Fort Benning that would be managed to provide mature pine forest for RCWs (Figures 3-10 and 3-11). Management goals for these areas include eventual conversion of off-site pine and hardwood stands to longleaf pine, prescription burning pine stands on a 3-year rotation and limiting hardwood midstory encroachment (Fort Benning 2002). Fort Benning's goal is to transition all pine stands into uneven-aged management, following the Stoddard-Neel management strategy. This approach differs from others by focusing less on annual yield and more on long-term maintenance of the ecosystem (Joseph W. Jones Ecological Research Center 2002). Per the ESMP, all acreage on the Installation that is managed for RCWs is scheduled for burning on an average 3-year fire return interval (Fort Benning 2002). Burns are conducted during the growing season (March- May) when possible, but winter burns are also used to reduce fuel loads, to introduce variation in the burning regime, to keep stands on the 3-year schedule that could not be burned 'on time' because of military mission use, ozone season or weather restraints and to maintain stands with little to no midstory (Fort Benning 2002). As of October 2008, Fort Benning had burned 28,483 acres of pine-dominated habitat in 2008, 13,532 of which was burned during the growing season (S. Hudson, Fort Benning, pers. comm.).

All managed stands on the Installation are inventoried once every 10 years (10% of the Installation is inventoried every year) (Fort Benning 2002). Data collected includes standard timber cruise data such as forest type, the quantity, size classes and species of trees in the stand, data required by the 2003 RCW Recovery Plan such as hardwood midstory and herbaceous groundcover (USFWS 2003a), crown health, evidence of insect/ disease damage, number of snags per acre and other property-specific data. This provides managers with a current comprehensive dataset for use when preparing timber prescriptions as well as for keeping track of RCW habitat availability and suitability.

Stand Composition. In 2003, stands dominated by loblolly pine were estimated to comprise approximately 70% of the pine stands ≥30 years old at Fort Benning (Doresky et al. 2004). In 2008, post-Transformation, approximately 47% (30,584 of 65,096 acres) of the pine stands ≥30 years old were dominated by loblolly pine or mixed pine and 26% (17,184 of 65,096 acres) were longleaf pine (Table 3-1), 2% (1,294 of 65,096 acres) were shortleaf or slash pine and the remaining 25% did not have a pine species specified. Conversely, as a result of Fort

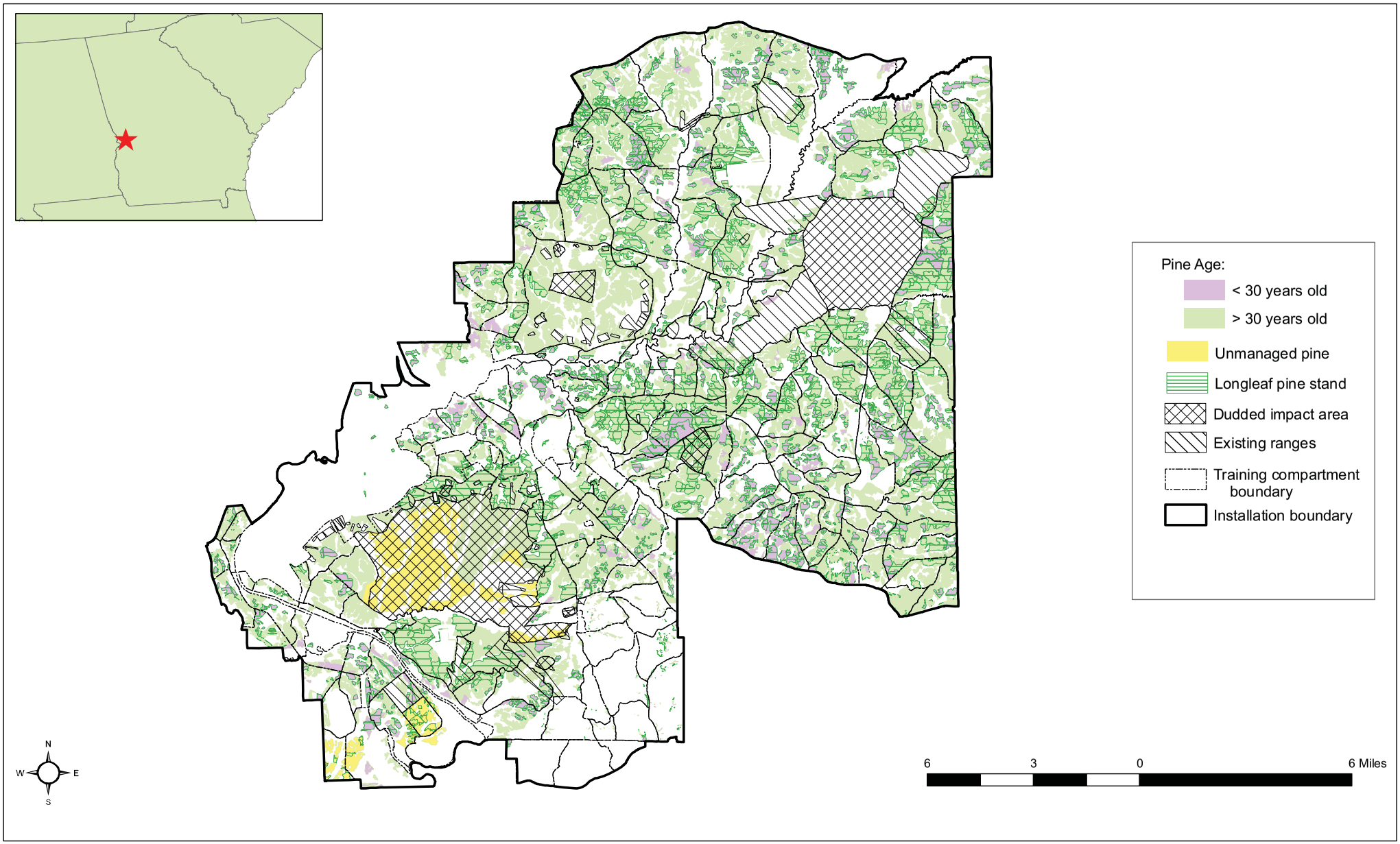


Figure 3-10. Pine stands by age and species on Fort Benning once Transformation projects are implemented.

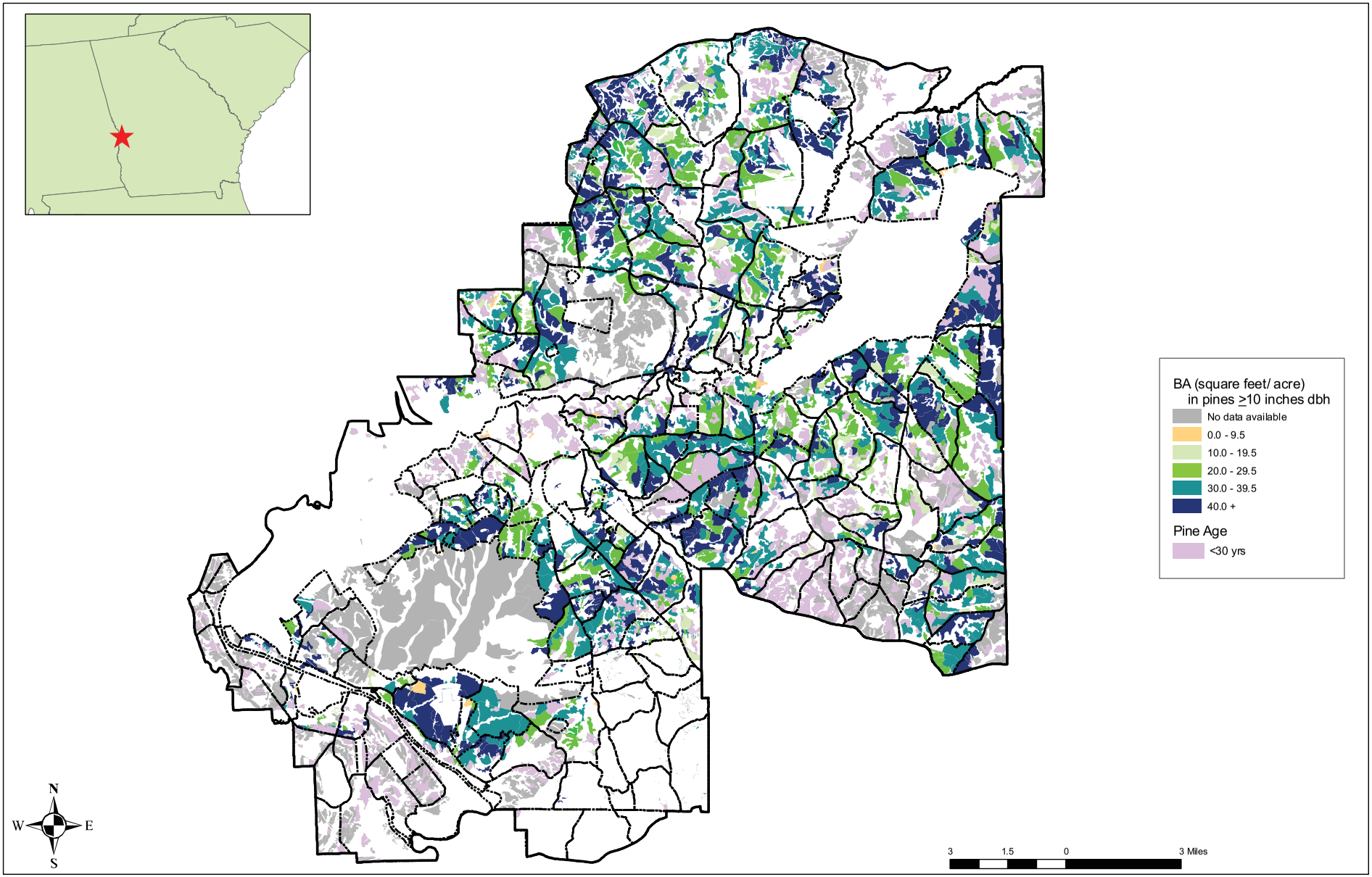


Figure 3-11. Pine stands by age and average basal area (BA) in pines >=10 inches diameter at breast height (dbh) post-Transformation.

Table 3-1. Post-Transformation baseline conditions of all managed stands on Fort Benning.

Dominant overstory species	Stands <30 yrs. old		Stands >=30 yrs. old		Total	
	Stands <30 yrs. old (acres)	% of total pine stands <30 yrs.	Stands >=30 yrs. old (acres)	% of total pine stands >=30 yrs	Total (acres)	% of total acreage
Longleaf pine	11,699	81.9%	17,184	26.4%	28,883	36.4%
Loblolly pine	1,599	11.2%	23,416	36.0%	25,015	31.5%
Shortleaf pine		0.0%	430	0.7%	430	0.5%
Slash pine		0.0%	865	1.3%	865	1.1%
Mixed pine	33	0.2%	7,168	11.0%	7,201	9.1%
Undesignated pine species	944	6.6%	16,033	24.6%	16,977	21.4%
Total	**14,276**	----	**65,096**	----	**79,371**	----

Benning's efforts to restore longleaf pine, 79% of the pine acreage <30 years old was planted longleaf pine (11,270 of 14,276 acres) (USACE 2007b; FBLMB, unpub. data) (Figure 3-10).

RCW cavity trees. In 1993, TNC reported that there were 1,807 RCW cavity trees on Fort Benning: 1,303 loblolly pines, 424 longleaf pines and 80 shortleaf pines (TNC, unpub. data). Data collected in 2008 by FBCB personnel documented 2,791 RCW cavity trees: 1,469 loblolly pines, 1,260 longleaf pines, and 62 shortleaf pines. These data show a large increase in the number of longleaf pines with RCW cavities from 1993 to 2008 (from 23.4% of all cavity trees to 45.1%). This is mainly due to the provisioning of inserts and drilled cavities. In 2008, there were 931 trees with artificial cavities. Of these, 817 (87.8%) were in longleaf pines. Additionally, 455 of 1338 (34.0%) of all active cavities were artificial, indicating the positive role that artificial cavities have had upon the population (USACE 2007b, FBCB, unpub. data).

3.1.7.2. Habitat Conditions

Site conditions. On Fort Benning and at various locations in GA, AL, South Carolina (SC) and Louisiana, land managers have observed an increasing number of pine stands "declining in function and productivity," a condition that has been termed "pine decline." In 2007, the Ecological Society of America and SEMP organized a workshop with more than 40 experts to assess the "state of the science" pertaining to pine decline and to develop short and long-term management recommendations. Four workgroups from the workshop developed review papers in their areas of expertise. A technical report prepared by Ecological Society of America and SEMP (2008) summarizes the workshop, review papers and available literature.

The majority of observations of decline have been in the Sandhills physiographic region, near the interface of the Piedmont province and either the East Gulf Coastal Plain or the Atlantic Coastal Plain physiographic regions. Symptoms are most common in mature loblolly pine and in mature mixed loblolly and shortleaf pine stands, however symptoms have been reported in longleaf stands as well. Most reported occurrences have involved off-site, planted pines, stands that are ≥50 years old and/or stands planted in high densities (Ecological Society of America and SEMP 2008).

Pine decline symptoms are similar to, and have been mistaken for, both senescence and littleleaf disease, the latter caused by at least 2 soil-born fungi, *Phytophthora cinnamomi* and *Pythium* sp. These symptoms include progressively thinning crowns, reduced crown vigor,

reduced radial growth, root deterioration and premature death (Eckhardt et al. 2004a; Ecological Society of America and SEMP 2008). Symptoms generally appear between 30 and 50 years of age, with subsequent death at ≥50 years of age (Ecological Society of America and SEMP 2008), but have been observed in younger stands (Eckhardt et al. 2004a).

A notable decline in forest health has been documented on Fort Benning since 1994, according to data collected using the US Forest Service (USFS) Forest Inventory and Analysis and Forest Health Monitoring protocols, as well as crown vigor data collected during periodic stand inventories. In addition, the mortality rates of RCW cavity trees has increased significantly since 1994 (Imm et al. 2008).

Reviews of Fort Benning RCW cavity tree mortality data and a loblolly decline study conducted on Fort Benning suggest that trees noted as having poor crown vigor tend to die within 3 years. Additionally, the majority of trees with fair crown health tend to degrade to poor crown health within 10 years. A review of forest inventory data in 2008 revealed that in loblolly pines ≥10 inches (in.) diameter at breast height (dbh), 10.3% were classified as having poor crown vigor and 77.4% were fair (Imm et. al. 2008).

Potential causes. Pine decline is thought to be caused by a combination of factors which alone would typically not cause mortality. These factors include pathogens, insects, site factors, age and stress (Eckhardt 2005; Ecological Society of America and SEMP 2008). These components are often present in healthy stands without ever causing decline symptoms. When trees are weakened by a disturbance, this can create an environment that is conducive to the insect vector and that is vulnerable to the pathogen, thereby triggering a decline in tree health from which trees do not recover (Eckhardt 2005). Disturbance, as pertaining to forest decline, can be categorized as anthropogenic (silvicultural (e.g. logging, prescribed fire)), recreational or training activities (e.g., heavy maneuver) or natural (weather, drought) and affects tree health by damaging the roots, bole or crown and/ or compacting the soil (impacting hydrology and nutrient absorption).

The primary pathogen associated with symptoms of loblolly decline in particular is one or more species of vascular stain fungi (*Leptographium* spp.). A likely insect vector of this fungus is a bark beetle (*Hylastes* sp.). A similar decline condition has been observed in longleaf pines in recent years. Symptoms are similar to those of loblolly decline, but involve a specific

vascular stain fungi (*Leptographium serpens*). Research on both types of decline is being conducted at Fort Benning and is described in Section 8.

Climate is also thought to play a role in pine decline. Droughts have become more frequent in recent years and the region experienced a period of high temperatures and low precipitation from 1999-2001: 3 growing seasons. In addition, variability of year-to-year weather patterns has increased. These conditions hinder root growth and could make pines more vulnerable to health problems (Ecological Society of America and SEMP 2008). While climate change has not been specifically studied at Fort Benning, Burke et. al. (2006) indicated that the frequency of droughts is projected to increase over the southern US by the 2040s, and increase further by the 2090s. Additionally, temperatures are expected to increase by approximately 4 degrees by 2090 (Burke et. al. 2006).

Management implications. For any pine woodlands on moist or dry sites, regardless of decline, it has been recommended to constrict military training to fewer, permanently altered sites rather than using many sites that are used in rest-recovery rotation; the recovery phase is not likely to be long enough for regeneration of the natural vegetative community (Trame and Harper 1997). Preventative recommendations for pine decline relative to military training, particularly heavy maneuver training, also include restricting activity to as small of an area as feasible (vs. spreading training out over a large area) and for vehicles to stay as far as possible from the crown edge (recommended 50 ft. from crown edge or drip line) in order to keep vehicles off of tree roots (L. Eckhardt, Auburn University, pers. comm.).

Prescribed burning in loblolly and/ or shortleaf pine stands presents a management challenge. Fire is considered to be a disturbance that can contribute to decline, particularly when compounded with other impacts such as training. Fire is also an integral component of the desired longleaf pine ecosystem, however, and is essential to control regeneration of hardwoods and off-site pine species, promote the growth of native herbaceous species and maintain the open forest structure ideal for RCW management.

In order to help predict areas which are most susceptible to decline, in 2004, researchers from Louisiana State University Agricultural Center completed a model that weighed factors that have been associated with decline, including slope and aspect. One product of this work was a "Loblolly Decline Risk Map" containing a Geographic Information Systems (GIS) layer that shows the areas on Fort Benning which, if forested with loblolly or shortleaf pine, are at high,

moderate, low or minimal risk of decline (Figure 3-12). Disturbance, as defined above, greatly increases the chances of decline, specifically in the moderate and low risk zones. Loblolly or shortleaf stands can be productive in these zones if disturbance is minimized.

In addition to decline, there is an ongoing problem with disease and insect damage in off-site pine stands. Slash pine is the only local pine species that does not seem to be affected by the pathogens associated with decline (L. Eckhardt, Auburn University, pers. comm.), however, it is highly susceptible to other problems such as fusiform rust and ice damage (R. Larimore, FBLMB, pers. comm.). Off-site stands on Fort Benning are generally more susceptible to insect and disease problems than they would be in their natural habitat, particularly on sites where the topsoil was historically degraded by agriculture and/or timber operations and in areas that receive frequent fire. Figure 3-13 shows dominant pine species on Fort Benning post-Transformation and, where applicable, associated decline risk. Section 5.3.5 describes how these data were used in analyses in this document.

As described above in Section 3.1.7.1, much of the mature pine forest that the Installation's RCW population is dependent upon is dominated by loblolly pine. Research and observations suggest, however, that loblolly pine may not well-suited for long-term production in the Fort Benning area. The properties where decline has been observed are primarily public properties whose primary goals are not timber production. Commercial timber companies typically manage loblolly pine on a short rotation and trees are harvested before they reach the age when symptoms would occur. It is possible that, given the history of soil erosion, soil compaction and disturbance on Fort Benning, it may not be possible for loblolly pine stands to reach maturity in sufficient densities to provide suitable nesting or foraging habitat for the RCW. "The decline of loblolly at this age and size on these sites may thus be entirely predictable and normal, with few proven measures to prevent it" (Ecological Society of America and SEMP 2008).

3.1.7.3. Installation-Wide Habitat Restoration

It has been reported that Fort Benning contains the largest RCW population strongly reliant on off-site loblolly pines. This is a concern to Installation land managers because of the overall poor health of the off-site stands due to forest decline (described above) and other factors. A potential population bottleneck could occur if the loss of mature loblolly pines exceeds the

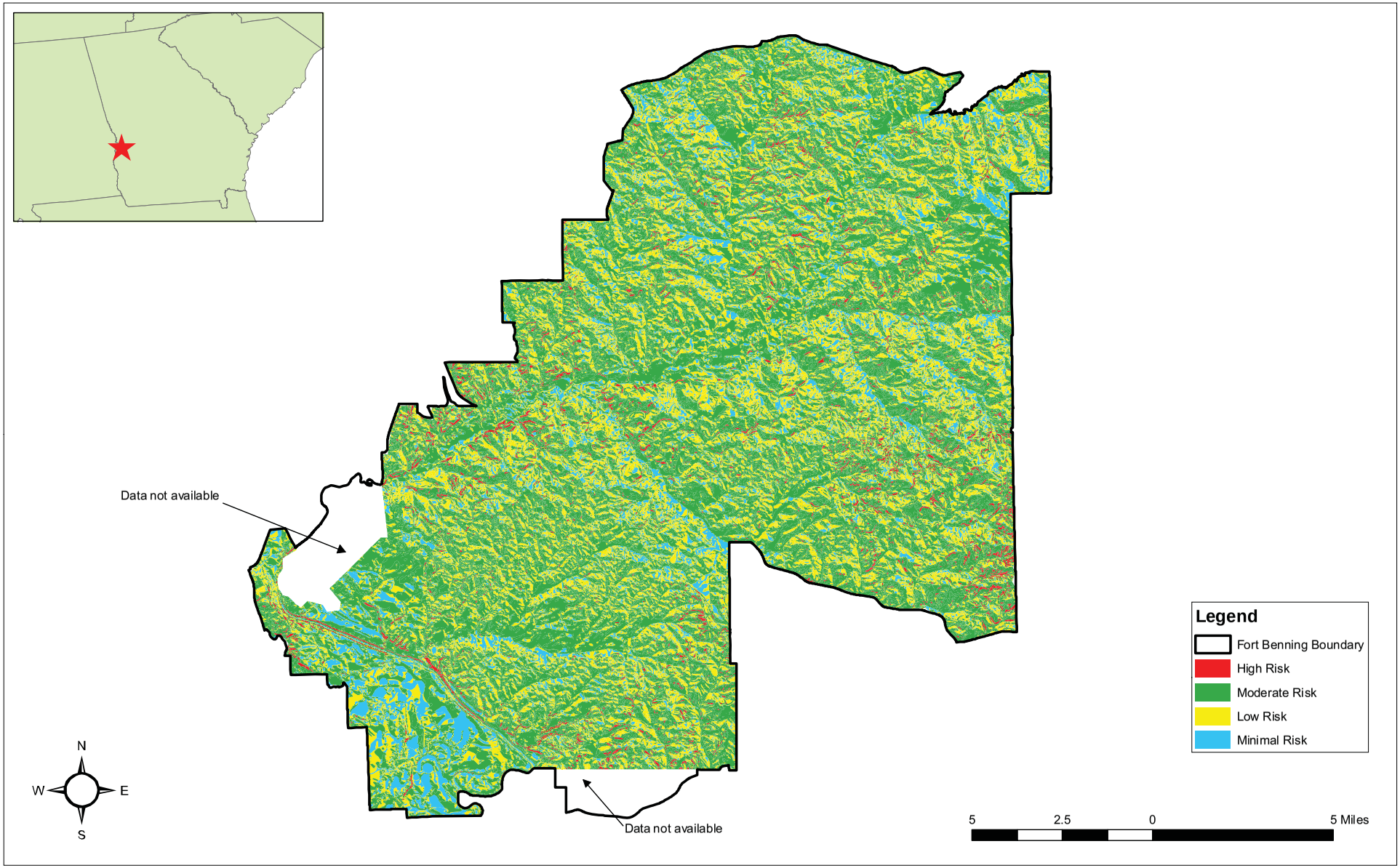


Figure 3-12. Pine Decline Risk Map for Fort Benning showing the risk of decline if areas are forested in loblolly or shortleaf pine (Louisiana State University Agricultural Center, 2004).

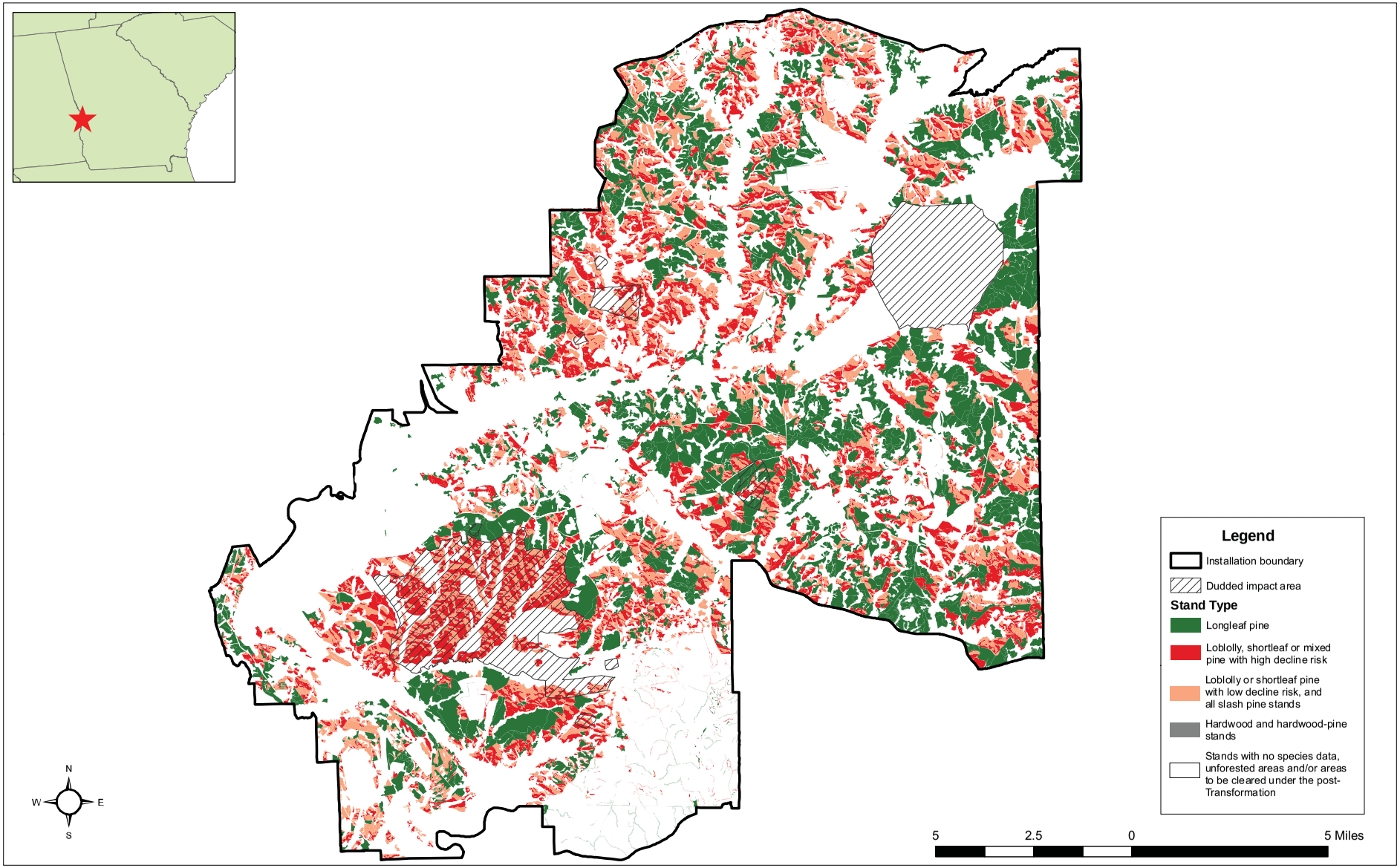


Figure 3-13. Dominant pine species on Fort Benning Post-Transformation and, where applicable, associated risk of decline.

replacement rate of longleaf regeneration (Doresky et al. 2004; Ecological Society of America and SEMP 2008).

In order to address the ongoing loss of current and potential RCW habitat due to declining or otherwise unhealthy stands of off-site pine species, Fort Benning plans to continue and intensify its efforts to convert loblolly, shortleaf and slash pine stands to longleaf pine. Details of large-scale habitat restoration/ reforestation on Fort Benning are currently being discussed with USFWS through informal consultation and will be a significant portion of the next INRMP and subsequent BO.

Approximately 962 acres were planted in longleaf plantation between 1989 and 1994 (FBLMB, unpub. data). Following the 1994 JBO, Fort Benning began aggressively regenerating longleaf pine on all appropriate sites. Approximately 1,000 acres have been planted annually in longleaf pine since 1995, with approximately 1,250 acres in 2006, 1,285 acres in 2007 and 1,629 acres in 2008 (as of August) for a total of 16,516 acres planted to date (FBLMB, unpub. data). This has been accomplished by clear-cutting and converting unhealthy/ unproductive off-site pine stands and by thinning mature off-site stands and underplanting with longleaf pine. Approximately 2,926 acres of the above total have been underplanted with longleaf pine. Fort Benning is in the process of identifying upland hardwood stands that could be converted to pine. This action could potentially add substantial acreage of RCW habitat to Fort Benning.

Of the 16,516 acres planted in longleaf to date, approximately 3,574 acres have been or will be permanently cleared for Transformation and other approved projects, leaving 12,942 acres (FBLMB, unpub. data).

Fort Benning intends to complete off-site pine and/or upland hardwood-pine stand conversions to longleaf pine as quickly as feasible to ensure future RCW habitat, however, there are risks associated with altering too much habitat within a short time frame. Care must be taken to minimize "shock" to the ecosystem as well as to maintain, at a minimum, sufficient mature pine habitat to support the current RCW population. Additionally, due to the risk of unforeseen circumstances (e.g., natural disasters or potential mortality from *Leptographium serpens* (see Section 3.1.7.2)), as much additional mature habitat should be preserved as is practicable. Another potential conflict exists between training and young pine stands: typically, training restrictions are necessary within plantations for the first 10-20 years after planting in order to protect seedlings and saplings from damage from mechanized and dismounted training.

Consideration must also be given when scheduling timber harvests to ensure that enough acreage remains available for training, in the appropriate areas, so as not to impede Installation training missions.

Despite the risks described above of large-scale stand conversion to longleaf pine, all of the Fort-Benning-specific management recommendations generated by participants in the 2007 forest decline workshop included restoration of, and conversion to, longleaf pine as quickly as time, budgets and RCW habitat requirements allow, with stand management prioritized according to stand health (the Ecological Society of America and SEMP 2008). While there have been observations of younger longleaf having a higher mortality rate in recent years (Imm et al. 2008) and observations of *L. serpens* affecting longleaf pine (L. Eckhardt, Auburn University, unpublished report), longleaf pine stands are still considerably healthier than the alternative (off-site pine stands).

Stand treatments vary with the location and condition of the stands. The choice of whether to underplant or clear-cut depends on a variety of factors including the health and likelihood of survival of the "leave" trees, whether or not the stand is within a RCW foraging habitat partition and, if within a partition, how much other habitat is available to the resident RCW group. For instance, unhealthy stands that are not within a RCW foraging partition may be clear-cut and replanted with longleaf pine, while similar stands that provide vital RCW foraging habitat may be thinned from below, chemically treated for hardwood control, prescription-burned and underplanted with longleaf pine.

Partly in preparation for Transformation and the proposed action, the Installation is in the process of shifting its timber schedules in order to prioritize those areas that will have restricted or limited access once proposed ranges and cantonment projects are constructed (e.g., within SDZs) and as training uses of areas change (e.g., within concentrated Maneuver Areas (see Section 4.7)). Fort Benning is also incorporating timber clearing needs for proposed projects into the schedule, as well as any management needed within active RCW partitions affected by Transformation or the proposed action (see Section 9) and/ or inactive recruitment clusters necessary for continued population growth. For efficiency, most treatments will be conducted on the compartment-level, accomplishing as much management as possible with a single entry. Research currently being conducted on underplanting and forest decline at Fort Benning (Section

8) will provide valuable information in determining which treatment methods are best for each stand.

The rate at which stands will be converted or underplanted will be dependent upon formal consultation with USFWS for the next INRMP. Estimates in the Transformation Biological Assessment showed that if 1,500 acres continue to be planted in longleaf pine/ year, all acres managed for RCWs would be longleaf-dominated by approximately 2032 (USACE 2007b) (i.e., the last off-site pine stand conversion will be completed in 2032).

3.1.8. PROJECTED RCW "RECOVERY"

Using the average percentages of active, inactive, captured (territory occupied by a neighboring RCW group) and solitary bird clusters at Fort Benning, 421 managed clusters are needed in order to yield 351 PBGs (M. Barron, Fort Benning, pers. comm.). There must be sufficient stands of quality RCW habitat for 421 clusters, configured in such a way that every cluster has 150 acres of potential foraging habitat (unless naturally constricted by neighboring partitions). Post-Transformation (as defined in Section 3.1), an estimated 72,213 acres of contiguous, managed pine habitat will remain. Of this amount, 59,459 acres will be potential foraging habitat (calculated as all pine stands ≥30 years old in 2008 regardless of basal area (BA)). If all stands were healthy longleaf pine, which met minimum foraging habitat requirements, were contiguous to each other, had no additional loss of pine habitat (e.g., new construction projects, disease, wildfires or forest decline) and suitable trees for natural or artificial cavities were positioned ideally, 72,213 acres could support 396 RCW clusters at 150 acres/ cluster. Using the proportion of PBGs to clusters above, 396 clusters could yield 330 PBGs.

The above calculation, however, does not take existing spatial configuration, habitat contiguity or stand conditions into account. As described in Section 3.1.7, Fort Benning is facing a number of forest management challenges and is in the process of landscape-scale habitat restoration. The Transformation Biological Assessment (USACE 2007b) estimated the time when Fort Benning could support 428 clusters (the number used at that time) in longleaf pine after implementation of Transformation projects. At the earliest, sufficient acreage would be suitable nesting habitat (calculated as 80-year old pine-dominated stands) in 2082 using any species of pine or 2112 for longleaf pine (USACE 2007b). Independence from artificial cavities,

one of the criteria for delisting the species (USFWS 2003a), could add up to 20 years to this timeline (or 2132). The amount of time it will take Fort Benning to convert all off-site stands is not expected to differ greatly after the proposed projects are implemented (stand conversions are still expected to be completed in 2032), however, the amount of total acreage remaining will change.

3.2. RCW NEIGHBORHOOD, ADJACENT LANDS

For projects impacting RCWs, the Action Area must include the RCW "neighborhood," which is defined by a buffer extending beyond the directly impacted area(s) equal to the average dispersal distance of RCWs within that RCW population or subpopulation (USFWS 2005). Dispersal is defined as the movement of individuals from their natal cluster to their first breeding location, or between consecutive breeding locations (USFWS 2003a). For this Biological Assessment, dispersal distance was defined as the average distance Fort Benning RCWs have traveled from their natal cluster to find an available niche, or between consecutive breeding locations. This included birds that were part of a breeding pair, helpers to an unrelated breeding pair and solitary birds defending a vacant territory (R. Costa, USFWS, pers. comm.). Fort Benning RCW dispersal data collected over 11 years was analyzed by FBCB and revealed an average dispersal distance of 2.57 miles (M. Barron, Fort Benning, pers. comm.). This buffer was applied to all active RCW clusters impacted by the proposed action. In addition, if not already included in the RCW neighborhood, the area encompassed by the RCW survey area (methodology described in Section 5.1.1) was also included. The combination of the Installation and all adjacent areas within the Action Area was 216,748 acres (Figures 3-1 and 3-2).

The portion of the Action Area outside of the Installation boundary, but within the RCW neighborhood, includes portions of Chattahoochee, Marion, Muscogee and Talbot Counties, GA. Changes in land use adjacent to Fort Benning would potentially occur as a result of the secondary impacts of growth induced by increased numbers of personnel stationed at Fort Benning. In terms of land use, it is anticipated that primary changes would result from increased demand for residential and commercial land use and public services.

Chattahoochee County, GA is dominated by Fort Benning lands; the approximately 20% of the county that is not included within the Installation is located southeast of Fort Benning. The majority (84%) of the land use in the county and on most lands adjacent to Fort Benning are

characterized as agriculture or forestry. Approximately 12% of the county land use is low-density residential and rural residential and occurs primarily within the City of Cusseta and along State Route 26 and US Highway (Hwy.) 27-280. Single-family detached housing is the predominant residential land use. Public/ institutional land uses account for approximately 2% and are located in close proximity to the center of Cusseta (USGS 2001). Areas south of the Installation within the Action Area contain a portion of the Chattahoochee River and deciduous forest. Areas southeast of the Installation within the Action Area contain hardwood-dominated forests along the floodplains of Hichitee Creek, Halloca Creek, Ochillee Creek, Stevens Branch and Spring Branch; young (<30 years old) pine plantations; US Hwy. 27/ 280, GA Hwy. 55 and GA Hwy. 26; low-density residential areas; agricultural fields and recreational fields. A portion of the young pine stands between the Installation and Hwy. 27 were recently sold but will, at least temporarily, remain in timberlands (TNC 2006). There are a few areas visible on the 2007 aerial photography that appear to be pine stands ≥60 years old within the Action Area, however, these are separated from the Installation boundary by >200 ft. of non-habitat. Therefore, if RCWs were present in these areas, any habitat removed for the proposed action on Fort Benning would be considered noncontiguous to the hypothetical clusters off-Post. No Federally-listed species are known to occur within the Action Area off-Post in Chattahoochee County.

Marion County, GA is located on the eastern boundary of Fort Benning. No major communities are located in this county adjacent to the Installation (USGS 2001). The land immediately adjacent to the Installation is dominated by agricultural areas and pine plantations <30 years old and also contains hardwood- pine stands; floodplains of Pine Knot Creek, Little Juniper Creek and unnamed tributaries; and low density residential development, primarily along GA Hwy. 355 and county roads. Portions of the Action Area are under fee by timber companies, and other portions were recently sold. Through the Army Compatible Use Buffer (ACUB) program, TNC recently purchased an approximately 280-acre property in Marion County, 0.8 miles east of Fort Benning. This property was previously owned by a timber company and is forested in young pine. TNC has also purchased an approximately 310-acre property adjacent to the eastern boundary that is forested in young pine and a group of 3 properties adjacent to the installation's eastern boundary that total approximately 873 acres (see Section 8 and Appendix F). No Federally-listed species are known to occur off-Post within the Action Area in Marion

County, although at least one of the properties acquired by TNC is within 0.5 mile of an active RCW cluster on Fort Benning.

Talbot County, GA is located on the northeastern boundary of Fort Benning and does not include any major communities in the area adjacent to the Installation. The land uses adjacent to the Installation are described as rural agricultural areas (USGS 2001). Deciduous and pine forests make up the predominant land use within this portion of the Action Area outside of Fort Benning (Figure 3-2). Approximately 25% of the off-Post area within Talbot County and the Action Area consists of the forested hardwood floodplains of Baker and Upatoi Creeks, which form the boundary of the Installation before joining and flowing onto the Installation. An approximately 1,100-acre property in the confluence of Upatoi and Baker Creeks has been placed under a conservation easement with TNC (see Section 8.6). At most, half of this property is upland (W. Harrison, TNC, pers. comm.). There is a substantial population of relict trillium on the TNC property; no other Federally-listed species are known to occur off-Post within the Action Area in Talbot County.

Muscogee County, GA is located on the northwestern boundary of Fort Benning. Columbus is currently the third largest city in Georgia and has dramatically increased in size within the last 50 years. Land uses within the Action Area include residential and commercial developments, City municipal buildings including a prison and an animal control center, a landfill, a golf course, pastures and large, fragmented tracts of pine and deciduous forest. Cox, Randall, Dozier, Bull, Opossum, Tiger and Kendall Creeks and the Tar River run through Muscogee County and occur within the Action Area. A portion of the 1,100-acre property in the confluence of Upatoi and Baker Creeks described above in Talbot County is in Muscogee County. This property has been placed under a conservation easement with TNC and contains a relict trillium population. At most, half of this property is upland (W. Harrison, TNC, pers. comm.).

The MTP is also within the Action Area and is mostly undeveloped, however, much of the pine habitat was cleared in 2005 (JCA 2004) and 2007 (JCA 2008). This property will be used primarily as an industrial park with some land preserved for wetland mitigation. Construction of the northern half of a 4-lane road through the center of the property (the Eastern Connector), a cul-de-sac and building south of Chattsworth Rd., buildings on 2 parcels on Chattsworth Rd. and 1 building on the Eastern Connector has been completed. Timber has been

cleared for the remainder of the central road and for timber sales on approximately 462 acres in the northeastern section of the tract and approximately 337 acres in the southern section of the property (excluding RCW "protected areas") (JCA 2008). As mentioned in Section 2.4.8, Fort Benning has an obligation to provide habitat for 2 RCW clusters (N01-02 and N02-02) that have foraging partitions that overlap onto City property. Cluster N01-02 will be impacted by the proposed action. The "taken" cluster, Cluster N02-01, was inhabited by a PBG in 2008 (JCA, unpub. data).

No other Federally-listed species are known to occur within the Action Area off-Post in Muscogee County.

3.3. INSTALLATION LAND USE

3.3.1. PROJECTS CURRENTLY APPROVED AND/ OR UNDER CONSTRUCTION, PRE-TRANSFORMATION

Approved projects currently under construction on Fort Benning include an IPBC, ISBC, DMPRC, an Automated Combat Pistol/ MP Firearm Qualification Complex (CP/MPQC), a National Infantry Museum and several cantonment area projects. In addition, the Installation is, and has been, upgrading various firing points and existing ranges as funding allows. Actions associated with the development, operations and maintenance of these ranges have been assessed in separate NEPA documentation and were the subject of previous formal or informal consultations with the USFWS. The IPBC and ISBC are not expected to have RCW impacts once operational.

The DMPRC will provide a state-of-the-art range facility, enhancing the Installation's training needs for conducting effective advanced gunnery exercises in a realistic training environment. Changes in training on other existing ranges (primarily Carmouche and Hastings) will occur in order to incorporate the new DMPRC. Basic and intermediate tank and BFV training will then take place at the DMPRC, and Carmouche and Hastings ranges will be dedicated to the training of vehicular mounted weapons systems and dismounted training scenarios utilizing BFVs, Strykers and developing future technologies. RCW impacts (8 "takes") were accounted for in the DMPRC BO and subsequent informal consultation (USFWS 2004, Fort Benning 2005, USFWS 2006c). Extensive monitoring of these clusters by Fort

Benning will show what reaction the RCWs have to the range once use begins. The DMPRC is expected to be operational in 2010 (F. Weekley, Fort Benning, pers. comm.).

Habitat within limits of construction of all known ongoing projects was assumed to be 100% cleared prior to beginning analyses in this document.

3.3.2. PROJECTS EVALUATED IN THE TRANSFORMATION BO

The status of all Transformation projects are listed in Table 2-6 and the projects being reanalyzed in this document are identified. The current limits of disturbance of all Transformation projects are shown in Figure 3-14, as compared to the limits of disturbance originally evaluated in the Transformation BO (USFWS 2007a). These figures also indicate which project changes the Installation expects to remain under the Transformation BO (without a reinitiation of formal consultation with the USFWS) and which were determined to be substantial enough to warrant reanalysis of the proposed action. **Fort Benning does not wish to use this Biological Assessment as informal consultation with USFWS for "minor" Transformation project changes;** the established Fort Benning NEPA process and/or informal consultation will continue to be utilized for such changes. The updated baseline project disturbance limits were used only to reflect the most accurate pre-project habitat data possible.

Habitat within the project limits of disturbance (includes construction limits and/or areas impacted by ordnance or heavy maneuver traffic) of the Transformation projects <u>not</u> being reanalyzed was assumed to be 100% cleared prior to beginning analyses for the actions proposed in this document (see Section 5.2.1.1 for additional analysis methodology).

The statuses of projects evaluated in the Transformation BO are stated below. Descriptions are given for ranges and larger cantonment projects; small projects with zero or minor environmental impacts are listed in Table 2-6.

3.3.2.1. <u>Training Area Roads</u>

Approximately 120 miles of roads or tank trails were analyzed for Transformation for either construction, repair or upgrade. All but 2 sections of road are being reanalyzed in this Biological Assessment. Two segments of a road near the Oscar Small Arms Range Complex will remain the same as they were analyzed in the Transformation Biological Assessment. The

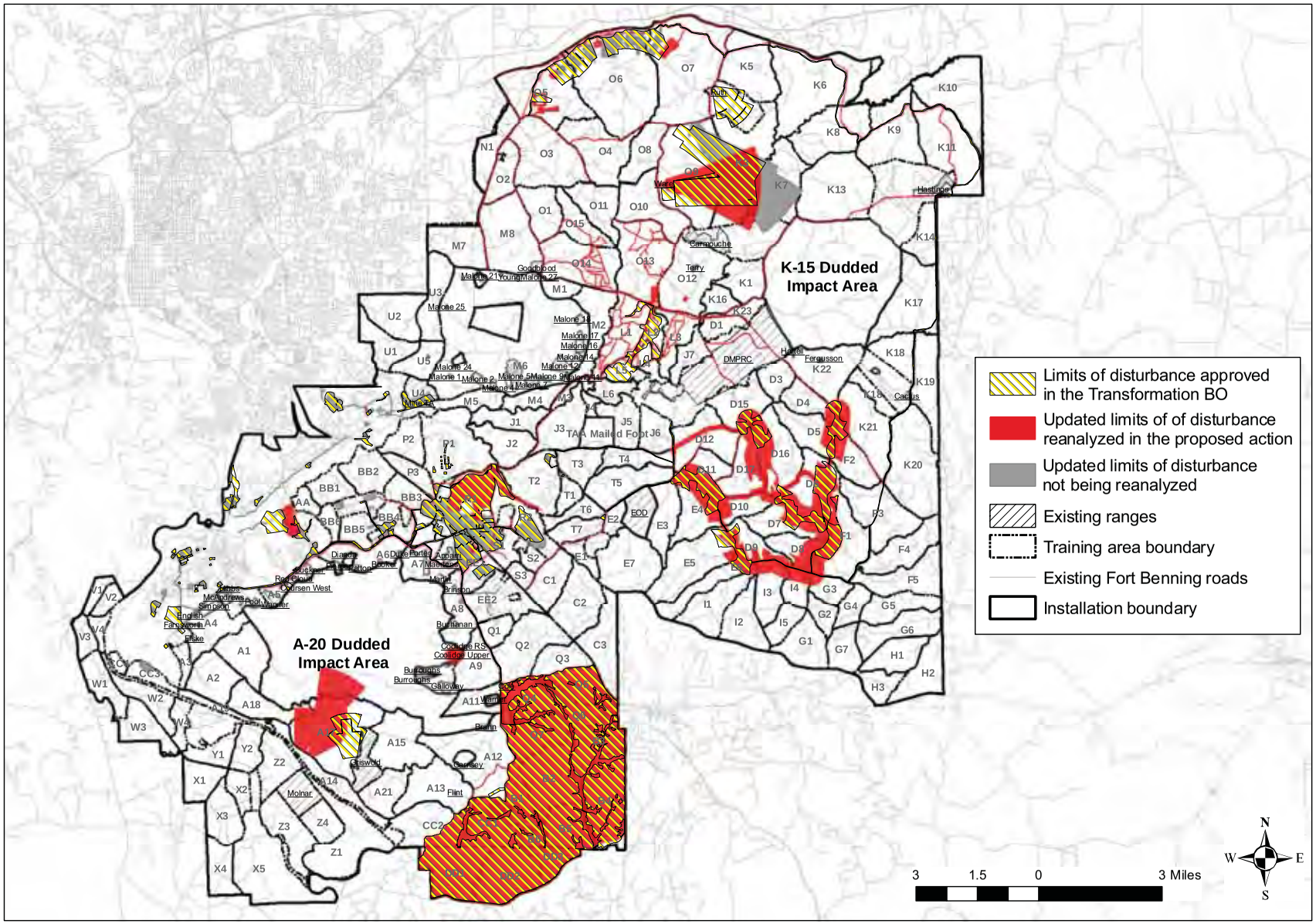


Figure 3-14. Current limits of disturbance of all Transformation projects (including projects being reanalyzed in the proposed action, Alternative A (Preferred Alternative)), as compared to the limits of disturbance approved in the Transformation Biological Opinion (BO).

the original routing of these segments was determined to be necessary for timber clearing and construction of the FY 2008 ranges. These segments will be used as a construction road, which is being assessed via the Fort Benning NEPA process. The proposed asphalt road will follow the construction road as much as practicable (J. Parker, FBLMB, pers. comm.).

An estimated 29 new water crossings were also discussed in the Transformation Biological Assessment and BO, however, the locations were not certain. These will be funded as part of their respective road or maneuver area projects and specific locations will be analyzed under the proposed action.

The routing for the road analyzed in the Transformation Biological Assessment for access to the Oscar Range Complex has changed and is being reanalyzed in this document.

3.3.2.2. Cantonment Areas

3.3.2.2.1. Harmony Church

The Harmony Church area has historically supported, a diverse assortment of low density facilities including the Infantry Fighting Vehicle Maintenance and Gunnery Training Facility, semi-permanent barracks, motor pool facilities, administrative facilities, an ammunition supply point and various recreational fields. The area south of Harmony Church in Compartments EE1 and EE2 contains various administrative and training facilities that support the Sniper and Ranger schools. Many areas with demolished buildings have been reclaimed and planted in longleaf pine in the last 10 years.

Transformation projects in the Harmony Church area roughly doubled its size to approximately 1,420 acres. Up to 957 acres of pine habitat would be impacted by Transformation actions, of which 808 acres were ≥30 years old. Of the 957 acres, approximately 320 acres of longleaf pine ≥30 years old and 141 acres of longleaf <30 years old would be impacted (USACE 2007b).

Of the 25 projects that were evaluated in the Transformation BO (USFWS 2007a) in the Harmony Church area, 3 are currently under construction, 5 are in the final planning/design stages, 3 are in intermediate planning/design stages, 2 are in initial planning stages and 5 are being reanalyzed as part of the proposed action due to location changes and/or expansions (Table 2-6) (K. Witter and K. Holloway, Fort Benning, pers. comm.).

A Tracked Vehicle Drivers Course (PN 64797) is included in the 5 reanalyzed projects mentioned above, however, **only an access road is being reanalyzed as part of the proposed action**; the limits of disturbance of the Course itself were treated as a Transformation project not requiring reanalysis. This project is scheduled for 2009 to be used by students enrolled in many of the training courses described in Section 4.7.2. This area will contain integrated Basic and Advanced Driver Training Courses for wheeled and tracked vehicles. Training requirements include a variety of multi-surfaced driving sections with terrain variations. The driving courses will include underpasses and other aspects of urban terrain. Light fixtures on the Tracked Vehicle Drivers Course will replicate urban driving conditions in order to support training with night vision equipment under "wash-out" conditions.

The limits of construction have shifted slightly since the Transformation BO and have been reduced from 201 acres to 186 acres, in Compartment R2 east of existing driver training facilities at Suitor Hill (Figure 4-1).

Reanalyzed projects include an access road to the Tracked Vehicle Drivers Course (PN 67457) scheduled for 2009, a Vehicle Recovery Course (PN 72017) scheduled for 2009, a Recreation Center (PN 65246) scheduled for 2012, a Physical Fitness Center (PN 65248) scheduled for 2012 and an expansion of a Rail Loading Facility (PN 62953) scheduled for 2012.

3.3.2.2.2. Kelley Hill

Kelley Hill, which is principally accessed by Marne and Ivy Rds., supports a concentrated area (approximately 400 acres) of development for troop housing, plus community and maintenance facilities. As part of Transformation, various buildings within Kelley Hill were approved for construction or conversion. In addition, road and infrastructure improvement projects would occur along the Marne and Ivy Rds. Corridors. Projects in Kelley Hill collectively required clearing of approximately 85 acres of pine habitat, of which 75 acres were ≥30 years old. Approximately 47 acres were forested in longleaf pine ≥30 years old and 11 acres were in longleaf pine <30 years old.

Of 5 projects evaluated in the Transformation BO (USFWS 2007a) in the Kelley Hill area, 1 is in intermediate planning stage (Table 2-6) (K. Witter, Fort Benning, pers. comm.).

3.3.2.2.3. Main Post

The 8,850-acre Main Post cantonment area includes a mix of low density to high density land uses including troop and family housing, training ranges, administrative, community, maintenance, supply and storage, outdoor recreation, medical and industrial facilities. Lawson Army Airfield is located on the southwest side of Main Post.

Transformation actions included infill development for various uses, including troop housing and medical, administrative, community and operational facilities. The majority of the Transformation projects on Main Post were building conversions and construction in historically developed areas; these projects collectively required clearing of 2.35 acres of pine habitat, half of which were forested in longleaf pine.

Of 15 Transformation projects evaluated on Main Post, one is under construction, one is in the initial design stage and one, the Hospital Replacement (PN 70235/ 65081/ 67461), is being **reanalyzed as part of the proposed action** (Table 2-6) (K. Witter and K. Holloway, Fort Benning, pers. comm.).

3.3.2.2.4. Sand Hill

Existing land uses within the 2,510-acre Sand Hill cantonment area consist primarily of trainee barracks and supporting community facilities. Transformation actions included additional barracks and community facilities, expansion of the health and dental clinic and a chapel. Collectively, Sand Hill projects required the removal of approximately 109 acres of pine habitat, of which approximately 102 acres were ≥30 years old. Approximately 15 acres were longleaf pine ≥30 years old and there were no longleaf stands <30 years old.

Of 8 Transformation projects in the Sand Hill area, one is currently under construction, one is in final planning/design stage, 2 are in intermediate planning/design stages, and one, a Recreation Center (PN 65246), is being **reanalyzed as part of the proposed action**.

3.3.2.3. Ranges

Approved construction projects in the training areas include several new ranges, a Combined Arms Collective Training Facility (CACTF) and road construction and repairs.

Range area projects are described below.

3.3.2.3.1. Northern Ranges

The northern range area is used for a variety of training exercises by USAIS and tenant units and contains small arms and large-caliber ranges, dudded and nondudded impact areas, heavy maneuver areas, an airstrip and numerous other training facilities.

A Tank/ Fighting Vehicle Stationary Gunnery Range (ST) 1 (PN 65382) is in the final planning/design stages and will be built between Ruth and Ware Ranges, west of the K15 Impact Area. This range is programmed for 2008 and will be used for the USAARMS One Station Unit Training (OSUT) courses (Table 2-6) (K. Witter, Fort Benning, pers. comm.).

The CACTF, Phase II (PN 62207) is planned for 2010 and will be at 3 locations in Compartments T1, T2 and T7. This project is designed to integrate all major urban challenges, accommodating up to battalion-size TRADOC and FORSCOM units in a variety of urban and suburban settings. An approximately 21-acre "residential" area south of First Division Rd. and west of Pine Tree Rd. will contain a school, 6 residences, a soccer field, a vehicle service station and a farmstead. A 2 acre military compound will be west of Pine Tree Rd. and CACTF Phase I and will contain a jailhouse and administrative building. A 6-acre "shanty town" will be located at the corner of Pine Tree and Hourglass Rds., east of McKenna Air Strip, and will contain several multipurpose buildings and a barracks building (Table 2-6).

Tank/ Fighting Vehicle Stationary Gunnery Range 2 (PN 65383) was analyzed in the Transformation Biological Assessment in the northern range area at the existing Ware Range, south of ST 1, west of and firing into the K15 Impact Area. **This project is being reanalyzed as part of the proposed action** (Table 2-6).

3.3.2.3.2. Oscar Complex

A small arms complex (Oscar complex) similar to the existing Malone complex is being constructed along the northern edge of the Installation.

Fire and Movement (FM) Range 1 (PN 65032) will be located in the Oscar Complex in Compartment O5. This range design is complete and is programmed for FY 2008 (Table 2-6) (T. Marston, Fort Benning, pers. comm.). FM1 will be used for the USAARMS OSUT to train and test Soldiers on basic fire and movement techniques against stationary infantry targets.

Modified Record Fire Range 2 (PN 65044) is also complete and is programmed for FY 2008 (Table 2-6) (T. Marston, Fort Benning, pers. comm.). This range will be adjacent to the FM 1 Range and will consist of the range, a general instruction building, ammunition breakdown building, bleacher enclosure, range operations and control center, range operations/ storage building, latrine, covered mess and range control tower. Students in the USAARMS OSUT will identify, engage and defeat stationary infantry targets for day/ night qualification requirements with M16 and M4 rifles.

Three MRF ranges (MRF3, MRF4 and MRF6) (PNs 65045, 65046 and 65048) are programmed for FY 2008 in the Oscar Complex. The range designs for these MRF ranges are complete. An additional MRF range (MRF5) (PN 65047) is programmed for FY 2009 and is currently at 60% design. It will be at 95% design in December 2008 (Table 2-6) (T. Marston, Fort Benning, pers. comm.). These ranges will be similar to MRF 2 (PN 65044).

Two Rifle/ Machine Gun Zero (Z) Ranges (Z3 and Z4) (PNs 65037 and 65038) are planned for the Oscar Complex in FY 2009 and are currently at 60% design. They will be at 95% design in November 2008 (Table 2-6) (T. Marston, Fort Benning, pers. comm). Primary facilities at each range will include 32 lanes with targets at 10 and 25 meters, a security barrier, range operations and control area, operations/ storage building, general instruction building, latrine, bleacher enclosure, covered mess and ammunition breakdown building. These ranges will be used to train and test individual Soldiers in USAARMS OSUT and Basic Officers Leaders Course (BOLC) III courses on the skills necessary to align sights and practice basic marksmanship techniques against stationary targets using M16 and M4 series rifles and crew-served machine guns.

Three other Zero ranges, Z1, Z2 and Z5 (PNs 65035, 65036 and 65039), **are being reanalyzed in this document** due to changes in location (Table 2-6).

Fire and Movement Range 3 (PN 65034) will be the easternmost range in the Oscar Complex. **This range is being reanalyzed as part of the proposed action.**

3.3.2.3.3. Southern Ranges

The Armor Officer Basic Course Headquarters Complex (PN 65286) project is scheduled for 2009 and will include a classroom facility in the Southern Range area to accommodate Soldiers training in the Good Hope Maneuver Area. This facility was to be built on an 18-acre

site in Compartment A12 between Jamestown and Sunshine Rds., but has been moved to a site within the Good Hope Maneuver Area. A utility corridor will also be constructed to connect the facility with areas in Harmony Church (Table 2-6).

An Automated Combat Pistol/ MP Firearm Qualification Complex (CP/MPQC) (PN 65079) was planned to go at the existing Course East Range, south of First Division Rd. and firing into the A20 Impact Area. **This project has been cancelled under the preferred alternative of the proposed action** (Table 2-6)**.**

A Qualification Training Range (QTR) (PN 67012) was proposed for south of the A20 Impact Area in Compartment A17 for use by 3rd ID/ 3rd Bde and 3rd BCT. **This project has been cancelled under the preferred alternative of the proposed action** (Table 2-6)**.**

A MPMG (PN 65070) was assessed in the Transformation Biological Assessment in Compartments K3 and K4 at the site of the existing Ruth Range. **This range is being reanalyzed as part of the proposed action** (Table 2-6)**.**

4. DESCRIPTION OF THE PROPOSED ACTION

The USFWS and NMFS define an "action" as "all activities or programs of any kind authorized, funded or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water or air (50 CFR 402.02)."

The following section describes the purposes and initiatives driving the proposed MCOE actions, associated personnel increases, action alternatives, construction projects, USAARMS training courses and maneuver training land use. The proposed action includes all actions described in this section, as well as the ongoing conservation efforts described in Section 8 and minimization efforts described in Section 9.

4.1. PURPOSE AND NEED

The purpose of the proposed action is to accommodate existing and newly identified realignments due to BRAC and other Transformation initiatives (such as GDPR, AMF and AP3), as well as to support increased training requirements related to the MCOE, Army Growth and the GWOT.

The underlying purpose of the proposed MCOE actions is to implement:

- BRAC 2005 and Transformation projects that have substantially changed in size or location from those evaluated in the Transformation Biological Assessment (USACE 2007b).
- Newly identified operational and training asset needs for Transformation actions.
- Operational and training asset needs for the newly created MCOE.
- Projects to support the anticipated increase in student numbers due to Army Growth and the GWOT.

The overarching need for the proposed action is for Fort Benning to: 1) adjust construction of projects evaluated in the Transformation Biological Assessment, 2) to ensure the complete stand-up of the MCOE and 3) to provide sufficient operational facilities, training areas

(including ranges and maneuver areas) and infrastructure to accommodate the increased military personnel and students due to Army Growth and the GWOT.

In accordance with 40 CFR, Section 1502.4 of the NEPA implementing regulation, and the Army NEPA Regulation (32 CFR 651, also known as AR 200-2), the Army has determined that the BRAC 2005 and Transformation realignment actions that have been reconfigured and/or newly identified, funded, planned and/or programmed, as well as those projects associated with the MCOE, Army Growth and the GWOT, are all activities closely related to each other both in location and time on Fort Benning and, therefore, their potential environmental effects are being evaluated together in this Biological Assessment.

4.2. DRIVING DIRECTIVES AND INITIATIVES

The primary drivers for the proposed projects are project changes subsequent to the finalization of the Transformation environmental documents and Army Growth; other drivers include the GWOT and GDPR. There is a synergy amongst all of these actions within the Army as a whole and at Fort Benning. The relationship of these drivers and proposed projects are summarized below.

4.2.1. TRANSFORMATION PROJECT CHANGES

Sixteen projects (10 BRAC, 1 AMF and 5 "Non-BRAC") originally identified in the Transformation Biological Assessment (USACE 2007b) have changed locations and/or have expanded and are being reassessed in this document in order to determine whether these changes warrant reinitiation of formal consultation with the USFWS. As funding sources and PNs have changed, however, 16 projects have been split into 18 projects, 17 of which are now considered to be BRAC-directed (Table 4-1). One project that was classified as "Non-BRAC" in the Transformation Biological Assessment is now classified as AP3 (see Section 4.2.1.2) (Tables 4-1 and 4-2).

4.2.1.1. BRAC-Directed

Changes to training area projects that are now considered to be BRAC-directed include maneuver area infrastructure projects and associated maneuver training impacts (PNs 69668, 69741 (previously grouped with PN 69743 and "Non-BRAC") and 69743 (previously "Non-

Table 4-1. All projects included in the proposed Maneuver Center of Excellence actions at Fort Benning, including reanalyzed Transformation projects.

Project Driver	Project Number	Project Title	Analyzed for Transformation (Y/N)	Fiscal Year- (Start Date)	Fiscal Year- (Date Operational)	Area- Footprint, (Acres)	Area- Limits of Construction (includes range access roads) (Acres)	Area- Ordnance or Maneuver-Impacted Areas (Acres)	Maximum Acres of Pine Impacted	Location
AP3	62953	Rail Loading Facility Expansion	Y	12	----	----	133.71	----	28.05	Harmony Church
BRAC	64797	Tracked Vehicle Drivers Course Access Road	Y	09	10	----	18.15	----	9.43	Harmony Church
BRAC	65034	Fire and Movement Range 3 (FM3)	Y	10	11	10.34	43.87	35.86	50.47	Oscar Small Arms
BRAC	65035	Basic 10M-25M Firing Range 1 (Z1)	Y	09	11	0.79	23.01	3.40	23.32	Oscar Small Arms
BRAC	65036	Basic 10M-25M Firing Range 2 (Z2)	Y	09	11	0.79	20.90	27.74	28.30	Oscar Small Arms
BRAC	65039	Basic 10M-25M Firing Range 5 (Z5)	Y	09	11	0.79	22.02	0.20	19.12	Oscar Small Arms
BRAC	65070	Multipurpose Machine Gun Range 2 (MPMG2)	Y	11	12	238.19	623.81	550.97	482.73	Southern ranges
BRAC	65246	Recreation Centers	Y	12	----	----	28.28	----	3.01	Harmony Church, Sand Hill
BRAC	65248	Physical Fitness Center, Harmony Church	Y	12	----	----	38.81	----	0.76	Harmony Church
BRAC	65383	Stationary Tank Range (ST2)	Y	09	11	294.93	193.00	1,187.88	562.63	Northern ranges
BRAC	65554	Construct Training Area Roads Paved	Y	09	11	----	889.93	----	580.16	Throughout
BRAC	65557	Repair Existing Training Area Roads, Phase 1	Y	10	----	----	1,193.55	----	720.76	Throughout
BRAC	69358	Range Access Road - Good Hope Maneuver Training Area	(Y)	09	11	----	162.01	----	99.50	Good Hope
BRAC	69668	Good Hope Training Area Infrastructure	*Y	09	11	----	1,676.83	10,019.07	4,661.58	Good Hope
BRAC	69741	19D/K OSUT Training Area Infrastructure	(Y)	09	11	----	871.76	----	623.96	Northern ranges
BRAC	69743	Southern Training Area Infrastructure	*Y	09	11	----	577.22	4,086.40	3,035.86	Northern ranges
BRAC	70235/ 65081/ 67461	Hospital Replacement	*Y	**08	----	----	137.36	----	2.75	Main Post
BRAC	72017	Vehicle Recovery Course (Ground Mobility Division)	*Y	09	11	----	514.37	----	277.26	Harmony Church
BRAC	64551	Multipurpose Training Range (MPTR)	N	09	----	983.93	488.02	1,382.88	875.88	Northern ranges
BRAC	65033	Fire and Movement Range (FM2)	N	09	11	10.34	71.43	32.51	89.07	Oscar Small Arms Complex
BRAC	65043	Modified Record Fire Range (MRF 1)	N	09	11	23.72	46.76	32.73	58.88	Oscar Small Arms
BRAC	65049	Modified Record Fire Range (MRF 7)	N	09	11	23.72	48.68	37.53	79.53	Oscar Small Arms
BRAC	65078	Anti-Armor Tracking & Live Fire Complex (LA-AR1)	N	09	----	22.52	57.31	6.66	42.95	Southern ranges
BRAC	65250	Maneuver Battle Lab	N	10	----	----	26.90	----	0.00	Main Post
BRAC	67457	Infrastructure Support, Incr 2. Includes security fence and direct buried cable	N	09	----	----	114.80	----	56.81	Northern ranges and Harmony Church

BRAC Base Realignment and Closure
GWOT Global War on Terror
GTA Grow the Army
GDPR Global Defense Posture Realignment
AP3 Army Power Projection Platform

*Y Project analyzed under a different PN or no PN in Transformation Biological Assessment
(Y) Project combined with other PNs in Transformation Biological Assessment
Location different in Alternative A and B
** Project funded in FY08, however, construction will be ≥ FY 09

Table 4-1 (cont.). All projects included in the proposed Maneuver Center of Excellence actions at Fort Benning, including reanalyzed Transformation projects.

Project Driver	Project Number	Project Title	Analyzed for Transformation (Y/N)	Fiscal Year- (Start Date)	Fiscal Year- (Date Operational)	Area- Footprint, (Acres)	Area- Limits of Construction (Acres)	Area- Ordnance or Maneuver-Impacted Areas (Acres)	Maximum Acres of Pine Impacted	Location
GTA	69147	Trainee Complex Upgrade	N	09	----	----	81.36	----	4.13	Sand Hill
GTA	69150	Classrooms & Dual Battalion Dining Facility	N	10	----	----	65.74	----	0.60	Sand Hill
GTA	69151	Dining Facilty to Support AST Training	N	10	----	----	10.14	----		Main Post
GDPR	69406	Unit Maintenance Facilities	N	09	----	----	50.54	----	1.89	Main Post
BRAC	69742	Northern Training Area Infrastructure	N	09	11	----	240.23	----	175.04	Northern ranges
GTA	69745/ 72322/ 72324	Training Barracks Complex, Phases 1, 2 and 3	N	10, 11 and 12	----	----	130.80	----	71.19	Sand Hill
GWOT	69999	Warrior in Transition Complex	N	09	----	----	20.84	----	0.00	Main Post
GTA	70026/ 72456	Classrooms with Battalion Dining Facilities, Phases 1 and 2	N	10, 11	----	----	50.19	----	0.00	Sand Hill
GTA	70027/ 72457	Classrooms with Battalion Dining Facilities, Phases 1 and 2	N	10, 11	----	----	72.24	----	4.05	Sand Hill
BRAC	71065	Troop Store - AAFES (NAF)	N	09	----	----	5.64	----	0.00	Harmony Church
BRAC	71473	Water Treatment Plant Upgrade and Expansion	N	10	----	----	46.90	----	0.00	Main Post
BRAC	71620	Dental Clinic Addition	N	10	----	----	9.99	----	0.00	Main Post

BRAC	Base Realignment and Closure	*Y	Project analyzed under a different PN or no PN in Transformation Biological Assessment
GWOT	Global War on Terror	(Y)	Project combined with other PNs in Transformation Biological Assessment
GTA	Grow the Army		Location different in Alternative A and B
GDPR	Global Defense Posture Realignment	**	Project funded in FY08, however, construction will be ≥ FY 09
AP3	Army Power Projection Platform		

Table 4-2. **Transformation** projects being reanalyzed as part of the proposed action for the Maneuver Center of Excellence on Fort Benning.

Program Type- Transformation	Program Type- Current	Project Number	Project Title	Fiscal Year- Transformation (Start Date)	Fiscal Year- Current (Start Date)	Location- Transformation	Location- Current	Area- Footprint, Transformation (Acres)	Area- Ordnance or Maneuver- Impacted Area, Transformation (Acres)	Area- Footprint, Current (Acres)	Area- Limits of Construction, Current (Acres)	Area- Ordnance or Maneuver- Impacted Areas, Current (Acres)
Non-BRAC	BRAC	65035	Rifle/ Machine Gun Zero Range 1	2008	2009	Northern Range - Oscar Complex	Northern Ranges - Oscar Complex	0.79	38.07	0.79	23.01	3.40
Non-BRAC	BRAC	65036	Rifle/ Machine Gun Zero Range 2	2008	2009	Northern Range - Oscar Complex	Northern Ranges - Oscar Complex	0.79	48.65	0.79	20.90	27.74
BRAC	BRAC	**70235**/ 65081/ **67461**	Hospital Replacement	2009-2010	**2008	Main Post	Main Post	164.60	----	----	137.36	----
BRAC	BRAC	64797	Drivers Training Course	2009	2009	Harmony Church	Harmony Church	201.26	----	----	18.15	----
BRAC	BRAC	**72017**	Vehicle Recovery **Course**	2009	2009	Harmony Church	Harmony Church	501.10	----	----	514.37	----
Other	BRAC	65039	Rifle/ Machine Gun Zero Range 5	2009	2009	Northern Range - Oscar Complex	Northern Ranges - Oscar Complex	0.79	49.89	0.79	22.02	0.20
BRAC	BRAC	65383	Tank/ Fighting Vehicle Stationary Gunnery Range 2	2009	2009	Northern Range - Ware Range	Northern Ranges - Ware Range	676.30	213.15	294.93	193.00	1,187.88
Non-BRAC	BRAC	**69743**	Maneuver Corridor- South	2009	2009	Southern Range	Southern Ranges	----	1,838.00	----	577.22	4,086.40
BRAC	BRAC	**69668**	Good Hope Maneuver Area	2009	2009	Southern Range- Good Hope	Southern Ranges- Good Hope	----	9,498.00	----	1,676.83	10,019.07
BRAC	BRAC	65034	Fire and Movement Range 3	2010	2010	Northern Range - Oscar Complex	Northern Ranges - Oscar Complex	20.37	74.86	10.34	43.87	35.86
BRAC	BRAC	65554	Construct Installation-wide Roads, Paved	2010	2009	Installation Wide	Installation-Wide	271.16	----	----	889.93	----
BRAC	BRAC	65557	Repair Existing Training Area Roads	2010	2010	Installation Wide	Installation-Wide	281.94	----	----	1,193.55	----
BRAC	BRAC	65246	Recreation Center	2011	2012	Harmony Church	Harmony Church, Sand Hill	8.32	----	----	28.28	----
BRAC	BRAC	65248	Physical Fitness Center with Pool	2011	2012	Harmony Church	Harmony Church	34.23	----	----	38.81	----
AMF	BRAC	65070	Multi-purpose Machine Gun Range **2**	2011	2011	Northern Range- Ruth Range	Southern Ranges	238.28	166.43	238.19	623.81	550.97
Other	AP3	62953	Rail Car Storage Trackage for Deployment	2012	2012	Harmony Church	Harmony Church	94.91	----	----	133.71	----
BRAC	BRAC	***69358**	Range Access Road- Good Hope Maneuver Training Area (formerly PN 65557)	2010	2009	Southern Ranges- Good Hope	Southern Ranges- Good Hope	included in other project acreages	----	----	162.01	----
BRAC	BRAC	***69741**	19D/K OSUT Training Area Infrastructure (formerly PN 65557, in part, and "Off Road Drivers Training Area")-Alt A	2010	2009	Northern Ranges- Off Road Drivers Training Area	Northern Ranges	----	472.95	----	871.76	----
BRAC	BRAC	***69741**	19D/K OSUT Training Area Infrastructure (formerly PN 65557, in part, and "Off Road Drivers Training Area")-Alt B	2010	2009	Northern Ranges- Off Road Drivers Training Area	Southern Ranges- Good Hope	----	472.95	----	706.58	----

Project is in different locations in Alternatives A and B

bold Updated information on Transformation project

* Project was analyzed as part of other projects for Transformation

** Project funding awarded in FY 2008, however, construction will not begin until FY 2009.

BRAC")), a Vehicle Recovery Course (PN 72017), an access road to the Tracked Vehicle Drivers Course (PN 64797), training area roads (PNs 65554, 65557 and 69358 (previously included as part of PN 65557)), 3 Rifle/Machine Gun Zero Ranges (PNs 65035, 65036 and 65039 (previously "Non-BRAC")), a Fire and Movement Range (PN 65034), a Multi-Purpose Machine Gun Range (PN 65070) (evaluated in the Transformation BO as an AMF project) and a Stationary Tank Range (PN 65383). Cantonment projects being reanalyzed are 2 Recreation Centers (both PN 65246), a Physical Fitness Center (PN 65248) and a hospital replacement (PN 70235/ 65081/ 67461) (Tables 4-1 and 4-2). Further description of the changes to these projects are presented throughout this document, as they are part of the proposed action.

4.2.1.2. Army Power Projection Platform

One reanalyzed project, the Rail Loading Facility Expansion (PN 62953), that was classified as "Non-BRAC" in the Transformation Biological Assessment will support Fort Benning's AP3 mission (Tables 4-1 and 4-2).

4.2.2. BRAC-DIRECTED, NEW

The new BRAC-directed projects in the proposed action support the movement of the USAARMS to Fort Benning. Many of these projects were analyzed for cumulative effects in the Transformation EIS (USACE 2007c), but because Federal projects are not considered for cumulative effects in Section 7 of the ESA consultation (USFWS and NMFS 1998), they were not analyzed in the Biological Assessment. These projects are predominantly in the training areas and include 2 Modified Record Fire Ranges (PNs 65049 and 65043), a Multi-Purpose Training Range (PN 64551), a Fire and Movement Range (PN 65033), and an Anti-Armor Tracking and Live Fire Complex (PN 65078). One project covers infrastructure in the Northern Maneuver Area (PN 69742). Cantonment area projects include a Maneuver Battle Lab on Main Post (PN 65250), Infrastructure Support (PN 67457), an AAFES Troop Store (PN 71065), a Water Treatment Plant Upgrade and Expansion (PN 71473) and a Dental Clinic Addition (PN 71620) (Table 4-1).

4.2.3. ARMY MODULAR FORCE

The MPMG2 (PN 65070) was AMF-driven in Transformation, but is now being reanalyzed as part of the proposed action as BRAC-directed (Tables 4-1 and 4-2).

4.2.4. GDPR

In the Transformation environmental documents, GDPR actions were limited to personnel realignments increases. These personnel would be stationed either within existing facilities or accommodated in 1 of the new facilities being built in support of BRAC, AMF or other stationing actions. No construction projects specific to the GDPR actions were proposed in the Transformation documents.

There is 1 new GDPR project that is part of the proposed action, the Unit Maintenance Facilities (PN 69406) (Table 4-1).

4.2.5. GROW THE ARMY

Six new projects have been identified to accommodate Army Growth at Fort Benning, all of which are in cantonment areas: Trainee Complex Upgrades (PN 69147), a Dining Facility (PN 69151), Classrooms with Battalion Dining Facilities (PNs 70026/ 72456, 70027/ 72457 and 69150) and a Trainee Barracks Complex (PN 69745/72322/72324).

4.2.6. GWOT

One GWOT project is proposed for construction on Main Post, a Warrior in Transition Complex (PN 69999) (Table 4-1).

4.3. PERSONNEL INCREASES

Personnel increases associated with AMF, GDPR and other restationing actions in the Transformation environmental documents have not changed. Additional personnel are expected to support Transformation/ MCOE and Grow the Army initiatives.

4.3.1. TRANSFORMATION

As described in Section 2.1.2, approximately 8,357 students were expected to relocate to Fort Benning as a result of Transformation actions. Training loads have since increased for 1 Armor School training course, which will result in environmental impacts greater than those predicted for Transformation in the Southern Maneuver Area.

4.3.2. GTA

As noted in Section 1, the objective of the Army Growth Campaign plan is to permanently increase its overall end strength by about 74,200, including approximately 65,000 in the active Army, 8,200 in the National Guard and 1,000 in the Army Reserve (DA 2008). Of this amount, an increase of 30,000 Soldiers was previously authorized as a temporary increase and has now been authorized by Congress in 2008 as a permanent increase. These Soldiers were accommodated in Army units across the US. 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, totaling 118 personnel. The temporary increase has now been authorized by Congress to be established on a permanent basis and is included in this Biological Assessment.

According to an Army Growth Stationing Announcement given by Fort Benning in January 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 2012. At Fort Benning, this growth primarily translates into increased student numbers at the Armor and Infantry Schools, Basic Officers Leader Courses, Officer Candidate School and Army Airborne School (J.W. Brown, Fort Benning, pers. comm.). Although the specific training load and supporting cadre gains were not included in this announcement, the following information was supplied by the Installation for impacts analyses:

- The proposed Grow the Army projects will support 1 additional Initial Entry Training battalion at Fort Benning. This will equate to 120 cadre members and up to 1,200 Initial

Entry Training Soldiers per day (5 Companies with 240 Soldiers per Company) (J.W. Brown, Fort Benning, pers. comm.).

- There will be additional increases in training loads for advanced Infantry and Armor training, as well as Officer Candidate and Airborne School training since Fort Benning will be the only location for these training opportunities; increases will also occur in the enrollment for BOLC II, which is offered only at Fort Benning and Fort Sill, OK.
- This gain has been experienced in the Infantry OSUT courses and is expected to increase in order to meet Training Resources Arbitration Panel (TRAP) requirements. The TRAP numbers are not definite, but in FY09, 96 OSUT starts are scheduled (F. Weekley, Fort Benning, pers. comm.).
- Training loads of the Basic Combat Training Brigade have also increased as a result of the temporary personnel increase. Ultimately, 2 additional Basic Combat Training Battalions with 5 to 7 Companies each are expected (F. Weekley, Fort Benning, pers. comm.). Currently, there are 43 classes scheduled for this year, which is an increase from the 32 classes/year outlined in the RDP.

4.4. ALTERNATIVES CONSIDERED

Two action alternatives were identified that would meet the purpose and need of the proposed action, referred to in this document as Alternative A and Alternative B. The Army has identified Alternative A as its preferred alternative because, taking a variety of factors into consideration, it best meets the purpose and need of the proposed action and it is the action alternative with the least potential environmental impacts. Alternative A is therefore analyzed in this Biological Assessment as the proposed action; Alternative B and the No Action Alternative are described in Appendix A.

Personnel increases are the same in both action alternatives. Two additional ranges are proposed for Alternative B that are not in Alternative A: a Multi-Purpose Machine Gun Range (MPMG1) (PN 68733) and an Automated Combat Pistol Qualification Course (CP/ MPQC2) (PN 65079). In addition, the location where one maneuver training course will be conducted (termed the "19D/K OSUT Maneuver Area") (PN 69741) is different between the 2 alternatives.

4.5. CONSTRUCTION PROJECTS

Carrying out the requirements of the proposed action will involve constructing new facilities and renovating/ upgrading existing facilities and infrastructure to support additional Soldiers and their family members, construction of, and modifications to, ranges and training areas and increasing the use of live-fire training ranges and maneuver areas. Efforts are being made to minimize the amount of new construction needed by converting existing ranges and structures to meet the needs for the proposed MCOE actions. However, with the increase in personnel and the training requirements of current and arriving units, construction of new cantonment and range projects is necessary. New construction was sited to coincide with and/ or be a complement to:

- existing missions
- facility operations and functions
- use of existing infrastructure to the greatest extent possible
- minimizing potential impacts to the environment (e.g., avoidance of sensitive species habitat)
- locating activities on previously disturbed or developed locations

There are 4 primary cantonment areas on the Installation. These are the areas where infrastructure facilities on the Installation are typically concentrated, however, many of the proposed projects fall outside of these areas as traditionally defined. For the purposes of analysis, all non-range projects located in the general cantonment area were divided into 4 broad analysis areas using the applicable cantonment area names: Harmony Church, Kelley Hill, Main Post and Sand Hill (Figure 4-1). These broader analysis areas may therefore contain projects not typically considered 'cantonment' projects, such as the vehicle recovery course. Likewise, infrastructure projects that are located within range areas are listed within the appropriate geographic area.

Training areas are grouped into 5 general regions: Northern ranges (training areas northeast of Hwy. 27-280 and west of Lorraine Rd.), Oscar Small Arms Complex (Oscar Complex), Northeastern ranges (training areas northeast of Hwy. 27-280 and east of Lorraine

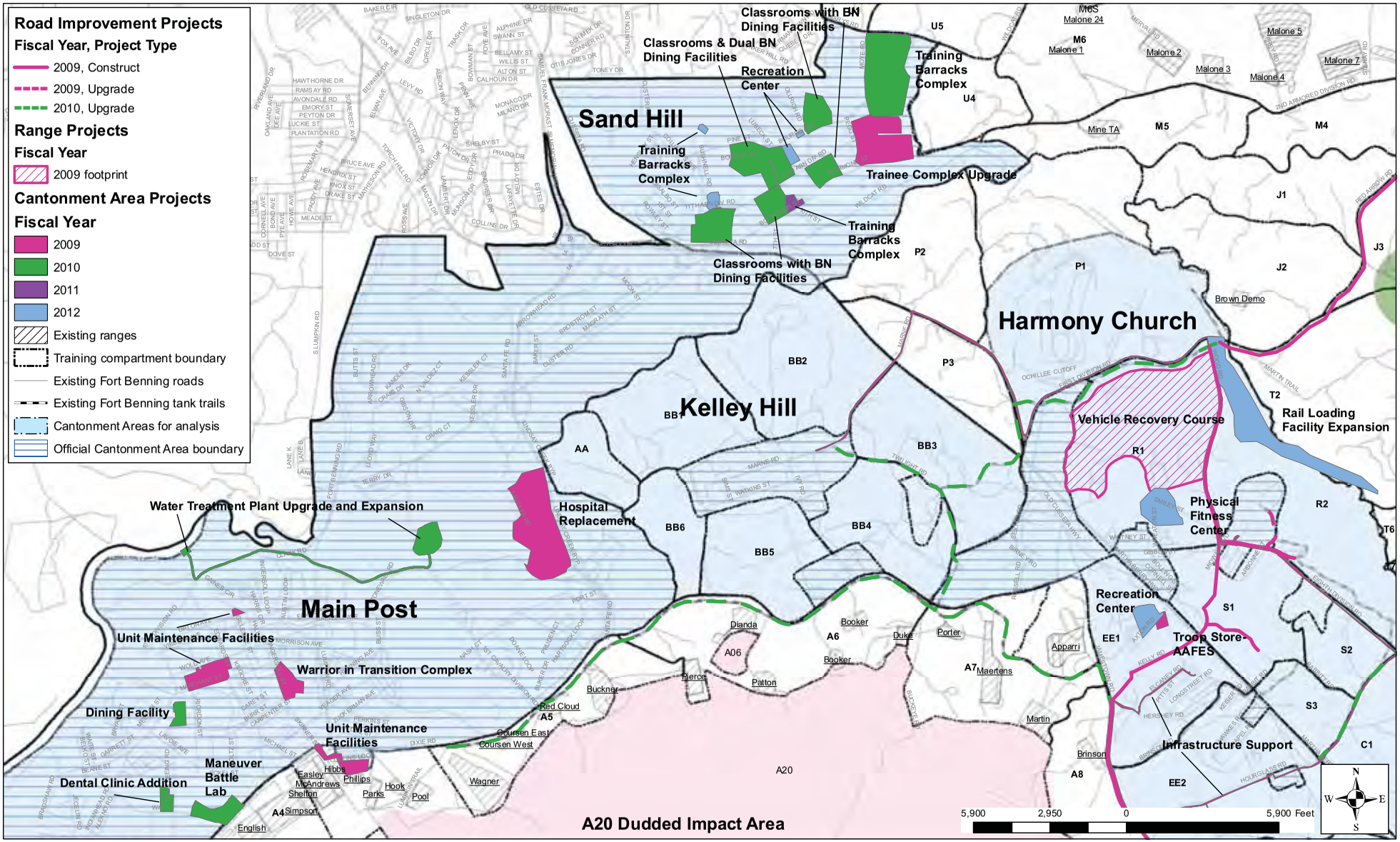


Figure 4-1. Fiscal years 2009-2012 construction activities and operational impacts for proposed projects located in the Cantonment Area for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Rd.), Southern Maneuver Area, and Southern ranges (all training areas southwest of Hwy. 27-280) (Figures 4-2 - 4-6). Table 4-1 identifies all projects (reanalyzed Transformation and new MCOE) included in the proposed action with the corresponding PN, FY in which the project is programmed for funding (the federal FY begins on 1 October and ends 30 September) and a general location. For impacts that will not occur until projects are operational, including range "beaten areas" (see Section 5.2.4 and Appendix E for explanation of beaten areas and limits of construction) and off-road heavy maneuver areas, the operational date is also presented.

Limits of disturbance for several projects overlapped and the same area could be disturbed for adjacent projects. Acreages presented below and in Tables 4-1 and 4-2 represent the maximum area disturbed by each project. Therefore, the sum of all acreages in Table 4-1 will be greater than the total acreage potentially disturbed by MCOE projects. Acreages of separate parts of the same project, however (e.g., a range footprint, limits of construction and beaten area) do not overlap. Analyses in this document were conducted so that impacts were not double-counted. The area analyzed for any individual project may not equal the maximum area disturbed for that project: overlapping acreage may be included in the analysis of another project (see Section 5.2.2).

NOTE**:** • Projects in developed areas that will not require any vegetation clearing, such as building conversions and expansions, are not described in detail below, but can be found in Tables 4-1 and 4-2 and Figures 4-1 through 4-6.

• Infrastructure projects supporting the Maneuver Areas are not listed below, but are discussed in the corresponding Maneuver Area descriptions (Section 4.7.4)

4.5.1. REANALYZED TRANSFORMATION PROJECTS

4.5.1.1. Harmony Church

A Vehicle Recovery Course (PN 72017) (FY 2009) was analyzed in the Transformation Biological Assessment in Compartment R1, northeast of, and adjacent to, Harmony Church (Figure 4-1). The location of this course has not changed, but the overall area disturbed has expanded slightly from 501 acres to 514 acres. This project will impact up to 277 acres of pine

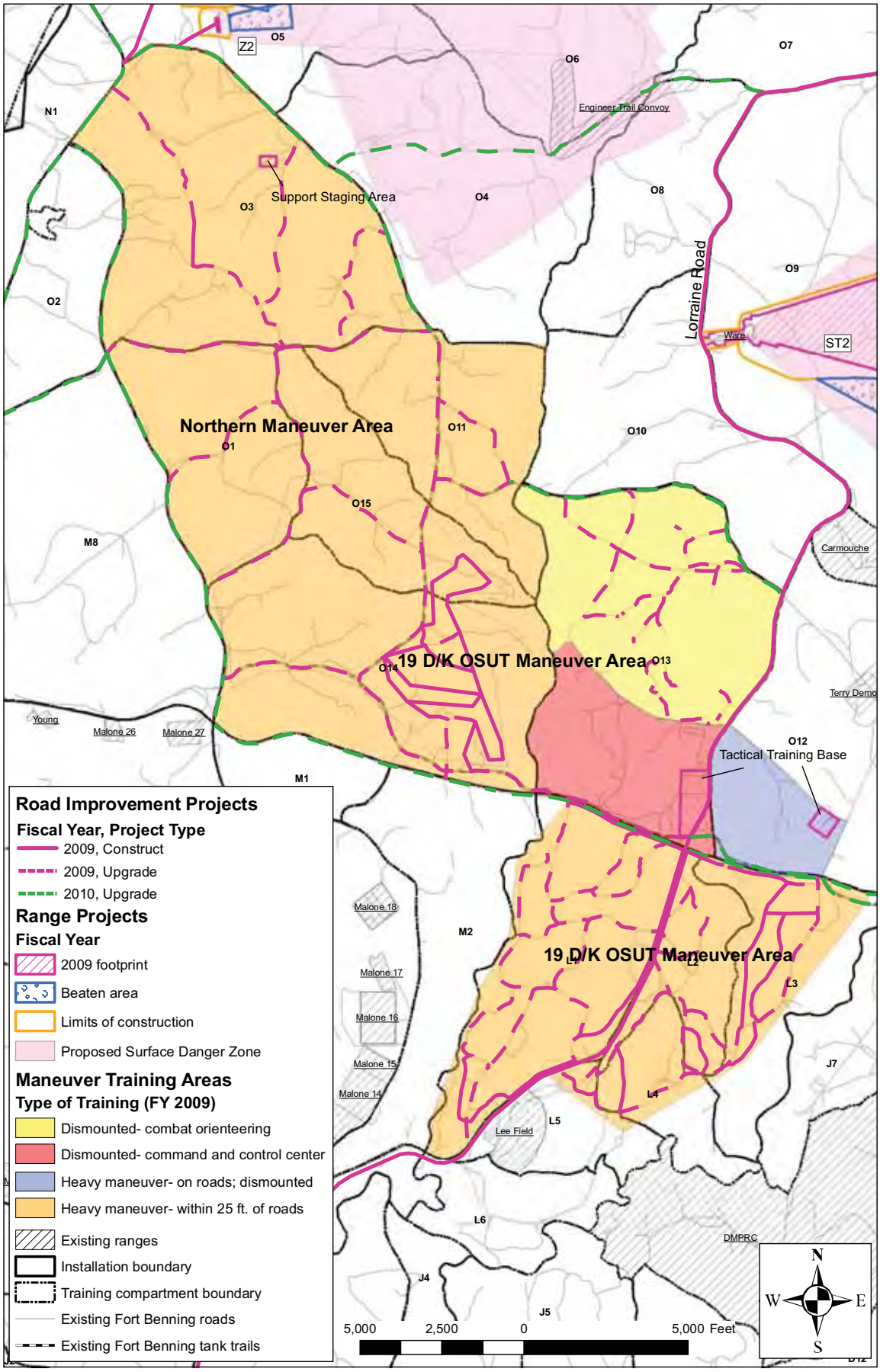


Figure 4-2. Fiscal years 2009-2010 construction activities and operational impacts for proposed projects located in the Northern Ranges for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

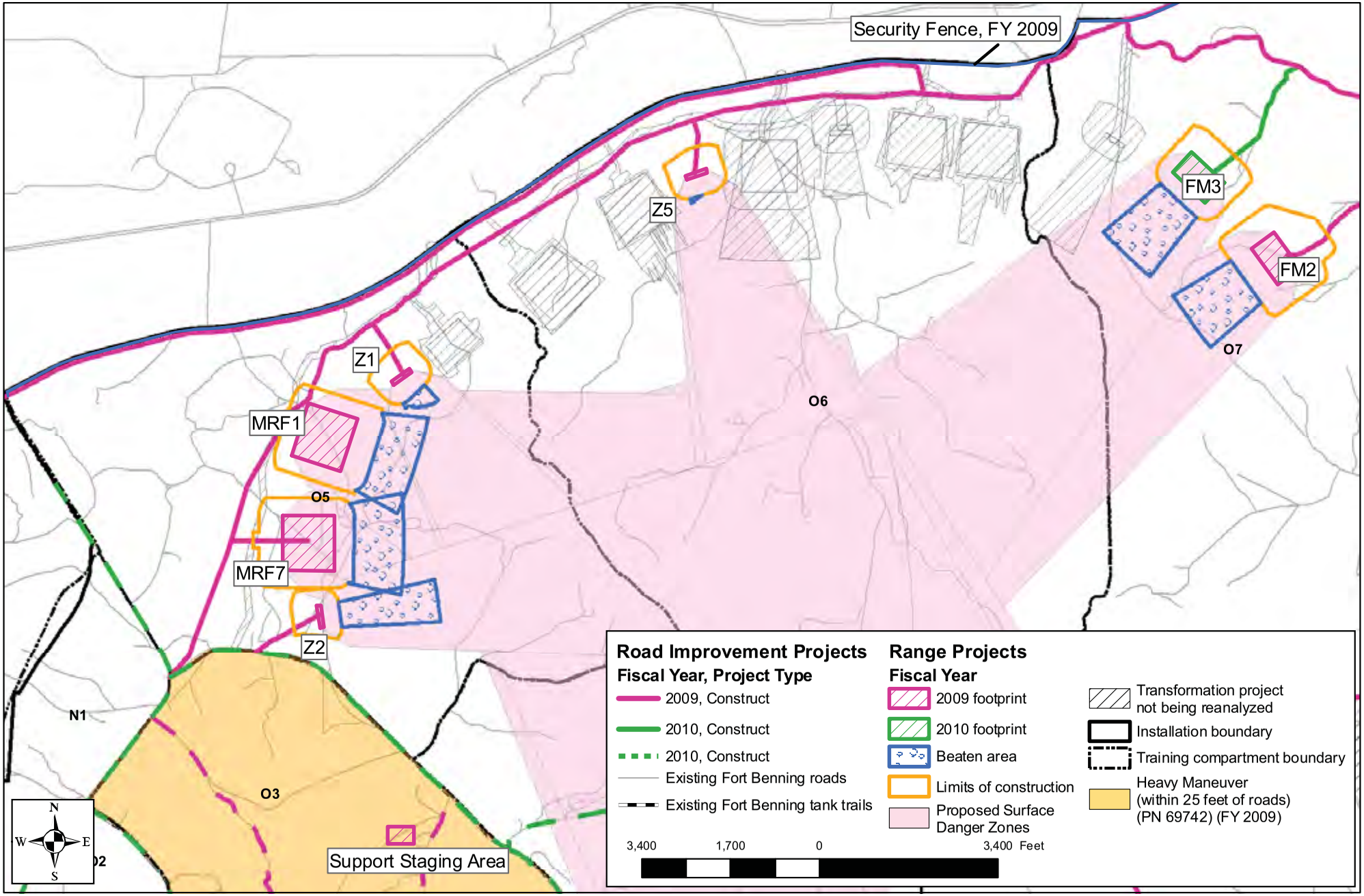


Figure 4-3. Fiscal years 2009-2010 construction activities and operational impacts for proposed projects located in the Oscar Small Arms Range Complex for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia. Also shown are the current locations of range projects analyzed in the Transformation Biological Assessment that are not being reanalyzed for this action.

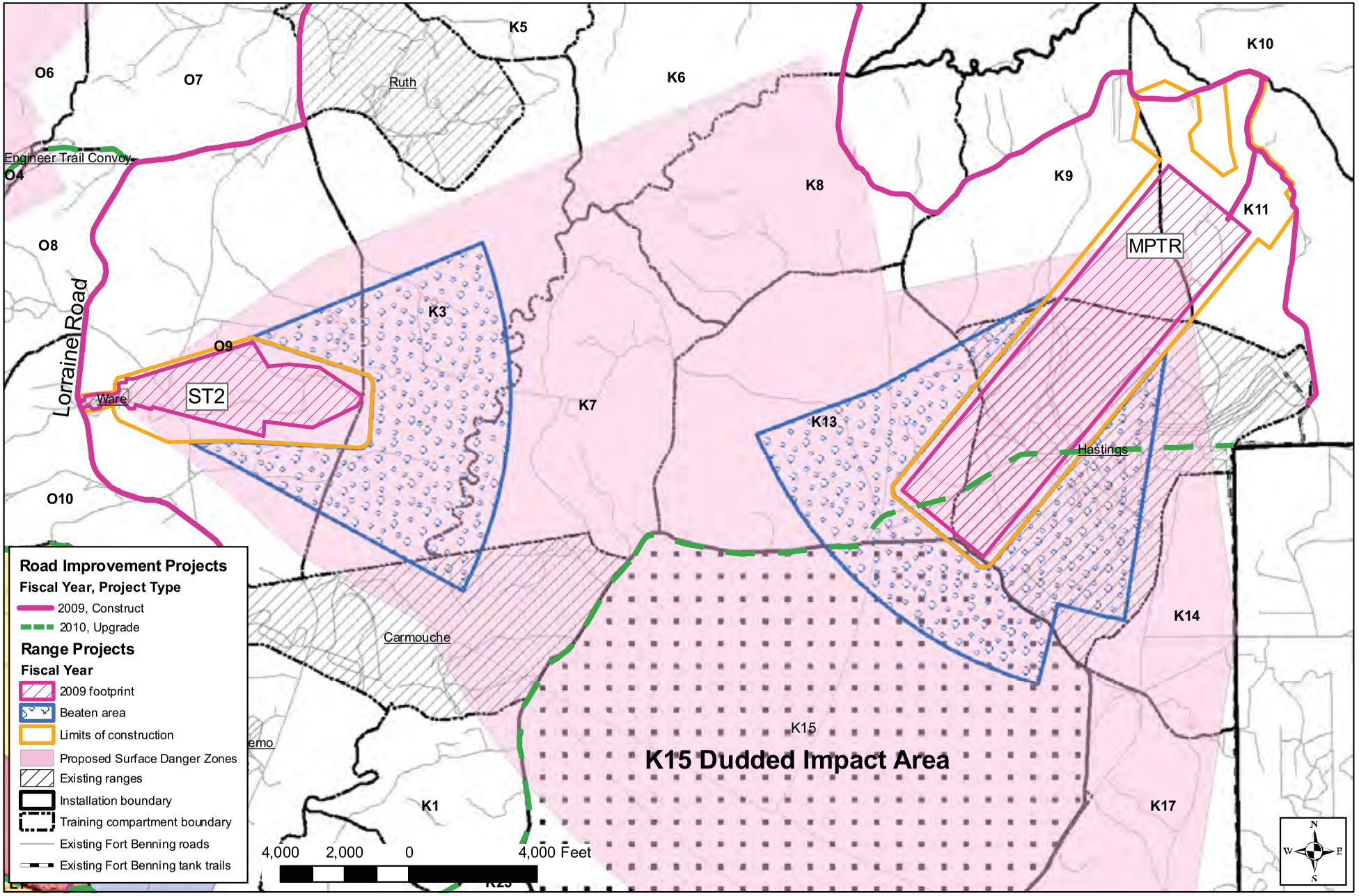


Figure 4-4. Fiscal year 2009-2010 construction activities and operational impacts for proposed projects located in the Northeastern Ranges for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

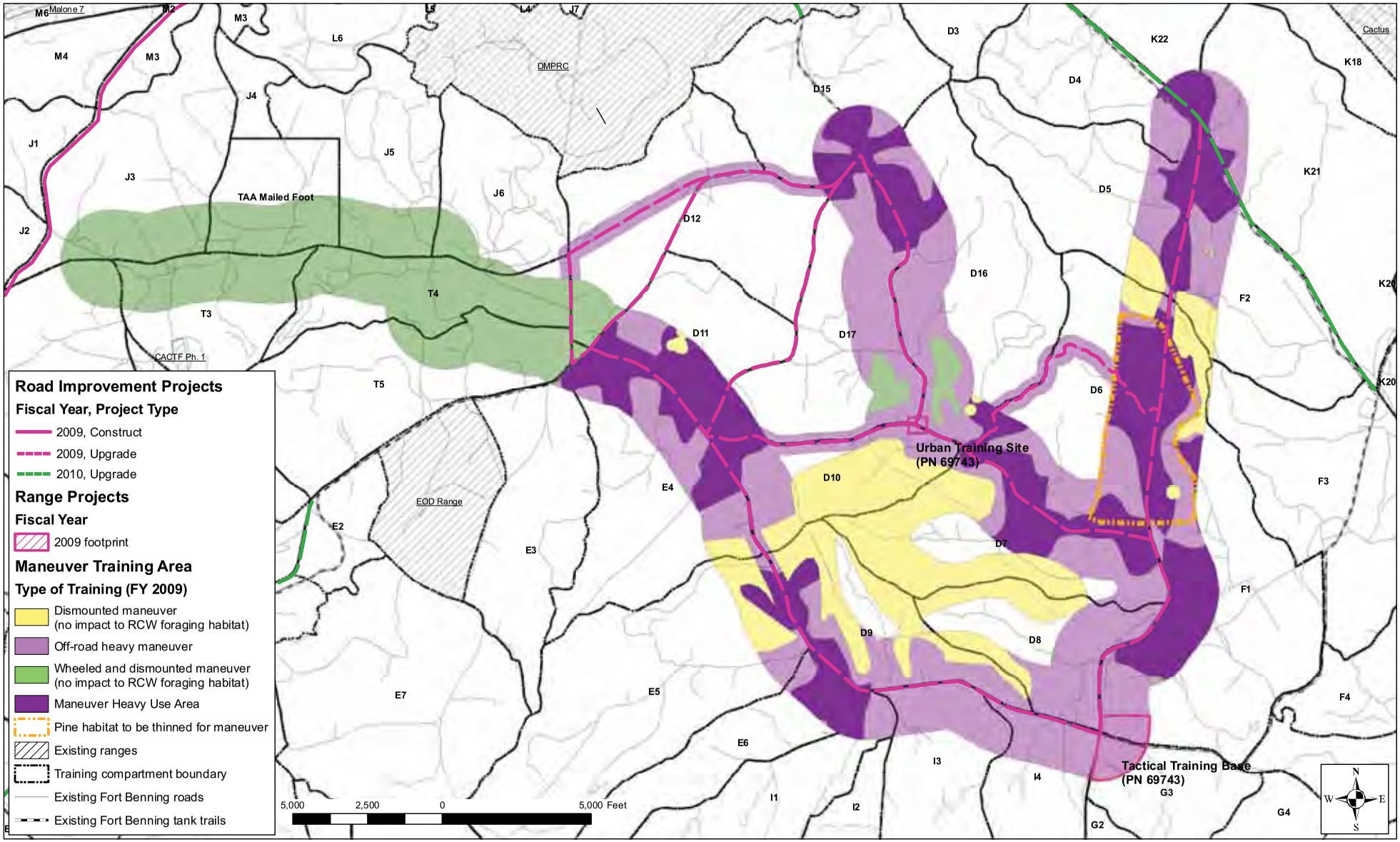


Figure 4-5. Fiscal years 2009-2010 construction activities and operational impacts for proposed projects located in the Southern Training Area for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

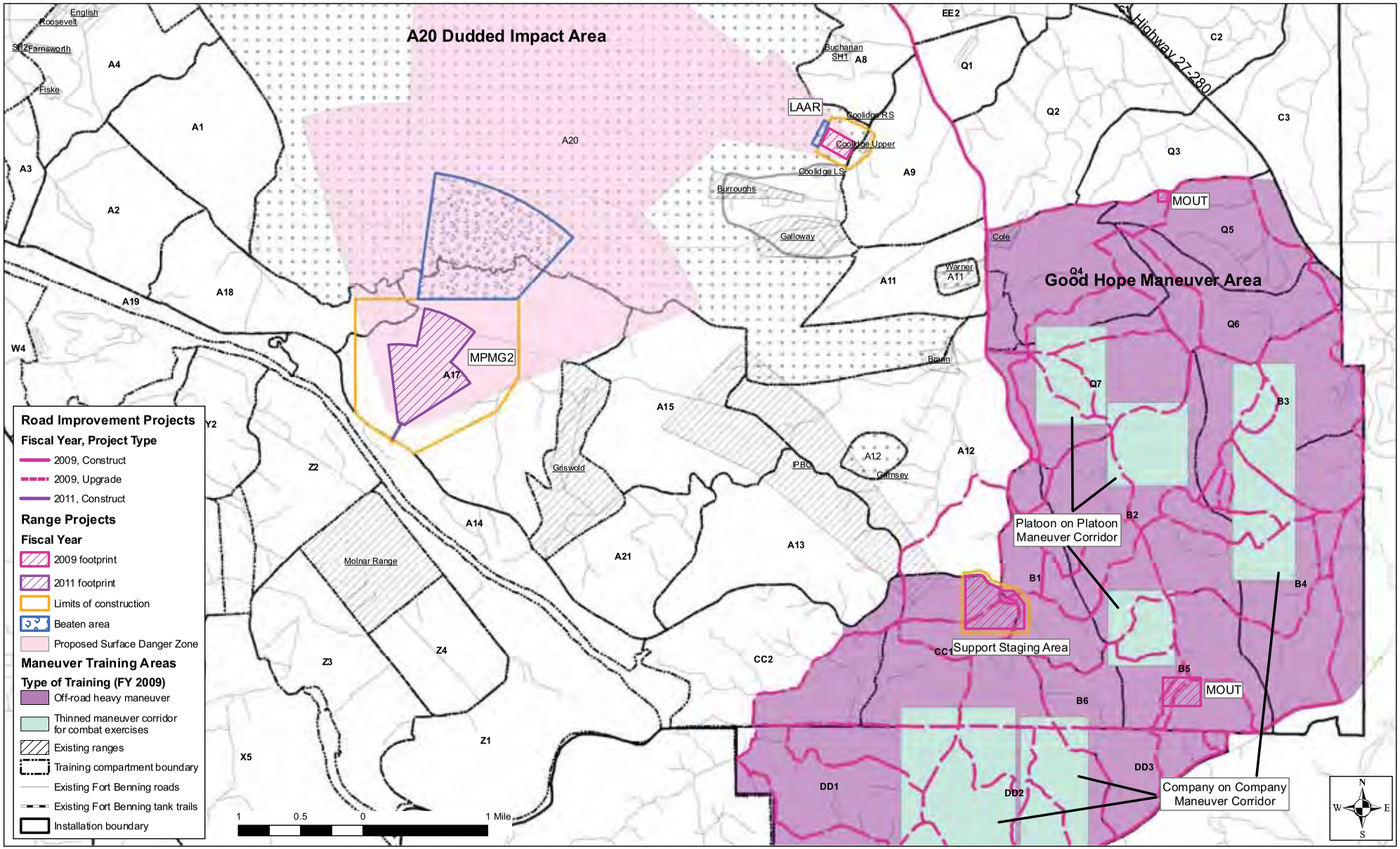


Figure 4-6. Fiscal years 2009-2011 construction activities and operational impacts for proposed projects located in the Southern Ranges for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

habitat (Table 4-1). The course will be used by the 194th Bde's Ground Mobility Division (GMD) to conduct the Tracked Vehicle Recovery Specialist training course (see Section 4.7). Students will be trained to tow and recover tracked vehicles using a M88 recovery vehicle in a variety of scenarios (including buried, stuck, nose-in and overturned) at 11 mire pits, 8 averaging 45 ft. by 65 ft. and 3 averaging 20 by 50 ft. Mire pits will be lined with concrete and will have 200 ft. concrete approaches to minimize time needed to rehabilitate these areas, maximizing the availability of training stations. Students will also be trained in electrical system troubleshooting, suspension troubleshooting and repair, and other mechanical skills at an additional 6 stations, all on permanent gravel pads. Roads needed for the Vehicle Recovery Course include a concrete perimeter road (approximately 4.5 miles) and internal crushed rock tank trails (approximately 3.5 miles) - these have been laid out in concept drawings, but have not been designed. An estimated 4 water crossings will be needed.

The Vehicle Recovery Course site contains some disturbed areas, but is mostly forested in young (<15 years old) longleaf plantations, pine stands 30-60 years old, pine stands over 60 years old and hardwood drainages. Fort Benning expects to be able to position stations in existing openings and require only limited timber harvesting for tank trails and mire sites. As described in Section 5.2 below, 100% of the habitat, including RCW cavity trees, was analyzed as cleared because of the uncertainty of where training stations and trails will be positioned. Once designed, however, all RCW trees should be retained.

A Recreation Center (PN 65246) (FY 2012) in Harmony Church previously analyzed at a 12-acre site between Jamestown Rd., Old Cusseta Hwy. and Eighth Division Rd. has been split into 3 Centers: 1 on an 18-acre site in Harmony Church on Axton Rd. and the other 2 on 7- and 1-acre sites in Sand Hill on Pine St. (Figure 4-1). The 7-acre site in Sand Hill and the facility in Harmony Church will collectively impact up to 3 acres of pine habitat. The 1-acre site in Sand Hill will not remove any pine habitat (Table 4-1).

A Physical Fitness Center with a swimming pool and athletic fields (PN 65248) (FY 2012) is programmed for FY 2011 to FY 2012 in Harmony Church, east of Hwy. 27-280 and north of Eighth Division Rd., in the same complex as other USAARMS facilities. This 34-acre site has shifted slightly and now encompasses 39 acres (Figure 4-1). A maximum of 1 acre of pine habitat will be impacted by this project (Table 4-1).

An expansion of the Rail Loading Facility (PN 62953) (FY 2012) will be built northeast of Harmony Church and south of the intersection of First Division Rd. and Ochillee Creek, known as Ochillee Junction (Figure 4-1). The limit of disturbance analyzed for this project has increased from 95 acres to 134 acres in order to include a connection to another track on the opposite side of Ochillee Creek. A maximum of 28 acres of pine habitat will be removed for this project (Table 4-1).

4.5.1.2. Main Post

A new Hospital (PN 70235 (2008)/ 65081 (2009)/ 67461 (2010) was analyzed in the Transformation Biological Assessment, west of the existing facility on a 164-acre site west of Lindsay Creek Pkwy., north of Marne Rd. and south of Custer Rd.. The limits of construction for this project have been shifted to the east in order to include the existing hospital, parking and some forested habitat. The total disturbed acreage has been reduced to 137 acres. A maximum of 3 acres of pine will be impacted, which are isolated from other pine habitat on the Installation and are not counted towards habitat that will be managed for the RCW (Table 4-1, Figure 4-1). Although funding for the first phase of this project was made available in FY 2008, construction will not begin until after the ROD for the proposed action is signed.

4.5.1.3. Sand Hill

As described in Section 4.5.1.1, a Recreation Center (PN 65246) (FY 2012) in Harmony Church previously analyzed at a 12-acre site between Jamestown Rd., Old Cusseta Hwy. and Eighth Division Rd. has been split into 3 Centers, 2 of which are in Sand Hill, on 7- and 1-acre sites on Pine St. (Figure 4-1). The 7-acre site in Sand Hill and the facility in Harmony Church will collectively impact up to 3 acres of pine habitat (Table 4-1). The 1-acre site in Sand Hill will not remove any pine habitat.

4.5.1.4. Oscar Complex

Three Rifle/ Machine Gun Zero (Z) Ranges, Z1, Z2 and Z5 (PNs 65035, 65036 and 65039), were evaluated in the Transformation BO (USFWS 2007a), but have changed substantially in size, location and build year. These 3 ranges will still be within the Oscar Complex, but are planned for FY 2009 instead of FY 2008 (Figure 4-3). Ranges are expected to

be operational in 2011. The range footprints were analyzed at 0.79 acre each and have not changed. The associated beaten and staging areas were 38, 49 and 50 acres, respectively. The construction limits are now approximately 18, 14 and 17 acres, respectively, and the associated beaten areas are 3, 28 and 0.2 acres, respectively (Z1 and Z5 have natural backstops, reducing the projected beaten areas) (Table 4-2). Access roads to these ranges will require clearing of up to 5, 6 and 5 acres, respectively. A total of 23, 28 and 19 acres of pine habitat will be impacted by Z1, Z2 and Z5, respectively (Table 4-1).

Primary facilities at each range will include 32 lanes with targets at 10 and 25 meters, a security barrier, range operations and control area, operations/ storage building, general instruction building, latrine, bleacher enclosure, covered mess and ammunition breakdown building. These ranges will be used to train and test individual Soldiers in USAARMS OSUT and BOLC III courses on the skills necessary to align sights and practice basic marksmanship techniques against stationary targets using M16 and M4 series rifles and crew-served machine guns.

Fire and Movement Range 3 (PN 65034) (FY 2010) has shifted east from its previous location. This range will be used for the USAARMS OSUT and is expected to be operational in 2011. A 20-acre footprint and 75-acre beaten area were originally analyzed for this project for Transformation. The new range footprint, limits of construction and beaten area are now 10, 33 and 36 acres, respectively. A 0.52-mile access road will require clearing of up to 11 acres and range construction and operation will result in the loss of up to 50 acres of pine (Tables 4-1 and 4-2, Figure 4-3).

4.5.1.5. Northeastern ranges

Stationary Tank Range 2 (ST2) (PN 65383) (FY 2009) was analyzed in the Transformation Biological Assessment at the existing Ware Range, west of and firing into the K15 Impact Area and south of baseline Transformation project ST1. The location and shape of this project have changed and it is now impacting a previously unimpacted RCW cluster. The footprint, limits of construction and beaten area now include 295, 193 and 1,188 acres, respectively. A maximum of 563 acres of pine habitat will be impacted. This range is expected to be operational in 2011. (Tables 4-1 and 4-2, Figure 4-4).

This range will be used for the USAARMS OSUT courses. The standard requirements are a company-sized unit firing M1A1s or M3A3s from 14 firing points at approximately 0.5 hour/ iterations.

4.5.1.6. Southern ranges

A Multi-Purpose Machine Gun Range (MPMG2) (PN 65070) (FY 2011) was assessed in the Transformation Biological Assessment in Compartments K3 and K4 at the site of the existing Ruth Range. Upon further analysis of current and projected training loads, however, it was determined that the loss of training at Ruth Range could not be mitigated at other ranges (F. Weekley, Fort Benning, pers. comm.). MPMG2 will now be located in Compartment A17, south of the A20 Dudded Impact Area (Figure 4-6) and is expected to be operational in 2012. This range was originally analyzed with a 238-acre range footprint and a 166-acre beaten area. The footprint analyzed herein will still be 238 acres, the limits of construction will be 620 acres and the beaten area will be 551 acres An access road will impact up to 4 additional acres. A maximum of 483 acres of pine habitat will be impacted (Tables 4-1 and 4-2 and Figure 4-6).

This BRAC-driven range will be used by 3rd ID/ 3rd Bde and the USAARMS to train and test individual Soldiers on the skills necessary to identify, engage and defeat stationary infantry targets for day/ night qualification requirements. It will contain stationary infantry and armor targets in 10 firing lanes. Targets will be at 3,280 ft. (1,000 m) and 4,920 ft. (1,500 m) for M60 and 0.50 caliber weapons, respectively.

4.5.2. NEW MCOE PROJECTS

4.5.2.1. Harmony Church

An AAFES Troop Store (PN 71065) (FY 2009) will be constructed in FY 2009 on a 6-acre site on Old Cusseta Hwy., most of which was included in areas previously analyzed for Transformation under different projects (Table 4-1, Figure 4-1). This project will not require removal of any pine habitat.

One component of the Infrastructure Support, Incr. 2 project (PN 67457) (FY 2009) is approximately 7.3 miles of direct buried communication cable throughout Harmony Church. This project will impact up to 85 acres, of which 33 acres are forested in pine habitat (Table 4-1,

Figure 4-1). The other component of this project is a security fence, described below under Section 4.5.2.4.

4.5.2.2. Main Post

Many of the proposed projects on Main Post are in historically developed areas. These projects are not discussed in detail because of the absence of Federally-listed Threatened and Endangered species or potential habitat in these areas, but can be found in Table 4-1 and Figure 4-1. Projects outside of the fully developed portion of Main Post and/ or that will require vegetation clearing are listed below.

Unit Maintenance Facilities (PN 69406) (FY 2009) will be constructed at 2 previously developed sites and on an 18-acre site south of Soldier's Plaza on Dixie Rd. One of the previously developed sites consists of 30 acres and the other is 2-acres. These projects will provide company headquarters, vehicle maintenance facilities, storage and fueling facilities for the Military Police units being restationed at Fort Benning as part of GDPR. Only the third site on Dixie Rd. will remove pine habitat, which will be a maximum of 2 acres in size (Table 4-1, Figure 4-1).

A Warrior in Transition Complex (PN 69999) (FY 2009) will be constructed on a 21-acre site on Ingersoll St., which is currently open lawn. No pine habitat will be impacted. This complex will provide facilities including barracks and a Soldier and Family Assistance Center to support the healing process of 2 companies of Warriors in Transition (wounded Soldiers) (Table 4-1, Figure 4-1).

A Water Treatment Plant Upgrade and Expansion (PN 71473) (FY 2010) is planned on Main Post. This project will include upgrades of the existing water treatment facility and the construction of a new water intake on the Chattahoochee River. New water lines will transport water up to 2.2 miles along Marne Rd. to the water treatment facility. Power will be upgraded at the existing water treatment facility. This project will impact up to 47 acres, none of which is forested in pine habitat (Table 4-1, Figure 4-1).

A Maneuver Battle Lab (PN 65250) (FY 2010) will be added onto Building 2878, Mabry Hall, on Dixie Rd. and Way St. Approximately two-thirds of the 27-acre site is developed and the remainder is forested in hardwoods. This facility will be used for the Maneuver Battle Lab

which will be formed when the Soldier Battle Lab at Fort Benning and the Mounted Maneuver Battle Lab at Fort Knox are combined. This construction is necessary to meet Infantry and Armor experimentation requirements, as well as for all BCT types (Heavy, Infantry and Stryker) and Armored Cavalry Regiment experimentation. Facilities will include simulators, access roads, parking, security fencing and gates (Table 4-1, Figure 4-1). This project will not require removal of any pine habitat.

A Dental Clinic (PN 71620) (FY 2010) will be constructed on Main Post as an expansion to the existing Bernheim Clinic on a 10-acre site west of the Maneuver Battle Lab on the corner of Sightseeing Rd. and Way St. (Table 4-1, Figure 4-1). This project will not require the removal of any pine habitat.

A Dining Facility to Support AST Training (PN 69151) (FY 2011) is planned for a 10-acre site between Indianhead Rd. and Riordan St. This site is currently developed and will not require any vegetation clearing.

4.5.2.3. Sand Hill

A Trainee Complex Upgrade (PN 69147) (PN 2009) will improve 2 existing facilities on 2nd Armored Division and Moye Rds. on an 81-acre site. An existing dining facility and running track will be converted to classroom space and a new dining facility and a new running track will be constructed (Table 4-1, Figure 4-1). This project will impact up to 4 acres of pine habitat.

A Classroom and Dual Battalion Dining Facility (PN 69150) (FY 2010) will be constructed between 2 existing barracks complexes between Pine St. and 11th Airborne Division Rd. This project will impact up to 66 acres, 1 of which is pine-dominated habitat (Table 4-1, Figure 4-1).

A Training Barracks Complex (PN 69745) (FY 2012) project will include construction on 2 sites in Sand Hill: a 7-acre site on 11th Airborne Division Rd. and a 2-acre site north of Bushnell Rd (Table 4-1, Figure 4-1). Construction on the 7-acre site will impact up to 4 acres of pine habitat (Table 4-1). The site located north of Bushnell Rd. will not remove any pine habitat.

Classrooms with Battalion Dining Facilities, Phases 1 and 2 (PN 70027/ 72457) (FY 2010) will be constructed at 2 sites, both of which are partially developed. One site will be between 11th Airborne Division and Cusseta Rds. on a 43-acre site and will not remove any pine

habitat. The other will be on Pine St. on a 29-acre site (Table 4-1, Figure 4-1). This project will impact up to 4 acres of pine habitat.

Classrooms with Battalion Dining Facilities, Phases 1 and 2 (PN 70026/ 72456) (FY 2010) will be constructed at 2 sites on 11th Airborne Division Rd., both of which are developed (Table 4-1, Figure 4-1). One is a 23-acre site, and the other consists of 27 acres. No Federally-listed species habitat will be impacted by this project.

A Training Barracks Complex (PN 72322/ 72324) (FY 2010) will be constructed on a 115-acre site on Moye Rd. in Sand Hill. This project will impact up to 68 acres of pine habitat (Table 4-1, Figure 4-1).

4.5.2.4. Oscar Complex

Fire and Movement (FM) Range 2 (PN 65033) (FY 2009) is planned for the Oscar Complex in Compartment O7. This small arms range will include a range operations center, operations/ storage building, bleacher enclosure, ammunition breakdown building and latrine. It will be used by the USAARMS OSUT to train and test Soldiers on basic fire and movement techniques against stationary infantry targets. The range footprint will be approximately 10 acres, with limits of construction of 52 acres and a beaten area of approximately 33 acres. A 0.8-mile access road will impact up to 20 acres (Table 4-1, Figure 4-3). This project will impact up to 89 acres of pine habitat (Table 4-1).

Two MRF ranges (MRF1 and MRF7) (PNs 65043 and 65049) (FY 2009) are programmed for the Oscar Complex. Primary facilities at each range will include a general instruction building, ammunition breakdown building, bleacher enclosure, operations/ storage building, latrine, covered mess and building information systems. These ranges will have 24-acre footprints and 16 lanes each. Beaten areas will cover 33 and 38 acres, respectively, and the construction limits will be 47 and 44 acres, respectively (Table 4-1, Figure 4-3). A 0.29-mile road to MRF7 will impact up to 5 acres. Construction of the MRF1 and MRF7 ranges will impact up to 59 and 80 acres of pine habitat, respectively (Table 4-1).

The Infrastructure Support, Incr. 2 (PN 67457) (FY 2009) includes a security fence along the northern boundary of the Installation beginning on 10th Armored Division Rd. and following along Chattsworth Rd. and a railroad for approximately 6 miles. The fence will have a right-of-way of approximately 40 ft. and will impact up to 30 acres (Table 4-1, Figure 4-3). This project

will impact the Randall Creek North relict trillium population (See Section 6.1) and up to 20 acres of pine habitat.

4.5.2.5. Northeastern ranges

A Multi-Purpose Training Range (MPTR) (PN 64551) (FY 2009) is proposed for construction in Compartments K9, K11 and K13, to the north of, and overlapping, Hastings range. This range will be used by the USAIS and USAARMS to train and test crews and dismounted infantry squads on the skills necessary to detect, identify, engage and defeat stationary infantry and stationary/moving armor targets in a tactical array. In addition to live-fire, this range can be used for training with sub-caliber and/or laser training devices and is specifically designed to satisfy the training and qualification requirements for the crews and sections of armor and infantry units. It will also support dismounted infantry squad tactical live-fire operations either independently of, or simultaneously with, supporting vehicles (USACE 2008). Its footprint will be approximately 984 acres and the limits of construction and beaten area will be 468 and 1,383 acres, respectively (Table 4-1, Figure 4-4). A 0.44-mile access road will remove up to 9 acres. This project will impact up to 876 acres of pine habitat (Table 4-1).

4.5.2.6. Southern ranges

An Anti-Armor Tracking and Live Fire Complex (LA-AR1) (PN 65078) (FY 2009) is planned for construction adjacent to the existing Coolidge-Upper Range. This range will be used to train and test Soldiers on the skills necessary to employ anti-armor missile systems and to identify, track, engage and defeat stationary and moving targets. It is designed to meet training and qualification requirements of medium and heavy anti-armor weapon systems. The footprint for the LA-AR1 will be 23 acres and the limits of construction and beaten areas will impact an additional 57 and 7 acres, respectively. The majority of this range and its limits of construction are in the A20 Dudded Impact Area (Table 4-1, Figure 4-6). This project will impact up to 43 acres of pine habitat (Table 4-1).

4.6. TRAINING AREA ROADS

The limits of disturbance for all 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. Once roads or trails are established, it is expected that the average width will be 30 ft. including berms, and will support the variety of wheeled and tracked vehicles (M1A1 Tanks to HMMWVs) used for USAARMS training.

Note: Roads within Maneuver Areas (defined in Section 2.2.2.1) are included with the corresponding Maneuver Area and range access roads are included with the corresponding range descriptions.

An estimated 141 water crossings will be established along existing and proposed tank trails throughout the Installation. These water crossings were also analyzed at 96 ft. from the center point, but will be approximately 30 ft. wide when constructed. Gravel and cable concrete will be used to ensure access road and streambank stability. These crossings will be funded by the associated infrastructure or range project and are discussed in the corresponding project descriptions.

4.6.1. REANALYZED TRANSFORMATION ROAD PROJECTS

For the Transformation Biological Assessment, a disturbance limit of 60 ft. from the centerline was used for new training roads and trails, and 40 ft. from centerline was used for upgrades and repairs of existing roads and trails. These widths were thought to be sufficient to account for grading, berms and erosion control measures, however, for the MCOE Biological Assessment this buffer was increased to 96 ft. from centerline as described above. All roads and trails analyzed in the Transformation Biological Assessment were assigned either PN 65554 or PN 65557, however, 1 section of trail will now have separate funding: the Good Hope Access Road (PN 69358) (FY 2009). This project includes approximately 6.9 miles of new construction, totaling 162 acres, and will require approximately 4 water crossings (Tables 4-1 and 4-2, Figure 4-6). This project will impact up to 100 acres of pine habitat (Table 4-1).

The Construct Training Area Roads project (PN 65554) (FY 2009) includes roads and trails throughout the Installation, outside of the Maneuver Areas. Approximately 38.3 miles of roads and trails will be constructed for this project, disturbing approximately 890 acres (Tables 4-1 and 4-2, Figures 4-1 through 4-6). An estimated 33 water crossings will be required. This project will impact up to 580 acres of pine habitat (Table 4-1).

The Repair Existing Training Area Roads project (PN 65557) (FY 2010) consists of road and trail upgrades totaling approximately 53.15 miles throughout the Installation, but outside the Maneuver Areas. This will disturb up to 1,194 acres (Tables 4-1 and 4-2, Figures 4-1 through 4-6). This project will impact up to 721 acres of pine habitat (Table 4-1).

An access road to the Tracked Vehicle Drivers Course (PN 64797) is scheduled for 2009. This project includes approximately 0.6 mile of new road construction and 0.3 mile of road upgrades. This project will disturb up to 18 acres and will require the removal of up to 9 acres of pine habitat (Tables 4-1 and 4-2, Figure 4-1).

4.7. MANEUVER TRAINING

4.7.1. INCREASED MANEUVER LAND USE

As described in Section 2.1.4, using the POI requirements presented in the RDP for the 3rd Bde and the USAARMS, heavy maneuver training requirements on Fort Benning would increase from 70,568 km^2 days to 175,993 km^2 days upon implementation of Transformation actions: a 149% increase (USACE 2006a). Due to personnel increases described below in Section 4.7.2, however, an additional 4,978 km^2 days are now needed for one USAARMS training course, bringing the total heavy maneuver requirement up to 180,971, a 156% net increase with Transformation and MCOE.

4.7.2. TRAINING COURSES

Training units of the USAARMS relocating to Fort Benning include the 194th Armored Bde, the 16th Cavalry Regt and the Army NCOA (Noncommissioned Officer Academy) (Table 2-1). Together, these units are responsible for training every Armor Crewman in the Army and Marines. More than 70 training courses currently conducted at Fort Knox, ranging in length from 1 to 20 weeks, will be shifted to Fort Benning as part of Transformation (USACE 2007b).

Selected training courses anticipated to take place in the Maneuver Areas are discussed below and are listed in Table 4-3.

The 194th Armored Bde's 19D One Station Unit Training (OSUT) Cavalry Scout (19D OSUT) course trains initial entry Cavalry Scouts in small arms; BFV, HMMWV and Stryker mechanics; use of simulators; gunnery; dismounted combat orienteering; mounted and dismounted urban operations; driver training and includes a field training exercise (FTX). Ten

Table 4-3. Selected USAARMS training courses relocating to Fort Benning.

Course	Scope	Duration (Days)	Number of Classes/ Year	Total Days/ Year	Vehicle types	Number of Vehicles by Type	Number of personnel (Students, Other)	Percent of Training Conducted at Night	Primary Training Location on Fort Benning
194th Armor Brigade (formerly 1st ATB)									
19 D OSUT Cavalry Scout	Basic combat training tasks; Army values; physical fitness; first aid; nuclear, biological and chemical threats; engineer; communications; land navigation; weapons; individual tactical training; intelligence; M3 Bradley, Stryker and HMMWV operation and maintenance	10	23	230	Tracked and wheeled (including Strykers)	40 M2 BFVs, HMMWVs, and Stryker Reconnaissance Vehicles		40	19D/K OSUT Maneuver Area, Drivers Training Course, & live fire ranges
19 K OSUT A1A Abrams Armor Crewman	Basic combat training tasks; Army values; physical fitness; first aid; nuclear, biological and chemical threats; engineer; communications; land navigation; weapons; individual tactical training; M1A series tank and M1025 series HMMWV operation and maintenance	9	13	117	Tracked and wheeled (including Strykers)	55 M1A1 Tanks, HMMWVs, and Stryker Mobile Gun Systems		33	19D/K OSUT Maneuver Area, Drivers Training Course, & live fire ranges
63A10 AIT M1A1 Abrams Tank System Maintainer	Test and troubleshoot systems; inspect, service, lubricate, replace and adjust components; use of publications, special tools, test measurement and diagnostic equipment; fundamentals and principles of engine, fuel, exhaust, cooling, and electrical systems; track, suspension, steering control, hydraulic systems, engine power train and hull of the M1A1 Abrams tank, perform preventive maintenance checks and services; inspect, service, lubricate, replace, remove, install, adjust, test, purge, and troubleshoot components and control of electrical, mechanical, fire control components on the M1A1 tank turret.	8	17	136	Tracked	10- Live 12- Training aids	24, 12	25	Vehicle Recovery Course
63M10 AIT M2/M3 BFV System Maintainer	Same as above, but for the M2/M3 BFV.	8	21	168	Tracked	14- Live 12-Training Aids	40, 24	25	Vehicle Recovery Course
ASI H8 Tracked Vehicle Recovery Specialist	Test and troubleshoot systems; inspect, service, lubricate, replace and adjust components; starting, charging, auxiliary power units, brakes, and main winch systems; operating, servicing and using track recovery vehicles and equipment; procedures used in rigging, recovering and towing of track vehicles.	21	16	336	Tracked	4- Live 20-Training Aids	12, 6	N/A	Vehicle Recovery Course
U.S. Marine Corps	Similar training to the 19 K OSUT, A1A Abrams Armor Crewman, and 63A10 OSUT, M1A1 Abrams Tank System Maintainer, but for the Marine Corps.	15	9	135	Tracked	4 M88, 2 Mine Plows	18,10	NA	Vehicle Recovery Course

Table 4-3 (cont.). Selected USAARMS training courses relocating to Fort Benning.

Course	Scope	Duration (Days) Current	Number of Classes/ Year-Current	Total Days/ Year-Current	Vehicle types	Number of Vehicles by Type-Current	Number of personnel (Students, Other)	Percent of Training Conducted at Night-Trans	Primary Training Location on Fort Benning
16th Cavalry Regiment									
Basic Officer Leader Course (BOLC) III	Indoctrination of Army programs and initiatives; military problem solving; risk management; after action review; suicide prevention; combat stress; 9mm pistol qualification; and a two-day field exercise designed to validate pre-commissioning skills. Hands-on equipment oriented instruction is used to train preventive maintenance, checks and services and the M1A1 tanks, tank crew station tasks, and pre-gunnery skills culminating with the tank crew gunnery skills test; property accountability; platoon maintenance operations; and individual and crew nuclear, biological, and chemical operations. Fundamentals of platoon offensive and defensive operations and FTX including force-on-force, free-play, offensive/defensive exercise with opposing forces, conduct troop leading procedures; pre-deployment and deployment operations; and Post-exercise inspections. Also includes tank gunnery, completion training, and cavalry enhancement training.	23	11	253	Tracked Wheeled	23 40	92, 84	50	Good Hope Maneuver Area
2E-F137/521-F2 Army Reconaissance Course (formerly the Scout Leaders Course)	Identify and operate within the contemporary operating environment, applying the skills, knowledge and capabilities necessary to ascertain and communicate the nature of the threat with respect to the operating environment to ensure mission success. Involves constructive, virtual, live and computer based training. Includes intelligence preparation of the battlefield and practical exercises to plan and conduct advance reconnaissance and security missions on linear and nonlinear modern day battlefields. Tactical and technical proficiency in all aspects of mounted and dismounted reconnaissance and security operations.	10	11	110	Tracked Wheeled	13 48 (inc. 8 Strykers)	120-160, 95	35	Southern Maneuver Area
Noncommissioned Officer Academy (NCOA)									
19D BNCOC Cavalry Scout	In a combat simulated cavalry scout platoon environment: mine warfare; secure communications; tactical movements; demolitions; nuclear, biological, chemical threats; maintenance; safety; troop leading procedures; physical fitness training; training management; tactics; conduct of fire training; BFV gunnery; Field FTX; Common Leader Training ; Common Military Training; and tactical seminars in a 24-hour a day NCOA environment.	3	12	36	Tracked Wheeled	12 12		20	Southern Maneuver Area; alternate location is Good Hope
19K BNCOC Armor Crewman	In a combat-simulated tactical environment: armor tactics; secure communications; maintenance; tank gunnery; mine warfare; tank weapons; tank crew gunnery skills test; safety; troop leading procedures; physical fitness training; conduct of fire trainer; STX; and tactical seminars in a 24-hour a day NCOA environment.	3	12	36	Tracked Wheeled	24 0		20	Good Hope; alternate location is Southern Maneuver Area

days of training will be in the field and the course will be conducted 23 times per year. Cavalry Scouts are trained to operate BFVs, HMMWVs and Strykers at the basic and advanced drivers training courses (described in Section 3.3.2.2) and also conduct live fire training at small arms and stationary gunnery ranges; the remainder of the FTX will be conducted within the 19D/K OSUT Maneuver Area (See Section 4.7.4). Approximately 40 vehicles, including BFVs, HMMWVs and Strykers, are used during this course, but students rotate between the ranges and driver training course. Up to 14 vehicles are typically present in any given area.

The 194th Armored Bde also conducts the 19K OSUT Armor Crewman (19K OSUT) course, which trains Armor Crewmen in the same aspects as above with M1A1 Abrams tanks, HMMWVs and Strykers. This course involves approximately 55 of the above-listed vehicles. The field training for this course lasts 9 days and is conducted 13 times a year. As with the 19D OSUT, the vehicles are dispersed between the ranges and the Driver Training Course and generally stay in single-file lines and/ or small formations. Armor crewmen will be trained to operate M1A1 Abrams, HMMWVs and Strykers at the basic and advanced drivers training courses (described in Section 3.3.2.2) and also conduct live fire training at small arms and stationary gunnery ranges; the remainder of the FTX will be conducted within the 19D/K OSUT Maneuver Area (See Section 4.7.4).

The NCOA is responsible for conducting both the 19D Basic Noncommissioned Officer Course (BNCOC) Cavalry Scout (19D BNCOC) and the 19K BNCOC Armor Crewman (19K BNCOC) courses. These are similar to the 19D and K OSUT courses described above and each include 3-day FTXs conducted 12 times a year. This frequency has increased from the 5

times a year that was analyzed in the Transformation Biological Assessment (USACE 2007b) (Table 4-3).

The 16th Cavalry Regt's Scout Leaders Course currently being taught at the USAARMS is being revised to become the Army Reconnaissance Course (ARC). This course is designed to train and educate platoon leaders, platoon sergeants and section sergeants to effectively lead a reconnaissance platoon. This will be a 10-day course conducted 11 times a year, which is a significant increase in length from that analyzed in the Transformation Biological Assessment (4-day course, 11 times a year) (USACE 2007b). Student loads in this course have roughly tripled to 120-160 students/class (C. Stoinoff, USAARMS, pers. comm.) since the Transformation BO (USFWS 2007a) in order to support AMF and GTA initiatives. Instead of

being strictly a USAARMS course, it will now be available to all students with a reconnaissance mission. This course will initially be taught at Fort Knox, however, the increased student loads assessed in this document will not be funded until 2011, when the USAARMS will be at Fort Benning (C. Stoinoff, USAARMS, pers. comm.). Some of the student load of the Reconnaissance and Surveillance Leaders Course (RSLC), currently taught at Fort Benning by the 4th Ranger Training Bde., will transfer to the ARC, therefore training loads of the RSLC will be reduced.

The ARC will be conducted in the Southern Maneuver Area in both alternatives. This course includes a 3 day situational training exercise (STX) where students will be trained in unmanned aerial vehicle (UAV) operations, land navigation and reconnaissance mission preparation. During a 7-day FTX, 3 teams each comprised of 30 students and 10-18 trainers, will act as an IBCT, Heavy Brigade Combat Team (HBCT) and a Stryker Brigade Combat Team (SBCT). Each iteration of the FTX will evaluate 120-160 students. During the FTXs, there will be approximately 185 personnel (including 120-160 students), 13 tracked vehicles, 8 Strykers and 38 other wheeled vehicles spread throughout the Southern Maneuver Area.

The largest-scale FTXs at USAARMS will be during the Basic Officer Leader Course (BOLC) III, which will involve approximately 4 BFVs, 16 M1A1 tanks and 33 HMMWVs. This course includes 8-day FTXs which will occur 11 times per year. Exercises during the FTXs will typically involve 4 tank platoons and 3 reconnaissance platoons and will train Soldiers in conducting full-on attacks, defense, convoy escorts, route clearance, various reconnaissance missions, quick reaction force, dismounted infiltration, and urban reconnaissance and raids. During the FTX, co-use of the area by other units and/ or civilian personnel is possible, but limited (M. Gillette, USAARMS, pers. comm.). The BOLC III also includes 2 - 4 day STXs conducted 11 times per year. The total of all time spent in the field per course will be 23 days (Table 4-3).

As part of their ongoing effort to maximize resources and efficiency, as well as minimize environmental impacts, the Army is also developing an initiative termed “Ground School XXI.” This program establishes training strategies that employ combinations of live, virtual and constructive simulations in order to train future Soldiers, leaders, commanders and staff in conducting operations. The desired end state for this initiative is, through simulation, to provide

the MCOE and the Army with the capability to train and rehearse operations across the full spectrum of conflict for both mounted and dismounted operations (Fort Benning 2008a).

The remaining courses range in extent and duration and are listed in Table 4-3.

Many USAARMS courses are being revised prior to the relocation. The Armor Crewman/ Scout Advanced NCO Course (ANCOC) is combining with the Infantry ANCOC to form the Maneuver ANCOC. The Armor Captains Career Course and the Infantry Captains Career Course are combining to form the Maneuver Captains Career Course. Both of these new courses will be taught by a mixture of Infantry and Armor Soldiers and Officers and will include a mixed student population from both branches. These courses will train graduates in the skills common to mounted and dismounted Soldiers and leaders, as well as the unique skills specific to their military occupational specialty and unit of assignment. Both courses will occur at both Fort Benning and Fort Knox until Fort Benning has the training facilities, ranges, classrooms and billets to accommodate the combined training.

4.7.3. MANEUVER TRAINING AREA DESIGNATIONS

In implementing the proposed action, there will be a substantial and quantitative increase in heavy maneuver training which will result in impacts to Federally-listed Threatened and Endangered species and their habitats.

Heavy maneuver land. Fort Benning has approximately 84,925 acres of designated heavy maneuver training area (as described in Section 2.2) including the addition of the Good Hope Maneuver Area evaluated in the Transformation BO and ROD (USFWS 2007a; USACE 2007a) and excluding restricted areas. For clarification, this total area is **referred to in this document as 'heavy maneuver land.'** Once both existing and approved future Transformation range SDZs (post-Transformation) are subtracted, approximately 64,560 acres remain for heavy maneuver training (Figure 2-2).

Some loss of foraging habitat may occur in the areas designated as heavy maneuver land in addition to that assessed in this document, however, Fort Benning does not expect these losses to bring clusters below the Standard for Managed Stability (SMS) foraging standards (described in Section 5.3.3) (USFWS 2003a), nor does it request Incidental Take for these clusters at this time. In addition, habitat impacts are not expected to prevent clusters from ultimately meeting the Recovery Standard (USFWS 2003a). All current and proposed maneuver training exercises

will continue to require environmental review via submittal of a FB Form 144R and approval by EMD. Upon review, if EMD personnel determine that the exercise will result in adverse environmental impacts not addressed, or exceeding those addressed, in this document, and/or that the exercise will violate applicable Army RCW Guidelines (DA 1996, 2007), the training plan will either be disapproved or approved with conditions. The training will be modified to meet final restrictions or will not be conducted (F. Weekley, Range Division, pers. comm.).

The areas currently designated as heavy maneuver lands ("heavy maneuver land- current" on Figure 4-7) will not change under the proposed MCOE action.

Maneuver Areas. Fort Benning has designated 4 smaller areas and/or corridors within the heavy maneuver land for the most frequent, concentrated or intense off-road use by the USAARMS, **collectively referred to in this document as "Maneuver Areas.**" Accordingly, these will be the areas that experience substantial impacts to the existing flora and fauna and will require the greatest amount of sustainability resourcing and impact mitigation. While these sites will be the primary areas for off-road heavy maneuver training, other types of training will also occur. The types of training to occur in each Maneuver Area are depicted in Figures 4-2, 4-5 and 4-6.

Heavy maneuver training within the Maneuver Areas, but outside of the maneuver heavy use areas (described below), will stay ≥50 ft. from all RCW cavity trees and otherwise adhere to the applicable Army RCW Guidelines (DA 1996, 2007), therefore no impacts to cavity trees are expected. Off-road heavy maneuver acreages presented in this document do not include the 50-ft. buffer around each cavity tree.

Maneuver heavy use areas. To further identify and quantify the off-road heavy maneuver impacts within the Southern and Good Hope Maneuver Areas in preparation for the Transformation Biological Assessment, planning charrettes were held with representatives from the USAARMS and Fort Benning. Personnel utilized GIS to evaluate topographical data such as terrain, existing vegetation, environmental attributes (including location of RCW cavity trees) and current training use patterns in order to further delineate the areas within the corridors likely to sustain the heaviest impacts, **referred to in this document as the "maneuver heavy use areas"** (USACE 2007b). The expected frequent activity in these areas will likely result in tree root damage. This impact, coupled with forest decline syndrome, is likely to lead to the loss of 100% of RCW habitat over time in the maneuver heavy use areas. Because of the expected

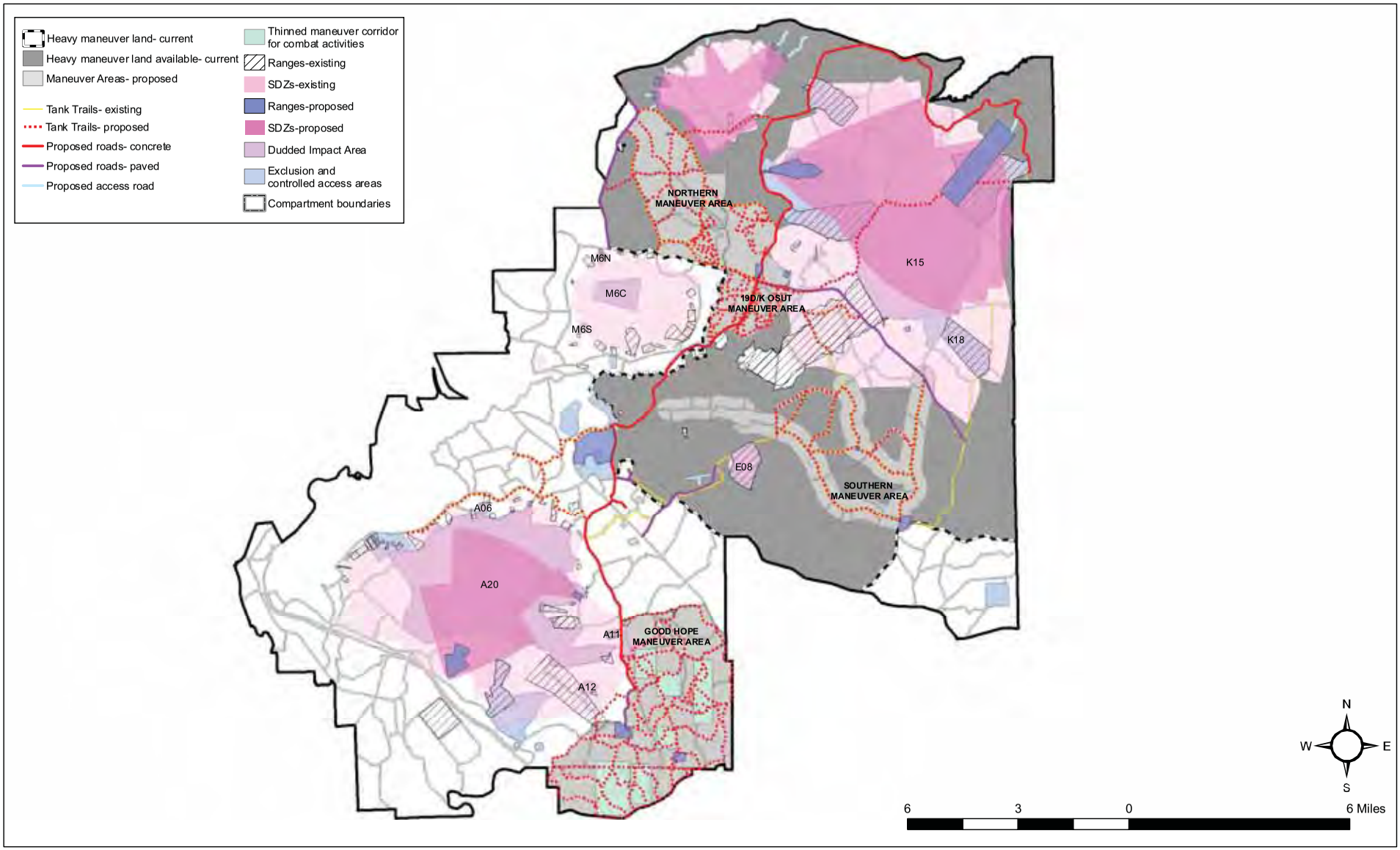


Figure 4-7. Current and proposed Heavy Maneuver Area use, excluding surface danger zones (SDZs), impact areas and other exclusion areas as designated by Range Division, Alternative A (Preferred Alternative) for the Maneuver Center of Excellence, Fort Benning.

frequency of activity in the maneuver heavy use areas, it is likely that even strict adherence to the Army RCW Guidelines listed in Table 2-5 (DA 1996, 2007) would still result in damage to RCW cavity trees and the loss of the cluster area. The Guidelines were written to apply to the types and frequencies of maneuver training currently being conducted at Army installations containing RCWs, which is generally much less intense than the training proposed for the MCOE. In a study on which the cluster restrictions in the Guidelines were based, the risk of exposure to maneuver training activities was relatively low for the majority of RCW clusters studied (Hayden 2002). In the small sample of clusters that did experience "high military activity," reproductive success was significantly lower. For this reason, tracked vehicles will stay 200 ft. away from all cavity trees unless on established roads and trails in all clusters except in 1 cluster within the maneuver heavy use areas (C. Stoinoff, USAARMS, pers. com.). Although other activities are prohibited within 200 ft. of cavity trees in the Army RCW Guidelines, heavy maneuver traffic is typically allowed up to 50 ft. (Table 2-5). Off-road heavy maneuver acreages presented in this document therefore do not include a 200-ft. buffer around each cavity tree within the maneuver heavy use areas, with the exception of the 1 cluster that could not be avoided.

4.7.4. PROPOSED MANEUVER AREAS AND ASSOCIATED INFRASTRUCTURE

For the preferred alternative of the Transformation Biological Assessment, Fort Benning designated 3 Maneuver Areas within the current total heavy maneuver land: the Southern Maneuver Area, the Off-Road Drivers Training Area (referred to in this document as the 19D/K OSUT Maneuver Area) and the Good Hope Maneuver Area. Due to increased throughput demands and as a result of additional training analyses, training impacts in these areas have increased or changed substantially, and additional maneuver space and infrastructure is needed.

Under the proposed action, the training courses described in Section 4.7.2 above will be conducted in the Northern Maneuver Area, the 19D/K OSUT Maneuver Area, the Southern Maneuver Area and the Good Hope Maneuver land (Figures 4-2, 4-5 and 4-6).

The proposed maneuver areas, associated infrastructure and training to be conducted in each area are presented below. Impacts will be the same for both action alternatives in all maneuver areas except the 19D/K OSUT Maneuver Area and the Northern Maneuver Area.

4.7.4.1. Northern Maneuver Area (PN 69742) (FY 2009) - New

The Northern Maneuver Area was not analyzed under the preferred alternative for Transformation (it was analyzed in the other action alternative, which was not approved in the BO or the ROD (USFWS 2007a). Under the proposed MCOE action, 4,677 acres in Compartments O1, O3, O11, O14 and O15 will be used by the USAARMS and 3rd Bde. for off-road heavy maneuver training. Off-road heavy maneuver training will only occur within 25 ft. of roads and trails or will otherwise require approval through the Fort Benning NEPA process (Figure 4-2).

This area is characterized by hilly terrain with narrow ridges and numerous streams and creeks. Portions are currently used by the 3rd Bde for heavy maneuver training.

The southern half of the Northern Maneuver Area will become part of the 19D/K OSUT Maneuver Area described below. The remainder of the Northern Maneuver Area (Compartments O3 and portions of O1, O11, O14 and O15) will be used by the USAARMS and 3rd Bde. for heavy maneuver training (Figure 4-2).

Roads: As with all proposed roads, impacts were assessed at 96 ft. from centerline, however the road width will be approximately 30 ft. Approximately 0.4 mile of new roads and 9.9 miles of road upgrades are proposed in this area; this construction will impact 237 acres (Table 4-1) (Fort Benning, unpub. data). Currently, 19 water crossings are planned within the Northern Maneuver Area (G. Hollon, Fort Benning, pers. comm.).

Support Areas: An approximately 4-acre support area will be constructed in Compartment O3.

Pine Habitat Loss: Construction projects and off-road heavy maneuver (adjacent to roads) in the Northern Maneuver Area could result in the loss of up to 175 acres of pine habitat over time.

4.7.4.2. 19D/K OSUT Maneuver Area (PN 69741) (FY2009)- Reanalyzed

Projects and training impacts in this area are being reanalyzed because of increased training impacts and more defined training information. In the Transformation Biological Assessment, the 19D and 19K OSUT training courses were expected to be conducted in a 1,286-acre "Off-Road Drivers Training Area" in Compartments L1 and L2. As with other off-road heavy maneuver areas, RCW foraging habitat and cavity trees within the maneuver heavy use areas were considered to be 100% lost over time and no impacts were assessed in the remainder of the Maneuver Area. USAARMS personnel delineated approximately 472.7 acres as heavy maneuver use areas within this site (Table 4-2).

Under the proposed action, the 19D and 19K OSUT courses described in Section 4.7.2 will be conducted in the 19D/K OSUT Maneuver Area. Since these are introductory-level courses, all off-road heavy maneuver will be directed by an instructor and will be within 25 ft. of roads and trails.

The 19D/K OSUT Maneuver Area will be located in the northern training areas in Compartments L1-5, O12-14 and portions of O15 (Figure 4-2). Heavy maneuver training will be conducted in O14, O15 and L1-5. The northern half of Compartment O13 will be used for dismounted combat orienteering. A 33-acre Tactical Assembly Area (TAA) hub site containing several buildings will be constructed in the southeastern corner of Compartment O13. This area will be used for 24-hour command and control and will serve as an assembly area for up to 240 Soldiers at 1 time. Compartment O12 will be used for urban combat orienteering. A 10-acre urban area containing several buildings and roads will be constructed. Vehicles will be restricted to designated routes in this area (Figure 4-2).

The 19D/K area is currently used by the 3rd Brigade and the 198th Infantry Brigade. This training will shift to other training areas, including the northern half of the Northern Maneuver Area (Section 4.7.4.1), following the Fort Benning NEPA process.

Roads: Approximately 12.0 miles of new road construction and 26.0 miles of road upgrades are proposed, totaling 829 acres (Fort Benning, unpub. data) . Approximately 15 water crossings will be needed in this Maneuver Area (G. Hollon, Fort Benning, pers. comm.).

Support Areas: Tactical Training Bases will be constructed in O12 (10 acres) and O13 (33 acres).

Pine Habitat Loss: Construction projects and off-road heavy maneuver (adjacent to roads) in the 19D/K OSUT Maneuver Area could result in the loss of up to 624 acres of pine habitat over time.

4.7.4.3. Southern Maneuver Area (PN 69743) (FY 2009)- Reanalyzed

The Southern Maneuver Area, as analyzed in the Transformation Biological Assessment, totaled 6,392 acres and traversed portions of ±28 training compartments (D4-11, D15-17, E4-6, F1 - 2, G3, I1, I3, I4, J3-6 and T2-5). Off-road heavy maneuver would only occur in the area east of Hourglass Rd., which totaled 4,924 acres, and of that, 1,838 acres were analyzed as 100% loss of habitat over time (USACE 2007b). Projects and training impacts in this area are being reanalyzed because of increased training impacts and more defined training information.

The Southern Maneuver Area has expanded slightly to accommodate off-road heavy maneuver traffic parallel to a) First Division Rd. and Helmet Trail to connect Underwood, Red Diamond and Hourglass Rds, and b) an unnamed trail between Underwood and Box Springs Rds. This addition increases the total corridor to 6,675 acres. An additional 614 acres between Underwood and Red Arrow Rds will be used for dismounted training (Table 4-2, Figure 4-5).

Portions of this corridor, primarily east of Hourglass Rd., have historically been, and are currently, used for heavy maneuver training by the 3rd Bde (Figure 2-3). This training will move to other areas within the heavy maneuver lands, including the northern half of the Northern Maneuver Area (Section 4.7.4.1).

Training: The Southern Maneuver Area will be used by the USAARMS as the primary location of 16th Cavalry Regt's Army Reconnaissance Course and the NCOA's 19D BNCOC and an alternate location for the 19K BNCOC (Table 4-3).

West of Hourglass Rd., projected training impacts have not changed from the Transformation Biological Assessment, and proposed Transformation road improvements are no longer planned. Based on preliminary ARC training plans, this area will be used during 1 day of the STX (20 days/ year) for land navigation and 3 days of the FTX (60 days/year) for urban reconnaissance (much of which will be conducted at the CACTF ranges) and UAV training. Use will be restricted to wheeled and dismounted training; tracked vehicles will stay on roads and trails (Figure 4-5). Wheeled vehicles, such as HMMWV's and Strykers, do not require the open timber spacing of the tank maneuver training areas, therefore no timber thinning will be

necessary. While tree mortality due to ground disturbance could still be an issue, the impacts are expected to be minor. Vegetation monitoring proposed in Section 9 will allow Fort Benning to react if unexpected impacts occur, and the USFWS will be notified.

East of Hourglass Rd., projected training impacts have increased in most areas. With the addition of the dismounted area and the connector roads, the total area to be used by the Armor School east of Hourglass Rd. is approximately 5,995 acres. Of this, 4,535 acres will be used for off-road heavy maneuver training, 90 acres for wheeled traffic only and 1,370 acres for dismounted training. Based on preliminary ARC training plans, this area will be used for 1 day of the STX (20 days/year) for operation orders and FTX planning and 7 days of the FTX (140 days/year) by the Infantry, Heavy and Stryker BCTs for a variety of mounted and dismounted training exercises.

In the Transformation Biological Assessment, only those areas delineated as maneuver heavy use areas were considered to have 100% loss of forest cover over time; no loss of RCW foraging habitat or cavity trees was projected for the remainder of the Maneuver Areas. The maneuver heavy use areas are still expected to receive the heaviest impacts, however, because of the increased frequency, duration and intensity of training activities throughout the Southern Maneuver Area (4,535 acres), all off-road heavy maneuver areas were assessed as 100% loss over time. (Note: 50 ft. or 200 ft. protected buffers around RCW cavity trees (described in Section 4.7.3) were categorized as "dismounted maneuver"; no RCW impacts were analyzed within these buffers.)

Maneuver heavy use areas comprised 1,838 acres in the Transformation analyses, however, upon further analysis, some portions are now expected to be used only for light or wheeled maneuver, reducing the maneuver heavy use areas to 1,736 acres.

In order to safely operate tanks off-road, the USAARMS needs an average spacing of 20-30 ft. between trees that are ≥8 in. diameter at breast height (dbh). Approximately 404 forested acres will be thinned to achieve this spacing; the remainder of the area can be used in its current condition. No additional impacts were calculated for this thinning since the target stands fall within the area being assessed as 100% cleared (Figure 4-5).

Roads: Approximately 21.8 miles of road upgrades are proposed, resulting in the loss of up to 502 acres (Fort Benning, unpub. data). An estimated 4 water crossings will be necessary (G. Hollon, Fort Benning, pers. comm.).

Support Areas: Support areas to be constructed and/or established in the Southern Maneuver Area include an ARC support area in Compartments G3 and F1 (approximately 74 acres), an ARC support area compound (approximately 44 acres) (location not definite) and an urban area (approximately 7 acres) in Compartments D10, D16 and D17 (Figure 4-5).

Pine Habitat Loss: Construction projects and off-road heavy maneuver in the Southern Maneuver Area could result in the loss of up to 3,036 acres of pine habitat over time.

4.7.4.4. Good Hope Maneuver Area (PN 69668) (FY 2009) - Reanalyzed

In the Transformation Biological Assessment, the Good Hope Maneuver Area consisted of approximately 11,259 acres in Training Compartments B1-6, Q4-7, CC1-2 and DD1-3 (Figure 4-6). This area is being reanalyzed because the road network and training exercises to be carried out in this area have been better defined.

The Maneuver Area boundary has been reduced slightly to remove areas south of Riverbend Rd. and is now comprised of 11,153 acres (Figure 4-6). This entire area will be used for off-road heavy maneuver training with the exception of some wetlands and eligible cultural resource sites (USACE 2007c). The total maneuver area totals approximately 9,597 acres not including roads and infrastructure (Table 4-2).

Historically, with the exception of the DD Compartments, this area was used for heavy maneuver, but in the past 20 years it has primarily supported land navigation courses and light infantry training that includes use of wheeled vehicles, small arms, blank ordnance deployment and pyrotechnics. Light infantry training will shift to other areas designated for that purpose and will be regulated via the Fort Benning NEPA process. The locations of the relocated land navigation courses are not definite, but will likely be in Compartments E1-3. Regardless of their ultimate location, courses will be laid out so that potential RCW habitat can still be managed (prescribed burning and maintenance of an open midstory) and training can follow the Army RCW Guidelines (USFWS 1996, 2007). The possibility of urban land navigation opportunities, a new concept, is also being explored; this could be conducted in existing cantonment areas (F. Weekley, Fort Benning, pers. comm.).

Most of the Good Hope area is relatively young (≤20 years old) planted longleaf pine forest. Approximately 2,156 acres within Compartments DD1, DD2 and DD3 were acquired by

Fort Benning in the Land Exchange finalized in 2001 (JCA and ICF Kaiser Engineers, Inc. 1998).

The Good Hope Maneuver Area will primarily be used for the BOLC III, which is the largest-scale training course conducted by the USAARMS. During the 4-day STX, the entire Maneuver Area will be used except Compartment B4 and the eastern half of Compartment B3. During the FTX, essentially the entire Maneuver Area will be utilized. Major combat training exercises between 2 opposing Platoons, involving approximately 10 vehicles, will take place in 3 corridors in portions of Compartments B2, B5, B6, Q4 and Q7. Combat between 2 opposing Companies, involving approximately 30 vehicles, will take place in 4 areas containing portions of Compartments B2, B3, B4, B6, CC1, DD1, DD2 and DD3. Approximately 9 TAAs will be located throughout the area (Figures 4-6).

The Good Hope Maneuver Area will also be used as the primary location for the 19K BNCOC and an alternate location for the 19D ANCOC (Section 4.7.2, Table 4-3).

Timber in the 7 maneuver corridors mentioned above will be thinned to achieve a spacing of 20-30 feet between all trees that are ≥6 in. diameter at breast height (dbh). Approximately 2,564 acres will be thinned to achieve this spacing; the remainder of the area can be used in its current condition. No additional impacts were assessed for this thinning since the target stands fall within the area being assessed as 100% cleared..

Roads: Approximately 11.9 miles of new roads or trails and 55.3 miles of road and trail upgrades are proposed for the Good Hope Maneuver Area, totaling approximately 1,523 acres (Fort Benning, unpub. data). An estimated 55 water crossings will be necessary (G. Hollon, Fort Benning, pers. comm.).

Support Areas: Two MOUTs will be constructed, 1 approximately six acres in size in Compartment Q5 and the other approximately 44 acres in Compartment B5 (Figure 4-6).

Pine Habitat Loss: Construction projects and off-road heavy maneuver in the Good Hope Maneuver Area could result in the loss of up to 4,662 acres of pine habitat over time.

4.8. PROJECTS NOT INVOLVING FEDERALLY LISTED SPECIES

Nine projects that are needed to support MCOE have no federally listed species or Critical Habitat present within their limits of disturbance. All of these are cantonment area projects. Initial analysis of these projects indicates they will not result in any direct or indirect

effects to any federally listed species or critical habitat. Furthermore, implementation of these projects would not foreclose the formation or implementation of any reasonable and prudent measures or alternatives that may be developed during formal consultation. Therefore, further analysis and consultation regarding these projects is not required.

Table 4-4. List of projects included in the MCOE actions but have no impacts to Federally listed species on Fort Benning.

Project Number (PN)	Project Title	Fiscal Year	Project Driver
70235	Hospital Replacement	2008	BRAC
69999	Warrior in Transition Complex	2009	GWOT
71065	Troop Store - AAFES	2009	BRAC
65250	Maneuver Battle Lab	2010	BRAC
69151	Dining Facility to Support AST Training	2010	GTA
70026/72456	Classrooms with BN Dining Facilities	2010	GTA
71473	Water Treatment Plant Upgrade and Expansion	2010	BRAC
71620	Dental Clinic Addition	2010	BRAC
72324	Training Barracks Complex, Phase 2	2011	GTA

Four additional projects have multiple locations associated with the same project number. Of these locations, one contains pine habitat within the limits of disturbance while the others have no impact to federally listed species or Critical Habitat. Further analysis and consultation regarding those locations with no impacts is also not required, however, the remaining locations would be subject to formal consultation.

Table 4-5. List of projects included in the MCOE actions where one location associated with the project would not impact pine habitat on Fort Benning.

Project Number (PN)	Project Title	Fiscal Year	Project Driver	Location of polygon with no impact
69406	Unit Maintenance Facilities	2009	GDPR	Marchant St.
69406	Unit Maintenance Facilities	2009	GDPR	Upton Ave.
70027/72457	Classrooms with BN Dining Facilities	2010	GTA	Cusseta Rd.
65246	Recreation Centers, Sand Hill	2012	BRAC	Bourge Ave. at 14th St.
69745	Training Barracks Complex	2012	GTA	North of Bushnell Rd.

5. METHODOLOGY

5.1. PROTECTED SPECIES SURVEYS

5.1.1. TERRESTRIAL SPECIES

In preparation for the Transformation projects, including many of those being reevaluated in this Biological Assessment, USFS personnel conducted a survey on approximately 60,000 acres for 6 Federally-listed plant and animal species known or expected to occur on Fort Benning in 2006: relict trillium, Michaux's sumac (*Rhus michauxii*), American alligator, bald eagle, wood stork and RCW (Figure 5-1). The Good Hope Maneuver Area and other additional areas were surveyed for RCWs in late 2006, Michaux's sumac in summer 2007 and relict trillium in spring 2008 (Figure 5-1) (USACE 2007b; JCA 2008).

Surveys of areas directly impacted by the proposed action that were not surveyed for Transformation are in progress for all Federally-listed species and will be completed for each project prior to any clearing or land disturbance.

Survey methods were similar regardless of the surveyors. Surveys for all terrestrial Federally-listed species include foot transects within potentially suitable habitat. Parallel transects were walked wherever feasible and spaced relative to visibility, terrain and suitability of habitat. Where parallel transects could not be used due to landscape features or man-made obstacles, Global Positioning System (GPS) units were utilized to ensure that all potential habitat was sufficiently covered (USFS 2006; JCA unpub. data). A variety of resources were utilized in preparation for field surveys, including aerial photographs, GIS data, topographic maps, correspondence with the FBCB and other coordination between biologists and Fort Benning (USFS 2006; JCA unpub. data).

Michaux's Sumac, American Alligator and Wood Stork. USFS and JCA survey area boundaries for these species have included all proposed project footprints, beaten areas and Maneuver Areas, with either a 150 or 660-ft. buffer around each, depending on the certainty of the project layout. All potentially suitable habitat for each species was surveyed within this area. Potentially suitable Michaux's sumac habitat was surveyed via foot transects as described above. Riverbanks, marshes, swamps, ponds and lakes were checked for occurrence of wood storks and alligators. Additionally, searches for these species were conducted while walking transects

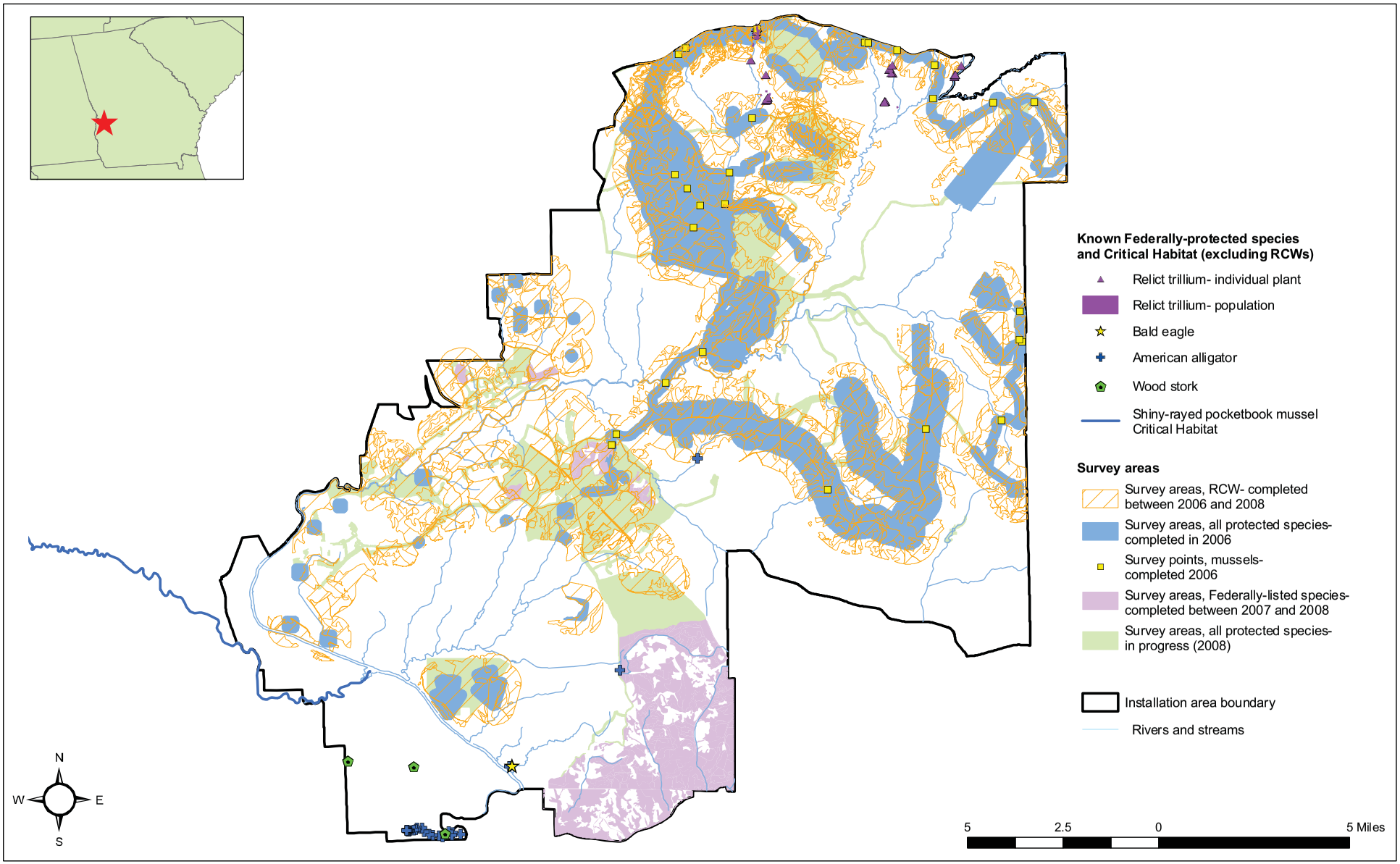


Figure 5-1. Known Federally-protected species locations and areas surveyed for Federally protected species on Fort Benning.

through wetlands for State-listed species, which is necessary for the EIS for Transformation and the proposed action.

Relict Trillium. Surveys for relict trillium were concentrated in potentially suitable habitat, as identified by tree species composition, soil types and proximity to stream corridors. Relict trillium surveys were scheduled during its flowering period (April - June) (Fort Benning 2001).

RCW. All potential RCW nesting habitat on Fort Benning is surveyed on a 10 year rotation (M. Barron, Fort Benning, pers. comm.). In preparation for the Fort Benning Transformation, this rotation was modified so that all areas potentially affected by Transformation projects were surveyed in 2006. According to the Recovery Plan and the Army RCW Guidelines, if a project is to remove potential foraging habitat (defined as pine-dominated habitat ≥30 years old, regardless of Matrix criteria), all potential nesting habitat (defined as stands containing pines ≥60 years old, regardless of Matrix criteria) within 0.5 mile of the project must be surveyed for the presence of RCW cavities within 1 year of project initiation and "regardless of ownership" (USFWS 2003a; DA 1996, 2007). Portions of the 0.5 mile buffers overlap onto private property outside the Installation. Little potential nesting habitat exists within the buffers off-Post, however, any potential habitat found was surveyed with the landowner's permission.

Since RCW surveys must be conducted within 1 year of project initiation, many areas surveyed by USFS have required a resurvey prior to construction (Fort Benning 2008d and 2008e). These surveys have been, and will continue to be, conducted prior to any timber clearing for Transformation or MCOE projects.

Some preliminary data are collected by surveyors as RCW cavity trees are found, including height of cavity, tree species, dbh and understory density. FBCB personnel then visit and verify each cavity tree, tag them with a numbered aluminum tree tag, paint white bands where necessary (all clusters but supplemental recruitment clusters (SRCs)) and record additional data.

5.1.2. FRESHWATER SPECIES

A survey was conducted by USFWS personnel in May and June 2006 for 4 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). Surveys were conducted according to the "Draft- Freshwater Mussel Survey Protocol for the Southeastern Atlantic Scope and Northeastern Gulf Drainages in Florida (FL) and Georgia," (USFWS and GA Department of Transportation 2005). Field reconnaissance determined the stream segments to be surveyed. Twenty-seven sites at existing or future road crossings were determined to be potentially suitable mussel habitat and tactile and visual searches were used in all habitats within those areas (Figure 5-1). The species and number of all freshwater mussels encountered at each site were recorded.

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 for projects analyzed in this MCOE Biological Assessment (S. Abbott, USFWS, pers. comm).

No Federally-listed fish are known or are expected to occur in the project area (USFWS 2008).

5.2. ASSESSMENT OF PROJECT IMPACTS/ ASSUMPTIONS

5.2.1. DETERMINATION OF ANALYSIS "BASELINE"

In order to quantify the impacts of the reanalyzed Transformation projects, analyses were conducted as if those Transformation projects that were not being reanalyzed were completed and operational (i.e., all habitat estimated to be lost over time was 100% gone), and, as if the Transformation projects being reanalyzed had not occurred. Reanalyzed Transformation projects were, in effect, treated as new projects and any habitat projected to be removed in the Transformation BA was "added back in" to the total habitat on Fort Benning.

5.2.1.1. Transformation Habitat Removals

In order to determine how much habitat will remain after Transformation actions that are not being reanalyzed in this document are completed and operational, the most current limits of construction and/ or ordnance impacts were used.

Many of the limits of construction and areas expected to be impacted by ordnance that were analyzed in the Transformation Biological Assessment have changed slightly due to design. As described above in Section 3.3.2, these changes have been, and will continue to be, assessed

via the Fort Benning NEPA process and informal consultation with USFWS. Additional impacts to Federally-listed species have been addressed during informal consultation with USFWS under the Transformation BO (Fort Benning 2008d, 2008e, 2008f and 2008g). For projects that have changed slightly, but for which the NEPA process has not begun, the most current impact limits were used with the assumption that these changes will either have no effect on protected species or impacts will be minor enough to be handled via informal consultation with USFWS. **Fort Benning does not wish to use this Biological Assessment as informal consultation for these minor project changes.** The Fort Benning NEPA process and/or informal consultation will continue to be followed for all Transformation projects as they are designed.

For projects, including access roads, that were 100% designed and for which the Installation NEPA process had begun (Form 144R review completed by FBCB and/ or informal consultation with USFWS underway), construction limits provided by the project's USACE architect and engineering (AE) contractor were used to determine RCW cavity tree and foraging habitat loss, thus replacing the planning-level polygons supplied by Fort Benning. For ranges that were in late, but not final, stages of design and the AE firm and Fort Benning Range Division (FBRD) limits of construction differed, the worst case was used, generally by combining both limits of construction. Range projects that were in late stages of design, but which had no corresponding FBRD limits of construction, were analyzed using the current USACE limits of construction polygon. For the remaining projects, the most current planning limits of construction from the Range and Master Planning Divisions were used.

Range beaten areas (described below in Section 5.2.4) were also updated with the most current areas calculated by Range Division to reflect the best available information, including these changes:

- The method for predicting and delineating the beaten areas has been improved from that used for the Transformation Biological Assessment, resulting in more accurate boundaries. For the most part, the beaten areas were reduced for the small arms ranges and expanded for the larger ranges such as the MPMGs and the STs.
- Previously, the beaten areas were combined with the limits of disturbance and included staging and support areas for a total area disturbed. The updated dataset includes separate polygons for range footprints, the limits of construction (which include support and staging areas) and the beaten areas.
- As FBRD has received designs from USACE contractors, they have been able to conduct Line-of-Sight (LOS) analyses to more accurately predict what areas will receive ordnance impacts. These analyses have substantially reduced the beaten areas for several ranges

from those analyzed in the Transformation Biological Assessment (USACE 2007b) (Figure 5-2).

- Further explanation on how beaten areas were calculated for analyses for Transformation and MCOE can be found in Appendix E.

5.2.1.2. RCW Foraging Partitions

Prior to conducting FHAs for the proposed action, clusters and their partitions that were "taken" in accordance with the Transformation BO Incidental Take Statement (USFWS 2007a) by Transformation projects NOT being reanalyzed in this document were removed from the RCW partition GIS file if they had no chance of meeting Recovery in the future (defined as containing less than 150 acres of total pine habitat post-Transformation). Habitat within these partitions was reallocated to adjacent foraging partitions (USACE 2007b). Five partitions were deleted during this analysis: HCC-03R, O08-03R, R01-01, R01-03R and U04-01R. In addition, 2 "taken" clusters were deleted by FBCB in preparation for construction of the Stationary Tank Range (PN 65382) in 2008 (O09-04R and O09-05R) (see Section 2.4.11).

Clusters "taken" by the DMPRC were also deleted prior to MCOE analyses for the proposed action if they had no chance of meeting recovery in the future (USACE 2007b). Deleted DMPRC clusters included: D03-02, D13-01, D13-02R, D14-04, J06-01 and K22-02. (Note: although "taken," all but Cluster D14-04R listed above were active in 2008).

Activity status for all RCW analyses was based on FBCB 2008 breeding season data. No FHAs were conducted on inactive RCW clusters that were impacted by projects for the proposed action. Thirteen inactive impacted clusters were deleted and foraging habitat was reallocated to adjacent active clusters (D17-02, F01-02R, HCC-01R, J03-02R, K01-01R, K03-01R, K05-01R, O07-02R, O09-03R, O12-04, O13-05, R01-02R and SHC-01R).

Note: Foraging habitat analyses were not conducted for Clusters R01-01 and R01-03R since the project impacting them, the Vehicle Recovery Course (PN 72017), has not changed since the Transformation Biological Assessment and was certain to result in "takes" of both clusters.

5.2.2. OVERLAPPING LIMITS OF CONSTRUCTION

A few projects are in close proximity to one another and have the potential to disturb the same areas during construction (staging areas, grading, common parking areas, etc.). In order to

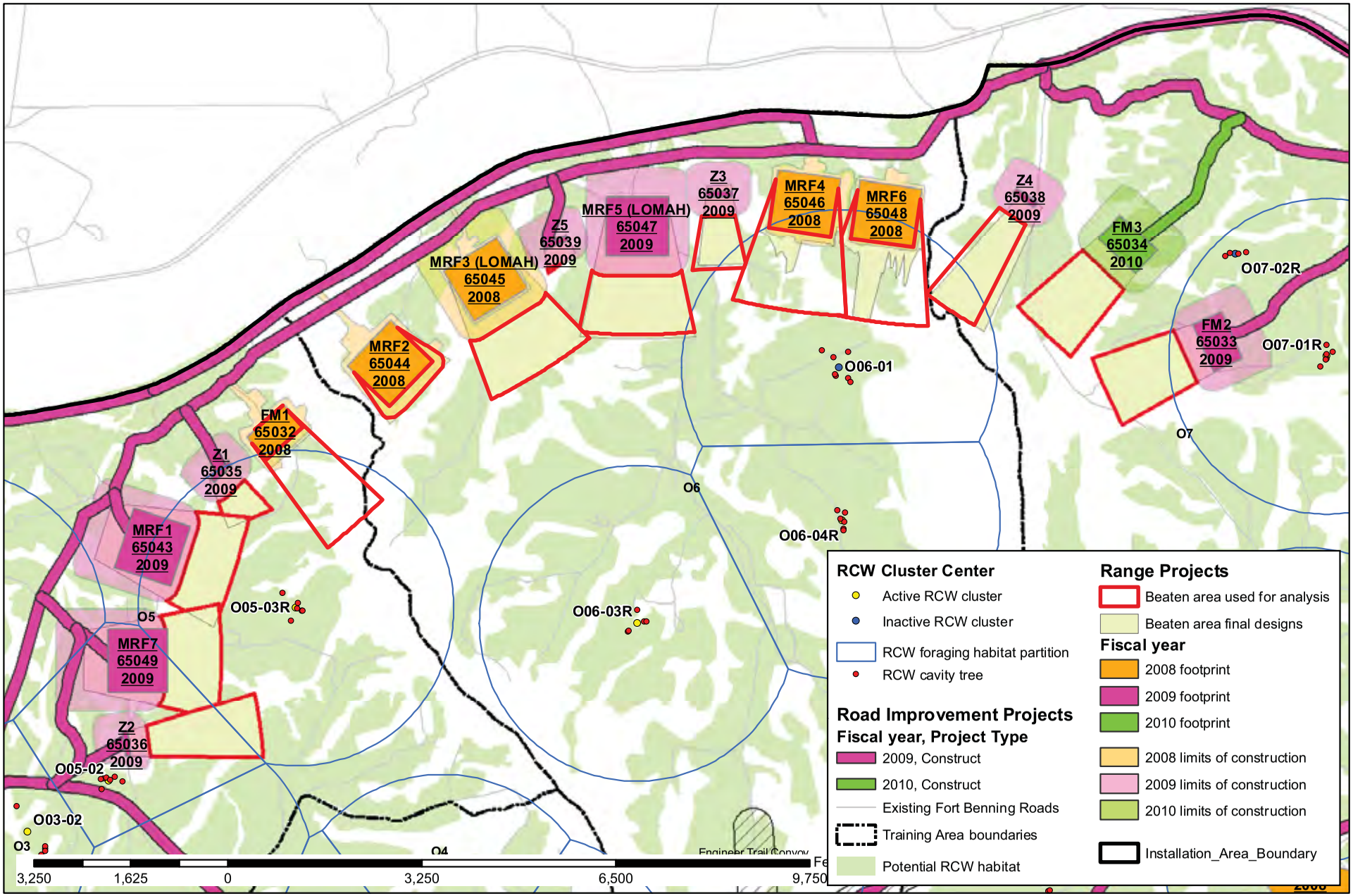


Figure 5-2. Comparison of beaten areas for ranges in the Oscar Small Arms Range Complex analyzed in the Transformation Biological Assessment to those calculated using line-of-site analyses with final designs. Final designs are shown for all 2008 ranges.

avoid double-counting the disturbed acreage and/ or impacts to biological resources, the overlapping area was allocated to the earliest FY project for analysis. The acreages presented in Tables 4-1 and 4-2 represent the maximum area disturbed by each project and are the areas that will be provided to AE contractors to use as their construction limits. The acreages used for analyses are included in the text description of each project (Section 4.5).

5.2.3. CANTONMENT AREAS

In order to complete the extensive number of military construction (MILCON) projects necessary to implement the 2005 BRAC recommendations within the allowed timeframe, USACE has changed the protocol for MILCON project proposals and construction (USACE 2006b). Cantonment projects are "design-build," meaning that the USACE design team does not supply designs to prospective construction contractors. Instead, on the Request for Proposals (RFPs), contractors are provided the general specifications of the project and a map with the construction limits. The contractor must design, then construct the facilities within the construction limits specified on the maps. There are no final designs available for projects in the proposed action. RFPs will contain site plans with environmentally sensitive areas taken into account, and Fort Benning will work with design firms to minimize impacts to Federally-listed species as much as practicable (D. Miller, Fort Benning Master Planning Division, pers. comm.).

Because avoidance of Federally-listed species and their habitat is not guaranteed for the cantonment projects, construction limits were used as the project site for each cantonment project. For RCW foraging habitat and cavity tree impacts, 100% loss on the project site was assumed. Although the project limits of construction ("polygons") were delineated to avoid or minimize impacts to Federally Threatened and Endangered species and their habitat, it is still likely that actual impacts on these sites will be less than that is analyzed.

5.2.4. RANGES

Range projects are "design-bid-build," meaning that Fort Benning will have significant input during the design process. Very few of the proposed MCOE ranges are in the design phase. The remainder of the proposed range projects was analyzed using footprint and limits of construction polygons supplied by FBRD Integrated Training Area Management (ITAM) personnel. These polygons should represent the maximum extent of disturbance during

vegetation clearing and construction of the proposed range and include access roads, staging and support areas. In many cases, range limits of construction are considerably larger than the expected final clearing limits in order to give engineers some flexibility during design.

All proposed range footprints and their limits of construction, including the Vehicle Recovery Course, were assumed to be 100% cleared of all vegetation, including RCW cavity trees. However, some forested habitat may remain post-project. FBRD expects to be able to avoid all RCW cavity trees within the limits of construction and outside the range footprints (F. Weekley, Fort Benning, pers. comm.) thereby reducing RCW impacts around the MPMGs and within the Vehicle Recovery Course. As ranges are designed, and following the protocol established in the Transformation Biological Assessment, "taken" RCW foraging habitat remaining post-construction will be added back into the total pine acreage, with USFWS concurrence.

The only impacts outside of the range limits of construction, but within the SDZs, were the beaten areas, described below. The areas of concern within the SDZ are the ordnance dispersion area, impact area, ricochet area and the target area (AR 385-63, 2003). The dispersion area consists of the distribution of rounds fired by 1 weapon or group of weapons under identical or nearly identical circumstances. It represents a pattern of fire and helps predict where rounds fired by a certain weapon or weapon system will land. The shape and size of the SDZ vary with the type of weapon being fired. The probability of rounds hitting is greatest in the firing and target areas, then the impact areas, then the danger areas.

While most of the environmental impacts will be within the range footprints, for some ranges a substantial amount of ordnance impact could occur outside of the footprint, but within the SDZ areas. Those areas that are likely to receive enough impacts from live fire to result in tree mortality were identified by FBRD as "beaten areas" to be analyzed in this document. "Beaten areas" within the ordnance impact area (defined above) of each range were delineated using topography, aerial photography of similar ranges on Fort Benning and data on the types of ordnance used, using methodology described in Appendix E. For analyses in this document, beaten areas were expected to experience 100% loss of Threatened or Endangered species habitat over time from live fire impacts, although these areas will not be deliberately cleared of vegetation. Habitat loss could be overestimated or underestimated depending on actual ordnance impacts. Also, the beaten areas for many of the proposed ranges in the Oscar Complex were

created assuming that no berms would be built. Any habitat remaining after the ranges are operational which could be counted as potential RCW foraging habitat will be added back into the total pine acreage, with USFWS concurrence.

The extent of impacts (100% loss) from the range footprints, limits of construction and beaten areas are the same, however, the time frame and type of disturbance differ. The range footprints and limits of construction will be impacted during timber harvesting and range construction, while the beaten areas will not have any impacts until the ranges are operational. The Beneficial Occupancy Date represents when the range will become operational. The Beneficial Occupancy Date data were provided by FBRD and were used to analyze the beaten areas for each range in the appropriate fiscal year ("Date Operational" on Table 4-1).

Projected uses of ranges and times of use are taken from the 2006 RDP, which is based on the premise that, with the MCOE, Fort Benning will support USAARMS, USAIS and active duty units (USACE 2006a). Typically, active duty units and Army schools train primarily on weekdays, and training is normally not scheduled on weekends or over holidays. For the RDP and this Biological Assessment a total of 242 available training days was used, the result of 365 days/year minus 15 days for winter holidays, 4 days for Thanksgiving, 5 3-day holidays, 1 day for Independence Day and 88 days for the remaining weekends (USACE 2006a). Ranges assessed were proposed, in part, because a deficiency/ shortfall was identified in the RDP. These shortfalls could be that a required range type does not exist, exists but is not standard or exists but there is insufficient capacity to meet the throughput requirements.

5.2.5. ROADS

Road limits of disturbance were provided by FBRD, which JCA overlaid onto the foraging habitat delineations to calculate the acreage impacted. Although the road operational width will typically be 30 feet, a disturbance limit of 96 ft. from the centerline was analyzed for all training area roads and trails to allow flexibility in design and to account for construction needs such as grading, berms and erosion control measures (F. Weekley, Fort Benning, pers. comm.).

All roads were analyzed in this assessment, regardless of the funding sources. Therefore, the linear feet analyzed for any single project may not match its corresponding DoD Form 1391.

All habitat within the disturbance limits (described above) was assumed to be 100% cleared for analyses herein although it is unlikely that all areas will be cleared. Soil and topographic surveys will be completed and road layouts are likely to change as roads are designed. Thus, some projected RCW impacts may be avoided. Fort Benning will work with planners to minimize impacts wherever possible and will notify USFWS if impacts are materially different from what was assessed in this Biological Assessment.

5.2.6. MANEUVER AREAS

One cluster (D11-02) could not be avoided by tracked or wheeled vehicles. Its cavity trees were analyzed as experiencing 100% mortality over time. Either a 200-ft. (maneuver heavy use areas) or a 50-ft. (remainder of Maneuver Areas) buffer was delineated around all other cavity trees within the Southern Maneuver Areas, and was assessed as dismounted maneuver. While cavity trees in this cluster do not need to be removed at this time, tracked and wheeled vehicles will need to maneuver within 50 ft. of them. This greatly increases the risk of tree mortality due to root damage and subsequent decline, especially with loblolly pines (L. Eckhardt, Auburn University, pers. comm.). Cavity trees within Cluster D11-02 were therefore analyzed as experiencing 100% mortality over time. All other cavity trees within the Southern Maneuver were analyzed for dismounted maneuver. No impacts were assessed within these buffers.

The maneuver heavy use areas are still expected to receive the heaviest impacts within the Maneuver Areas, however, because of the increased frequency, duration and intensity of training activities expected in the Southern Maneuver Area all areas used for off-road heavy maneuver were analyzed as being 100% loss of RCW foraging habitat over time.

Outside of the heavy maneuver use areas, but within the Maneuver Areas, maneuver training will stay ≥50 ft. from cavity trees and otherwise adhere to the applicable Army RCW Guidelines (DA 1996, DA 2007), therefore no direct cavity tree impacts were assessed. Keeping vehicles 50 ft. from tree trunks, or optimally from the edges of the crowns, minimizes root damage and greatly increases the chances of tree survival, especially in light of forest decline (L. Eckhardt, Auburn University, pers. comm.).

5.3. CLUSTER LEVEL ANALYSES (INCLUDING FORAGING HABITAT ANALYSES)

5.3.1. DATA COLLECTION AND FORAGING HABITAT CALCULATIONS

Forest stands are inventoried once every 10 years, or 10% of the Installation is inventoried every year (DA 2001). However, the 2003 Recovery Plan requires new data parameters that have not been collected in the past, some of which are used to determine Incidental Take. For this reason, current foraging habitat data was collected for all pine-dominated stands within or partially within each 0.5-mile radius RCW foraging partition that was affected by the proposed action (foraging habitat partitioning methodology described in Section 5.4.2).

Foraging habitat data were collected between 3 January 2006 and 29 July 2008 for approximately 54,178 acres (approximately 1,978 pine-dominated stands) by qualified FBLMB personnel with some assistance from Fort Stewart Forestry Branch personnel. Data were collected for every pine-dominated stand ≥30 years old that was at least partially within a 0.5 mile radius RCW foraging habitat partition potentially affected by a Transformation and/ or MCOE project, according to USFWS guidance on procedures for collecting FHA data (USFWS 2005). FBCB and JCA first determined which RCW clusters would be affected by Transformation and/or MCOE projects, either by the removal of cavity trees or by the removal of pine-dominated habitat within their 0.5 mile radius foraging partitions. FBLMB then determined which stands were within affected partitions and collected FHA data for those entire stands (not just the stand sections within the partitions).

Stands were delineated on aerial photography according to characteristics such as species composition, age and/ or distribution of age classes. Each stand (10 acre minimum, with exceptions) was identified by a name containing with a training compartment letter(s), a 2 digit compartment number and a 2 digit stand number.

Sample points in each stand were determined using a GIS systematic random procedure and were modified to allow for an adequate distribution of points to reflect stand diversity. The sample points were systematically placed on a square grid pattern (in each cardinal direction), and the distance between sample grid points were determined by stand acreage. A line transect was established along the longitudinal axis of each stand; transects that paralleled drains, ridges, trails and other linear features were avoided if possible. If 1 transect was not sufficient to collect

enough data points, the sampling scheme (e.g., parallel transects, perpendicular transects, triangular transects) was modified to allow for an adequate distribution of points to reflect stand diversity. Sample points were collected in 2-5 chain (1 chain = 66 ft.) intervals along each transect; the first point in each stand was placed at one-half the distance between sample points.

Homogeneous stands were defined as pine plantations less than 30 years old. All other stands were considered heterogeneous. Ten points were collected for homogeneous stands and 20 points were collected for heterogeneous stands. If a stand was smaller than 10 acres, 1 point per acre was collected for both homogeneous stands and heterogeneous stands. 2003 forest inventory stand ages, adjusted to 2006, were used unless there was evidence indicating that these ages were incorrect. In this instance, age was determined at every other plot by aging 1 dominant or codominant pine tree using an increment borer, except in pine plantations, where it was only necessary to core 1 tree per stand.

Pine and overstory hardwood data were obtained using a 10-factor BA prism and the variable radius prism-plot method. The following characteristics were recorded for each sample plot: tree species, dbh of each pine and hardwood tree > 5 in. dbh, health of tree (crown vigor) and applicable disease/insects.

Midstory data was collected at all sample points using a 0.1-acre circular plot (~37 ft. radius). Midstory species were categorized as scrub oak, sweetgum, upland hardwood (red oak, white oak, hickory) or other hardwood. Determining midstory density was subjective, but followed these basic criteria: a stand with a sparse hardwood midstory had few or no hardwoods present, a stand with a dense hardwood midstory had limited visibility and movement through the stand was difficult, and a stand with a moderately dense hardwood midstory was intermediate. Each habitat type was further subdivided according to hardwood midstory height. Midstory hardwoods less than 7 ft. in height were considered low, hardwoods from 7-15 ft. in height were considered moderate and hardwoods greater than 15 ft. in height were considered tall.

Groundcover data was collected at all sample points using a 0.01 acre circular plot (~11 ft. radius). Four percentages (totaling 100%) were recorded: % herbaceous ground cover, % bare ground, % pine straw and % woody vegetation. Stand fire history was recorded as the date of the last prescribed burn.

Plot data were collected by FBLMB using PocketDog software (Foresters Incorporated (Inc.) 2006) on Trimble® Recon® GPS units and summarized using OfficeDog software (Foresters Inc. 2006). The creators of this software, Foresters Inc., were also contracted to provide Fort Benning with the ability to generate tables in the correct format that summarized all of the data needed for the USFWS RCW Foraging Habitat Matrix (USFWS 2006a) (USFWS Matrix Tool Version 1.0.0.7, 2006), in addition to other specific forestry data.

The custom summary table output by the Foresters Inc. software was then joined to the stand delineation GIS shapefile by FBLMB. These delineations, complete with all associated data, were used by JCA to import into the Matrix.

The Matrix was used to determine the suitability ("score") of each stand using the Standard for Managed Stability (SMS) and the Recovery Standard (RS) (USFWS 2003a). However, there were several parameters, either specific to Fort Benning or otherwise, that were necessary for evaluation of the stands and that were not generated by the Matrix. For this reason, we did not use the summary tables generated by the Matrix, but instead used the scores generated by it along with attributes from the shapefile to create summary tables for each cluster in Microsoft® Excel™.

To calculate pre- and post-project acreage totals, GIS tools in ArcMap™ (Environmental Systems Research Institute® (ESRI) 2005) and XTools Pro© (Data East 2003) were utilized.

5.3.2. FORAGING HABITAT PARTITIONING

One half-mile radius foraging habitat partitions were created using the Foraging Matrix (USFWS 2006a) for every RCW cluster on Fort Benning, including active, inactive and unmanaged clusters. However, since the USFWS does not issue Incidental Take for inactive clusters, and the habitat allocated to them is probably being used by adjacent groups, inactive clusters were ignored for the purposes of the FHAs and their respective habitat reallocated to adjacent active clusters. The 0.5 mile radius foraging partitions were thus modified, leaving out the inactive clusters affected by the proposed action. The partitions created during this step were used to calculate the pre-project foraging habitat totals found in Section 6.8.

In some areas 2 or more adjacent clusters were "taken" by loss of foraging habitat and/ or cavity trees. Where there was sufficient combined habitat remaining post-project amongst "taken" partitions to support at least 1 cluster, new partitions were created using either the

"taken" cluster in the best condition (foraging habitat or cavity trees) or shifting 1 of the cluster centers in order to optimize the use of the available habitat. Groups in these clusters were still considered to be "taken," however, through repartitioning or artificial cavity installation these clusters may be able to meet recovery in the future. Experience has shown that remaining RCW groups will adjust to the new configuration of habitat. The results of this repartitioning can be found in Section 6.8.4.

5.3.3. FORAGING HABITAT GUIDELINES

Foraging habitat was assessed using both the Standard for Managed Stability (SMS) and the Recovery Standard (RS) described in the Recovery Plan (USFWS 2003a). SMS is typically the threshold used for Incidental Take, therefore, all projects impacting RCWs must be measured against the SMS criteria (USFWS 2006e). Since Fort Benning is a RCW Primary Core Recovery Population, foraging partitions must also be analyzed using the RS in order to show that each cluster has the potential to meet RS in the future.

The SMS requires a minimum of 3,000 square ft. (ft^2) of pine BA in stems $\geq$10 in. dbh on at least 75 acres of good quality foraging habitat contiguous to the cluster as defined below (USFWS 2003a):

a. Pine stands must be at least 30 years of age or older.

b. Average BA of pines $\geq$ 10 in. dbh must be between 40 and 70 ft^2/acre.

c. Average BA of pines < 10 in. dbh must be less than 20 ft^2/acre.

d. If a hardwood midstory is present, it must be sparse and less than 7 ft. in height.

e. Total stand BA, including overstory hardwoods, must be less than 80 ft^2/acre.

Additionally, it is recommended that all land counted as foraging habitat be within 200 ft. of another foraging stand or the cluster itself and that all land counted as foraging habitat should be within 0.25 mile of the cluster (USFWS 2003a).

Non-foraging habitat is not defined for the SMS in the Recovery Plan, however, the definition in the RS is: 1) any predominately hardwood forest, 2) pine stands <30 years old, 3) cleared land such as agricultural lands or recent clearcuts, 4) paved roadways, 5) utility rights-of-way and 6) bodies of water (USFWS 2003a).

USFWS guidance since the Recovery Plan has established the following clarification of the total stand BA requirement:

• Overstory hardwood BA must be ≤10 ft^2/ acre

• Total stand BA can exceed 80 ft^2/ acre if the maximum limits for overstory hardwood BA and pines <10 in. dbh are not exceeded, and the BA in pines 10-14 in. dbh is 40-70 ft^2/acre (in other words, the excess in BA is comprised of pines ≥14 in. dbh.) (R. Costa, USFWS, pers. comm.).

In addition to low and sparse hardwood midstories being suitable (criteria d. above), sparse-medium and sparse-tall midstories were also considered to be suitable in this assessment. This modification is acceptable as long as there is data to support stability and breeding success of the resident RCW groups (R. Costa, USFWS, pers. comm.).

Other than age, the only minimum criteria for stand suitability (listed above) in the SMS is the BA in pines ≥10 in. dbh; all other criteria are maximum values that could be improved with management. Therefore, in most cases, if a stand meets the BA in pines ≥10 in. dbh criteria, it will be classified as either "suitable" or "potentially suitable" habitat. Of 254 occupied foraging partitions analyzed in preparation for the Transformation Biological Assessment, 62 (24.4%) had ≥75 acres of stands with a minimum of 40 ft^2/ acre in pines ≥10 in. dbh and could potentially meet the SMS. Of these, 18 partitions (7.0%) had ≥120 acres and 44 (17.3%) had 75-119 acres. Twenty-three clusters (9.1%) contained 0 acres of stands with ≥40 ft^2 BA/ acre. The majority (168 clusters) (66%) of the partitions contained <75 acres with ≥40 ft^2 / acre in pines ≥10 in. dbh (USACE 2007b).

Conversely, 163 (64%) clusters had ≥75 acres of stands with a minimum of 30 ft^2/ acre, of which 84 clusters (33.0%) had ≥120 acres and 79 clusters (31.1%) had 75-119 acres. Eighty-8 clusters (34.6%) had <75 acres of habitat, and 3 clusters (1.2%) contained no stands with a minimum BA of 30 $ft.^2$/ acre.

Less than 25% of the active RCW clusters on Fort Benning have the potential to meet SMS as defined in the Recovery Plan, yet, the Fort Benning RCW population has continued to grow (FBCB unpub. data,) (Section 6.8.2). The average rate of growth over the last 5 years is 2.7%, or 4.5% over the last 12 years (M. Barron, Fort Benning, pers. comm.). Because coarse analyses suggested that RCWs on Fort Benning are able to survive and be reproductively successful in lower quality habitat than that described by the SMS, Fort Benning and the USFWS agreed to examine the specific foraging habitat use of the Fort Benning RCW population.

In order to determine how the fitness of RCW groups in the project area compared to the available habitat, FBCB personnel analyzed the breeding history of clusters that would be affected by the proposed action relative to the total acreage and BA of pine stands in each partition, the acres and BA of suitable habitat using the SMS, and the acres and BA meeting all SMS criteria except the minimum BA in pines ≥10 in. dbh. None of the results were statistically significant, however, some general trends were noted. Group fitness did not show any obvious trends when compared against the SMS because only approximately 20% of the partitions analyzed met the SMS criteria. Data for the acres and BA meeting all SMS requirements except the minimum BA in pines ≥10 in. dbh (30 or 35 ft^2/ acre) also did not show a strong trend, other than that groups with <50 acres of habitat were less productive than those with more habitat. The data for fitness and the total acres of pine-dominated habitat, regardless of SMS suitability, revealed a decreasing trend in breeding success and group size for partitions with <50 acres of total pine habitat or ≥200 acres of pine habitat (Table 5-1). The latter effect is likely related to group density more than foraging habitat, as some clusters on the Installation are somewhat isolated and therefore less likely to contain PBGs.

The USFWS recognizes that individual RCW populations can become adapted to local environmental conditions that differ substantially from those defined as the SMS. The Recovery Plan provides an allowance for individual populations to develop population-specific guidelines that better reflect what birds are surviving in specific areas (USFWS 2003a). Additionally, further USFWS guidance (2005) recognizes that some sites may not currently, or ever, meet the SMS because of catastrophic events, past land use history or ecological reasons. In cases where birds have adapted to conditions that do not meet the SMS, making a "take" determination "based solely on the SMS may not always reflect the use of best scientific information available". There may be cases where a cluster does not meet the SMS as defined in the Recovery Plan, yet no Incidental Take Statement is issued (USFWS 2005). Proponents with a "take" that is questionable or who wish to develop population-specific guidelines must demonstrate, through sound science, that multiple generations of RCWs have been stable under the current site conditions. Demographic data must also show that RCW group fitness is not

Table 5-1. Total pine acreage within active red-cockaded woodpecker (RCW) foraging habitat partitions as compared to group fitness.

Average # RCWs/ cluster	<50 acres *(3 clusters)*	<75 acres *(8 clusters)*	76-100 acres *(14 clusters)*	101-120 acres *(14 clusters)*	121-150 acres *(33 clusters)*	121-200 acres *(52 clusters)*	151-175 acres *(11 clusters)*	176-200 acres *(8 clusters)*	200+ acres *(28 clusters)*
# Nestlings	2.43	2.57	2.50	2.41	2.56	2.54	2.52	2.47	2.38
# Fledglings	1.92	1.97	2.17	2.01	2.07	2.04	2.00	1.96	1.84
# Adults	2.11	2.27	2.29	2.50	2.35	2.32	2.26	2.32	2.30

diminished as a result of insufficient habitat and preferably establish a threshold where habitat quantity and/ or quality begins to affect group fitness (R. Costa, USFWS, pers. comm.).

During informal consultation with USFWS a revised SMS was authorized based on 10 years of demographic data provided by FBCB as described above. It is important to note that the revised SMS is a temporary allowance as Fort Benning continues its transition to a longleaf pine-dominated forest. Using this revised standard, all SMS criteria as listed in the Recovery Plan (USFWS 2003a) and above must be met, except that the acceptable BA range for pines ≥10 in. dbh is expanded to include stands with an average BA of ≥30 ft^2/acre. The minimum acreage required is directly correlated to the average BAs of stands within the partition; partitions containing stands with BA of 40 ft^2/ acre would still require a minimum of 75 acres, however, partitions with stands averaging 30 ft^2/ acre BA would require 100 acres to meet the minimum of 3,000 ft^2 total BA.

While Incidental Take is not issued until habitat is brought below the SMS, recovery populations have a responsibility to manage toward the RS, and must ultimately meet the RS in order to meet 1 of the recovery criteria. Because Fort Benning is a Primary Core Recovery Population, foraging habitat impacts were also assessed using the RS, both for current suitability and the ability of each cluster to reach the RS in the future. The RS is commonly referred to as a "desired future condition" of habitat for all increasing RCW populations (USFWS 2005).

The RS requires a minimum of either 120 acres or 200-300 acres of good quality foraging habitat (as defined below) depending on the site indices of soils and dominant pine species within the foraging partition. For systems of high productivity (site index of 60 or more for the dominant pine species), the RCW Recovery Plan (USFWS 2003a) requires that a minimum of 120 acres of good quality foraging habitat be provided for each group of RCWs. For sites with low productivity (site index below 60 for the dominant pine species), 200-300 acres of good quality foraging habitat are required for each RCW group. The majority of soils on Fort Benning have a site index ≥60 (DA 2001) (Section 3.2.6), therefore 120 acres was used for our RS analyses.

Good quality foraging habitat according to the RS is defined as follows (USFWS 2003a):

1. There must be a minimum of 18 pine stems ≥14 in. dbh per acre that are ≥ 60 years old. The minimum BA for these pines is 20 ft^2/ acre.
2. The BA for pines from 10-14 in. dbh must be from 0-40 ft^2/ acre.

3. The BA of pines <10 in. dbh must be <10 ft^2/ acre and <20 stems/ acre.
4. The minimum combined BA for categories 1 and 2 above is 40 ft^2/ acre.
5. Native herbaceous species must cover at least 40 % or more of the ground.
6. No hardwood midstory exists, or if present, is sparse and less than 7 ft. in height.
7. Canopy hardwoods are absent or less than 10% of the number of canopy trees in longleaf forests and less than 30% of the number of canopy trees in loblolly, shortleaf and other pine forests.
8. All habitat must be within 0.5 mile of the center of the cluster.
9. Foraging habitat must not be separated by more than 200 ft. of non-foraging habitat, as defined above with the SMS criteria.

5.3.4. CLASSIFICATION OF HABITAT

Pine stands that met the revised SMS or RS overstory guidelines and had a sparse hardwood midstory, a moderately dense hardwood midstory that was low in height or a dense hardwood midstory that was low in height were considered "suitable" foraging habitat.

"Potentially suitable habitat" was described as stands that met the minimum requirements, but exceeded maximum limits of pines in certain dbh classes, hardwood midstory density or height and overstory hardwood density. These stands have the necessary pine BA and would meet the revised SMS or RS with midstory removal, prescribed burning and/ or thinning. Stands with suitable overstory characteristics containing a moderately dense or dense midstory that was moderate or tall in height were in this potentially suitable category. *[Note: all stands meeting the "potentially suitable" criteria are currently presented as such in the summary tables in Section 6.8 and the Appendices. However, it is possible that, upon examination, FBLMB will find some of these stands to not be improvable. These stands will then be considered "unsuitable habitat".]*

All pine-dominated stands that did not fall into the suitable or potentially suitable pine categories were classified as "future potential habitat." These stands will require time to meet the revised SMS or RS pine density, size (dbh) and/ or age requirements.

Stands within the A20 Dudded Impact Area were inaccessible and were delineated by FBLMB using aerial photography. The age of these stands was approximated by FBLMB using historical stand data however no pine stem or basal area data was available. Since this habitat

makes up a considerable portion of partitions within and adjacent to the A20 Dudded Impact Area this habitat was included in foraging analyses considered "forested acres."

Areas that will not be suitable habitat for many years, if ever, and stands that are not managed by FBLMB were classified as "unsuitable" habitat. This designation included hardwood drainages that would not typically support a pine-dominated overstory regardless of management, cleared areas that have not been replanted in pines, upland hardwood stands that are not planned for conversion to pine, paved areas, open water and impact areas or other inaccessible stands.

As stated in Section 5.3.3 above, the SMS requires that habitat cannot be separated by >200ft. of non-foraging habitat, defined in the Recovery Plan as: 1) any predominately hardwood forest, 2) pine stands <30 years old, 3) cleared land such as agricultural lands or recent clearcuts, 4) paved roadways, 5) utility rights-of-way and 6) bodies of water. The RCW Matrix software application, however, classifies stands as "noncontiguous" if they are separated by any stand that is not classified as current "suitable" foraging habitat (USFWS 2006a). Due to the poor habitat conditions on much of the Installation, approximately 21% of active RCW clusters have stands of suitable habitat that are separated by stands of future potential habitat. In 15% of the active clusters, the cavity trees are located in habitat designated as future potential habitat. For the purposes of this analysis, future potential habitat not meeting the "non-foraging habitat" criteria listed above was allowed to connect suitable habitat even though it might be substandard at this time.

While pine stands <30 years old cannot connect suitable habitat today, these stands will contribute to habitat totals and contiguity at recovery. In determining clusters' ability to meet recovery in the future, pine stands <30 years old were treated the same as any pine habitat in their ability to serve as links between other pine stands.

Some foraging stands were inaccessible because of physical barriers such as ravines, therefore no stand data were collected. In addition, some stands are not capable of being managed for pine. These stands are listed in the foraging habitat tables for the applicable RCW partitions, but are specified as "not managed" and were not counted toward the foraging habitat totals.

5.3.5. LOBLOLLY DECLINE RISK ANALYSES

A GIS model created for Fort Benning by Louisiana State University Agricultural Center (Eckhardt 2004b) was used to quantify the likelihood that pine stands remaining post-Transformation will show symptoms of decline (see Section 3.1.9.2 for decline information). This model, the Loblolly Risk Analysis Map, divides all habitat on Fort Benning into 4 risk categories: minimal, low, moderate and high. These categories were taken from studies at other properties and were based on a variety of factors including slope and aspect. However, because the level of disturbance (such as military activity) on Fort Benning is substantially higher than on other lower-use properties studied such as National Forests, the probability of stands showing decline symptoms at Fort Benning greatly exceeds that observed at the other properties. Dr. Eckhardt has indicated that areas falling into the "moderate" category on Fort Benning are at the same risk of decline as "high" risk areas on other properties. Therefore, for the purposes of our analyses, moderate and high-risk areas were treated as "high risk" (L. Eckhardt, Auburn University, pers. comm.).

In order to determine the decline risk of foraging habitat remaining post-MCOE in each impacted RCW cluster, we calculated the acreage of pine habitat classified as loblolly, shortleaf or mixed pine that was suitable or "potentially suitable" by the modified SMS and was within "moderate" or "high" decline risk zones. Pine stands with no species designation were included with the loblolly and shortleaf totals (worst case scenario). Although slash pine stands are generally unhealthy across Fort Benning, this condition is caused by other factors, namely fusiform rust *(Cronartium quericum f. sp. fusiforme)*. Since the risk of this disease is not linked to the factors weighed in the loblolly risk map, slash pine was not included in the "high risk" acreage totals.

The proposed projects and training area uses that are most likely to increase an area's decline risk above its current classification are the Maneuver Areas and the Vehicle Recovery Course, since the risk of decline is elevated with any soil disturbance. This increased risk was captured in the foraging habitat analyses by assuming 100% loss of foraging habitat over time within the off-road heavy maneuver areas within the Maneuver Areas and in the entire Vehicle Recovery Course. Outside of these condensed areas, the extent and effect of an increased decline risk resulting from heavy maneuver exercises cannot be predicted. Training impacts

outside of the maneuver heavy use areas will be carefully monitored by Fort Benning and any unexpected habitat losses will be reported to USFWS.

For each cluster that had foraging habitat removed for a MCOE project, the acreage of potentially suitable and suitable habitat that was in a high risk area is presented and it is noted if the project will increase the risk of decline.

5.3.6. CAVITY TREE IMPACTS

The cavity stage, shape and activity were recorded for all RCW cavities in trees being removed. Cavity trees within the construction limits of cantonment projects, roads and ranges were considered to be removed. Although cavity trees that could not be protected within the maneuver heavy use areas (1 cluster) and trees within range limits of construction and beaten areas will not necessarily be cut, they were analyzed as "removed" because of the likelihood of tree mortality resulting from construction and training impacts.

5.3.7. HARASSMENT

Chances of nest failure as a result of harassment increase relative to the distance of the nest tree from a proposed project type and activity level, nest stage (incubating eggs vs. nestlings), activity, historic level of disturbance compared to increased level, the type of vehicles/ equipment used and the number of years the cavity tree has been the nest tree (USFWS 2006b (as pertaining to traffic disturbance)). In order to assess harassment impacts, all cavity trees within 200 ft. of proposed land clearing or disturbance were recorded. This includes proposed new or improved roads, vertical construction projects, range footprints, range "beaten areas," and maneuver heavy use areas. Other pertinent data included the activity of each cavity tree, whether or not it had been a nest tree, and if so, how many years it had been the nest tree.

Cavity trees that would not be removed for project construction, that contained ≥1 active completed cavity and would be within 50 ft. of proposed construction limits were considered to have a harassment impact. Cavity trees that would not necessarily be cut, but were in areas where 100% habitat degradation is expected over time and/or the Army RCW Guidelines (DA 1996, 2007) will not be followed (e.g., some maneuver heavy use areas and range beaten areas) were also considered to have a harassment impact.

No impacts (i.e. harassment) were analyzed for cavity trees within the Maneuver Areas outside of the "maneuver heavy use areas." Although vehicles will come within 200 ft. of cavity trees in these areas, training activity will adhere to the applicable Army RCW Guidelines (DA 1996).

5.3.8. DETERMINATION OF ANTICIPATED INCIDENTAL TAKE AT CLUSTER LEVEL

Cavity trees. As stated above, clusters were considered to be "taken" by cavity tree loss if cavity trees were removed, less than 4 suitable cavities remained and there was an insufficient number of suitable trees for artificial cavities to replace the lost cavities. Additionally, clusters were expected to be "taken" if 4 suitable cavities remained, but were separated from each other by the proposed action to an extent that they were not likely to be used by resident RCWs.

Foraging habitat. Foraging habitat was totaled as described above and was assessed according to the SMS as defined in the Recovery Plan (USFWS 2003a) and the modified, population-specific SMS developed with USFWS. The SMS "take" standard requires a minimum of 3,000 ft^2 of pine BA in stems $\geq$10 in. dbh on at least 75 acres of good quality foraging habitat that is contiguous to the cluster. The modified SMS differs only by the inclusion of stands with a minimum of 30 ft^2/ acre in pines ≥10 in. dbh. The minimum acreage required to meet 3,000 ft^2 of pine BA in stems $\geq$10 in. dbh varied depending on the average stand BAs within each partition, but was between 75 and 100 acres.

Clusters that did not meet the modified SMS criteria post-MCOE were expected to be "taken." Clusters that contained sufficient habitat using the modified standard, but did not meet the SMS as defined in the Recovery Plan, were further evaluated to assess group fitness and productivity. If demographic data showed a cluster had contained a PBG for 5 consecutive years, or at least the last 3 years in the case of newly activated recruitment clusters, the cluster was not expected to be "taken" at the cluster level. However, if a cluster had not been demographically stable for the last 5 years, a "take" determination was made.

As stated above, pine stem and basal area data for clusters within and adjacent to the A20 Impact Area was unavailable. If the cluster was not below the minimum standards for acreage standards when forested acres were considered, this partition was not considered an anticipated "take."

Harassment. Clusters were expected to be "taken" due to harassment impacts if, because of the proposed action, there would be <4 trees with suitable cavities *not* subjected to harassment impacts as defined in Section 5.4.7. Additionally, harassment "takes" were expected in clusters where >4 suitable cavities remained, but remaining cavity trees were isolated from one another as a result of proposed actions.

5.4. GROUP LEVEL ANALYSES

Retaining sufficient foraging habitat alone does not ensure the persistence of an RCW group. The continued occupation of a cluster not only depends on the amount of foraging habitat, but also depends on the density of active clusters around it (Hooper and Lennartz 1995). Research has shown that the more aggregated RCW clusters are, the higher the probability of persistence, even with substantial foraging habitat loss (Crowder et al. 1998, Letcher et al. 1998). RCW groups in moderately dense to dense populations have been shown to be less sensitive (i.e., group size and productivity) to drastic loss in habitat than in sparser populations with seemingly more available foraging habitat (Hooper and Lennartz 1995). Therefore, when active RCW clusters are to be "taken" for a project, it is necessary to assess the impact of that loss on the demographic stability of neighboring RCW groups. This is done by examining the density of active RCW clusters on the landscape.

For the group density analyses in this document, clusters having ≥4.7 active clusters within 1.25 miles were considered healthy and were given a "dense" designation. Clusters with 2.6 to 4.6 active clusters within 1.25 miles were considered to have "moderate" density. Clusters with ≤2.5 active clusters within 1.25 miles were considered "sparse," and therefore more vulnerable to abandonment because of lack of emigration/ immigration (Conner and Rudolph 1991a).

A 1.25 mile radius buffer was drawn around the cluster center for every active cluster within 0.5 mile of a project's clearing limits, adjacent to a cluster "taken" (direct or indirect) or affected by MCOE projects (some foraging habitat or cavity trees removed). For each cluster analyzed, the number of active clusters within 1.25 miles of its cluster center was calculated. All clusters with a cluster area (minimum convex polygon of all cavity trees and a 200 ft. buffer around them) within 1.25 miles of the target cluster's center were included in the cluster density

totals. These totals did not include the subject cluster if it was expected to be "taken" by a MCOE project. However, "taken" clusters were included in the pre-project density totals of their neighboring clusters.

Clusters with ≥4.7 active groups within 1.25 miles post-project were considered to be unaffected by the associated project or suite of projects. Clusters whose densities were reduced from "dense" or "moderate" to "sparse" were considered to be affected and therefore vulnerable to abandonment as a result of the proposed project(s). Clusters that were "sparse" pre-MCOE were generally considered to be "taken," particularly if project-related habitat removals caused the subject cluster to become more isolated and thus more vulnerable to abandonment.

Incidental Take was issued for 8 RCW clusters adjacent to the DMPRC in 2004 (Fort Benning 2005, USFWS 2006c). Although no clusters have been abandoned yet as a result of the timber clearing and construction of the ranges, these clusters were not included in group density and neighborhood-level analyses (S. Tucker, USFWS, pers. comm.). The A20 and K15 Impact Area clusters were also not included in group density calculations since they are covered under an Incidental Take Statement (USFWS 2002).

5.5. NEIGHBORHOOD LEVEL ANALYSIS

Guidance set forth by the USFWS (USFWS and NMFS 1998) states that "when determining an action area, it must include the project site and all the areas surrounding the activity up to where the effects will no longer be felt by the listed species." The intent of the "neighborhood analysis" is to account for the potential negative impacts of a project on RCW demography through habitat loss or fragmentation at the neighborhood level.

Prior to completion of the Transformation Biological Assessment, a 2.57 mile buffer was drawn around every active RCW cluster impacted by Transformation projects (USACE 2007b). This distance is the average successful dispersal distance based on 11 years of demographic monitoring by the FBCB (Michael Barron, Fort Benning, pers. comm.). The Neighborhood Analysis first looked at the density of RCW groups within a 1.25 mile radius of clusters that were not directly affected by projects, but were adjacent to clusters that were impacted. If the post-project analysis showed less than 2.5 groups within a 1.25-mile radius of the subject cluster, it was considered "taken".

5.6. POPULATION LEVEL ANALYSIS

Per recent USFWS guidance (USFWS 2006e), all projects are to be analyzed at the population level, regardless of whether or not there is an Incidental Take at the partition level. The Population Level Analysis considers the ability of Fort Benning to meet its RCW population goal (351 potential breeding pairs (PBGs), 421 total managed clusters) post-Transformation.

After subtracting all partitions expected to be "taken" at the partition, group and neighborhood levels, the remaining clusters were analyzed for fragmentation and reduction of productivity and dispersal. The fragmentation and reduction of productivity and dispersal analyses were more subjective because there are no set criteria.

In order to determine the amount of contiguous acreage pre- and post-MCOE, stands that were isolated from any other pine-dominated stands by >200 ft. were excluded from the acreage totals. The only exception was if an assemblage of stands was separated by >200 ft., but together contained sufficient habitat to support at least 1 cluster (150 acres). More detailed population analyses to be completed for the Final Biological Assessment and during formal consultation for this action will determine if these areas could support clusters that would contribute to recovery (see Section 8.3.4).

5.7. RECOVERY UNIT LEVEL ANALYSIS (JEOPARDY ANALYSIS)

The jeopardy analysis occurs at the Recovery Unit level (USFWS 2003a, USFWS 2006e). According to the 1998 USFWS Consultation Handbook (USFWS and NMFS 1998), when determining jeopardy, the USFWS is to analyze the impact of the action in question on the species as a whole. To facilitate this analysis, Recovery Units can be identified in a species' Recovery Plan that will provide a smaller-scale definition of Jeopardy. According to the 2003 Recovery Plan (USFWS 2003a):

> "Given that actions that appreciably impair or preclude the capability of such a recovery unit from providing the survival and recovery functions identified for it in a recovery plan may therefore represent jeopardy to the species, the Consultation Handbook indicates the jeopardy standard may be applied to individual recovery units identified as necessary for survival and recovery of the species in an approved final recovery plan."

Each Recovery Unit described in a species' Recovery Plan has a defined role in the downlisting, delisting and 'recovery' of the species. If an action is determined to jeopardize the ability of that Recovery Unit to serve the function described for it in the species' Recovery Plan, that action could be found to jeopardize the recovery of the species.

For the Sandhills Recovery Unit, the Recovery Plan (USFWS 2003) lists 2 Primary Core Populations (Fort Benning and North Carolina (NC) Sandhills East), 1 Secondary Core Population (SC Sandhills) and 1 Essential Support Population (NC Sandhills West). The Recovery Unit Level Analysis, focuses on the ability of Fort Benning to retain its function as 1 of the Primary Core Populations in the Sandhills Recovery Unit post-MCOE.

The Recovery Unit is discussed in Section 6.8.8, however, the jeopardy analysis will be conducted by the USFWS. This analysis will be based upon information provided in this Biological Assessment for the other 4 levels of analyses.

6. FEDERALLY PROTECTED SPECIES CONSIDERED

This Biological Assessment evaluates the potential impacts of the proposed MCOE actions on species listed as Threatened or Endangered, or proposed for such listing, by the USFWS pursuant to Section 7 of the ESA, as amended (Table 6-1) that occur on Fort Benning or have been recorded in the surrounding region. The subject species are relict trillium, Michaux's sumac, purple bankclimber mussel (*Elliptoideus sloatianus*), shiny-rayed pocketbook (*Lampsilis subangulata*), gulf moccasinshell (*Medionidus penicillatus*), oval pigtoe (*Pleurobema pyriforme*), wood stork and the RCW. Also, as of 15 November 2007, there is designated Critical Habitat for the shiny-rayed pocketbook on Fort Benning along Uchee Creek in Russell County, AL (Federal Register, 50 CFR Part 17).

The alligator is designated as Similarity of Appearance to a Threatened Taxon throughout its entire range under provisions of the ESA, as amended (USFWS 1987) due to its similarity to other Endangered species of crocodiles and caimans. USFWS regulates the legal trade of skins, or products made from them, in the commercial trade (Fort Benning 2001). Because the alligator is listed in order to regulate trade to prevent illegal "take" of other listed crocodilians, the species is biologically recovered and there is no import/ export aspect to the proposed action, potential project impacts to the alligator were not assessed (52 FR 107) (S. Tucker, USFWS, pers. comm.).

Bald eagles (*Haliaeetus leucocephalus*) 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) and the Migratory Bird Treaty Act (16 U.S.C. 703-712). Impacts to eagles were also not assessed for the proposed action.

Federal species of concern and State-listed species, including the gopher tortoise (*Gopherus polyphemus*), will be addressed in the Environmental Impact Statement for this project.

In determining the overall effect to Federally-listed species, the Installation considered direct, indirect and cumulative effects. The USFWS Consultation Handbook (USFWS and NMFS 1998) defines **direct effects** as "the direct or immediate effects of the project on the species or its habitat" (e.g., removal of a RCW cavity tree or foraging habitat). **Indirect effects** are "caused by or result from the proposed action, are later in time, and are reasonably certain to

Table 6-1. Federally-listed species potentially occurring in west-central Georgia.

Scientific Name	Common Name	Federal Status	State Status
PLANTS			
Rhus michauxii	Michaux's sumac	E	E
Trillium reliquum	relict trillium	E	E
BIRDS			
Mycteria americana	wood stork	E	E
Picoides borealis	red-cockaded woodpecker	E	E
REPTILES			
Alligator mississippiensis	American alligator	T/SA	
MUSSELS			
Elliptoideus sloatianus	purple bankclimber	E	E
Lampsilis subangulata	shiny-rayed pocketbook	E, CH	E
Medionidus penicillatus	gulf moccasinshell	E	E
Pleurobema pyriforme	oval pigtoe	E	E

Key: E = Endangered
T = Threatened
T/SA = Threatened/ Similarity of Appearance
CH = Critical Habitat designated on Fort Benning

Sources: USFWS 2008; GA DNR 2008; 15 November 2007 *Federal Register*, 50 CFR Part 17.

occur" (e.g., delayed mortality of RCW foraging habitat resulting from soil disturbance) (USFWS and NMFS 1998). Potential direct or indirect effects of projects (both alternatives) are described below. Cumulative effects are assessed in Section 7 of this document.

6.1. RELICT TRILLIUM (ENDANGERED)

6.1.1. BIOLOGY

A perennial herbaceous member of the lily family, relict trillium is distinguished from other sessile-flowered trilliums by its decumbent or S-curved stems, distinctively shaped anthers and shape of its leaves. Greenish to brownish purple and yellow flowers appear in early spring and the fruit is an oval-shaped, berry-like capsule which matures in early summer. After the fruit matures, the plant dies back to a tuberous rhizome (Patrick et al. 1995, USFWS 1990).

Relict trillium is found in SC, GA and AL in mature, moist, undisturbed hardwood forests that are usually fire-suppressed and in alluvial sands to rocky clays with a high organic content in their upper layer. Relict trillium sites are threatened by logging, industrial forestry, road construction, agricultural site conversion and residential and industrial development. Many known sites are close to expanding urban areas. Stone quarrying has adversely impacted at least 1 population. Japanese honeysuckle (*Lonicera japonica*) and kudzu (*Pueraria montana var. lobata*) are encroaching on relict trillium at many known locations (USFWS 1990).

Some priority recovery goals described in the species' Recovery Plan (USFWS 1990) include: (1) determining habitat protection priorities and developing landowner agreements, (2) planning and implementing necessary management techniques, (3) defining the criteria for what constitutes a self-sustaining population and determining the size of area each population needs to be self-sustaining, (4) reestablishing populations within suitable habitat and, (5) maintaining a cultivated source of plants and providing for long-term seed storage.

6.1.2. STATUS WITHIN THE ACTION AREA

6.1.2.1. Status on Fort Benning

Status. There are 5 populations of relict trillium being monitored on Fort Benning (Figure 6-1). There are other small groups or subpopulations known to exist on Fort Benning, but no active monitoring is in place for these groups at this time.

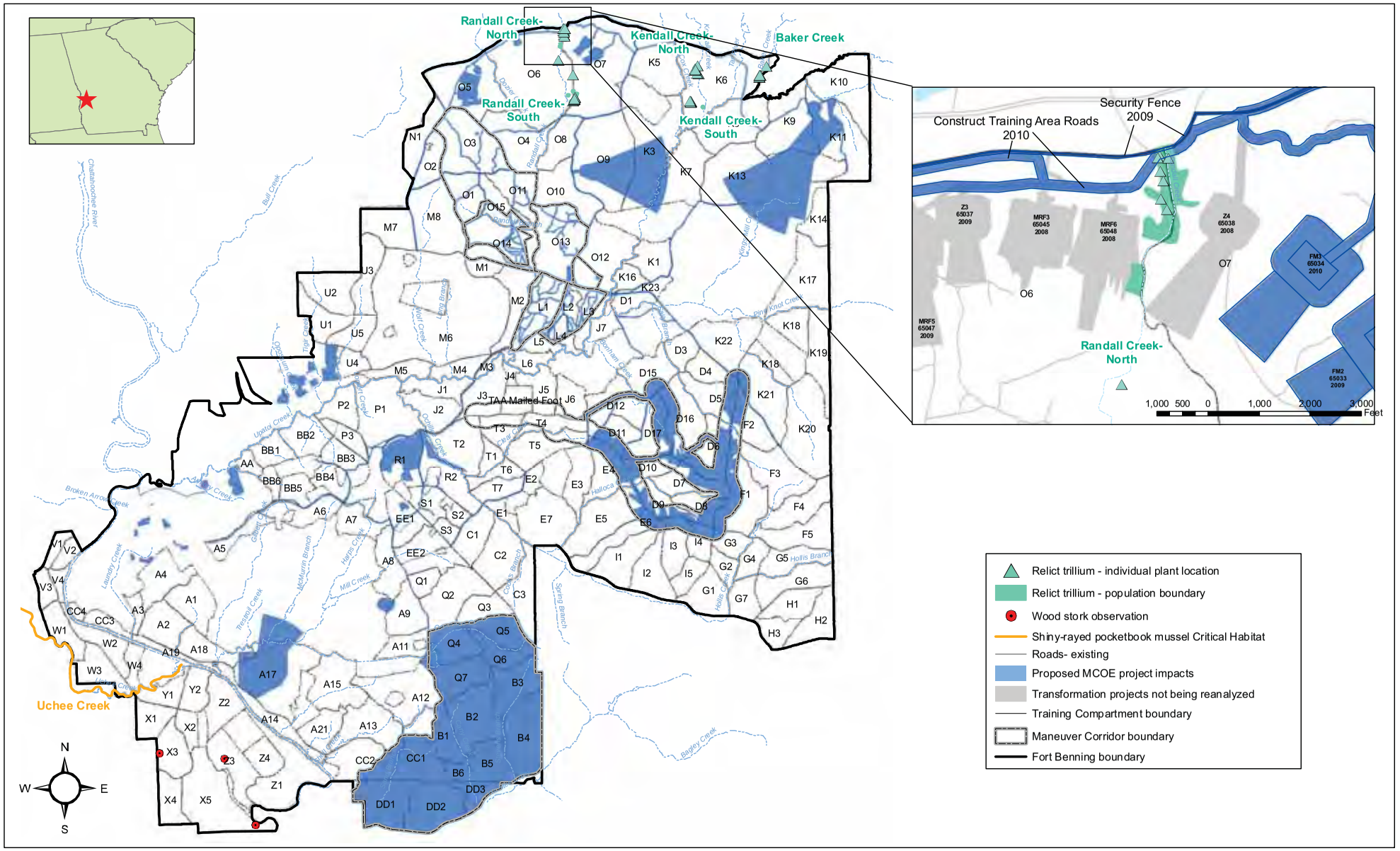


Figure 6-1. Known Federally-listed species locations on Fort Benning and potential project impacts by the proposed Alternative A (Preferred Alternative) MCOE actions at Fort Benning.

As described in Section 2.3.11, construction of MRF 6 (PN 65048) required transplanting 3 relict trillium plants from the Randall Creek North population to just north of the Baker Creek population on Fort Benning in the summer of 2008 (R. Thornton, Fort Benning, pers. comm.).

Monitoring. The 5 monitored populations are designated as Baker Creek (covering an approximately 2.34-acre area in Training Compartment K6), Kendall Creek North (approximately 11.79 acres, Compartment K6), Kendall Creek South (approximately 3.31 acres, Compartment K6), Randall Creek North (approximately 22.29 acres, Compartment O6) and Randall Creek South (approximately 14.54 acres, Compartment O7). Monitoring for these populations is conducted during the peak of flowering, which generally occurs in March and April. Each population contains 5, 1-square meter plots. Data collected at each plot include the age class, species and reproductive status of every *Trillium* sp. in the plot; an assessment of canopy cover; and any pertinent habitat condition information such as feral swine (*Sus scrofa*) damage, browsing by animals, signs of flooding, soil erosion or invasive plant species present. These plots are marked by 2 pieces of 0.5 inch reinforced bar extending approximately 2.5 ft. above the ground (Fort Benning 2004b).

Threats. Threats to relict trillium on the Installation include damage from feral swine, soil erosion, training impacts, damage during timber operations, encroachment of invasive plant species such as Japanese honeysuckle and kudzu, and damage from fire. Feral swine have been observed in Compartment K6, where 3 of the 5 trillium populations occur. To protect the trillium from swine damage, the Baker Creek, Kendall Creek South and the Kendall Creek North populations have been completely fenced. Feral swine are not currently considered to be a threat at the remaining locations, however, data collected during annual monitoring will indicate if additional fencing is necessary.

Management and Protection. In order to protect plants from human disturbance, the 5 populations have been designated as Sensitive Areas and are marked by signs posted along population boundaries. The following additional management measures are in place to protect relict trillium from various types of disturbance (Fort Benning 2001):

- Fencing populations from feral swine where necessary
- Prohibiting timber harvesting within 200 ft. of the population boundary
- Prohibiting digging and vehicles within the sensitive area signs posted around each population

• Prohibiting prescribed burning within the posted boundaries of each population

• Controlling the feral swine population by trapping or shooting. There is no bag limit on feral swine on the Installation; in fact, hunters can currently present evidence of hogs killed to receive a monetary reward (Fort Benning 2008h).

6.1.2.2. Status Off-Post

Relict trillium has been found by TNC on 2 private parcels adjacent to Fort Benning, one of which is now under a conservation easement with TNC (see Section 3.2). Relict trillium has also been found in the greater Fort Benning area on private lands in Harris County, GA, Lee County, AL and Tallapoosa County, AL (W. Harrison, TNC, pers. comm.).

6.1.3. SURVEY RESULTS

Five known populations and 2 known isolated individual plants were confirmed on Fort Benning during the USFS surveys (Figures 5-1 and 6-1) (USFS 2006).

Approximately 2,012 additional acres on Fort Benning were surveyed for relict trillium in April and May 2008 by JCA. A few Trillium individuals were found in the Good Hope area that could not be identified. It is unlikely that these are relict trillium because of soil type, but species identification will be verified in spring 2009.

6.1.4. POTENTIAL PROJECT IMPACTS

Potential direct impacts to relict trillium include damage to plants by timber harvesting, ground disturbance and/ or project construction, as well as the loss of canopy cover. Two proposed MCOE projects will impact the 22.29-acre Randall Creek North population. Population density is highly variable, therefore it is unknown how many plants will be damaged; plants that will be translocated will be marked and counted during Trillium growing season.

The Infrastructure Support, Incr. 2 (PN 67457) (FY 2009) security fence will impact the Randall Creek-North relict trillium population (Figure 6-1). This will require clearing of a 40 ft. right-of-way along Chattsworth Rd. on the northern edge of the Installation. This will impact up to 0.23 acre of the 22.29-acre population.

The proposed new asphalt administrative road (PN 65554) (FY 2009) traversing the northeastern edge of the Installation and associated bridge over Randall Creek will also impact

the Randall Creek-North relict trillium population. Impacts were assessed at 96 ft. from the road centerline, and total an additional 1.11 acres (Figure 6-1).

Plants that cannot be avoided during fence or road construction may be relocated to a recipient site on Fort Benning or to a recipient site on Georgia Department of Natural Resources (GA DNR) property in order to establish or enhance off-Post relict trillium populations (R. Thornton, Fort Benning, pers. comm.).

Potential indirect effects include limitations on access and game management. The training schedules along with new and current range SDZs could limit monitoring and management at the trillium sites, such as applying herbicide in order to control competing invasive plants. Additionally, feral hogs are a constant threat to trillium populations. Some populations are fenced to prevent hog damage, but others are not. The current levels of authorized hunting and additional population control by FBCB personnel are barely enough to keep the hog population "in check" (R. Thornton, Fort Benning, pers. comm.). With access becoming more difficult, increasing feral hog populations and damage to unfenced trillium populations could become an issue.

An additional concern is that any land clearing/ construction disturbance increases the possibility of introducing invasive exotic species or aiding in the spread of such species. This could be detrimental to a trillium population (R. Thornton, Fort Benning, pers. comm.).

A related issue is a condition termed "edge effect." As forested lands are cleared, areas that were once forest interior will become the edges of openings. In general, vegetation on the edge of clearings is considerably denser than vegetation in the adjacent forest interior. The increased sunlight and increased probability of disturbed soils cause stand edges to be more susceptible to encroachment from exotic species such as kudzu, Japanese honeysuckle and Chinese privet (*Ligustrum sinense*), as well as aggressive native early-successional plants.

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 per the Georgia National Pollution Discharge Elimination System (NPDES) and Air Rules.

6.1.5. BIOLOGICAL DETERMINATION

May Affect, Likely to Adversely Affect

6.2. MICHAUX'S SUMAC (ENDANGERED)

6.2.1. BIOLOGY

Michaux's sumac is a low-growing, densely pubescent, rhizomatous shrub that can grow to 3 ft. tall. Each compound leaf has from 9 to 13 sessile, oval or oblong, toothed leaflets, with the terminal leaflet borne on a winged petiole approximately 0.75-inch long. Small greenish-yellow to white flowers are borne in dense, erect, terminal clusters in June and red, fleshy fruits, covered by short hairs and containing a single large seed, are borne on female plants August to October (USFWS 1993). This species is most easily identified during the peak growing season from June to September.

In general, this species occurs in sandy or rocky open woods, sometimes in association with circumneutral soils. It is dependent upon some form of disturbance to maintain the open character of its habitat. Historically, periodic fires provided that disturbance. Currently, Michaux's sumac survives in areas that are artificially disturbed, such as highway and railroad rights-of-way, edges of cultivated fields and other cleared areas (NatureServe 2006), in addition to regularly burned longleaf pine woodlands.

Major threats to Michaux's sumac are (1) fire suppression, (2) degradation of habitat by conversion to other uses including agriculture, silviculture, commercial and residential development, road construction and mechanized military training, (3) hybridization with other *Rhus* species, (4) geographic isolation of small populations, (5) fungal disease and (6) stem borers. The species is shade intolerant and declines in vigor when its habitat becomes fire suppressed and a dense mid- or overstory develops (NatureServe 2006).

Michaux's sumac was listed as endangered in 1989. In the species Recovery Plan it is listed as extirpated in Muscogee County, GA (USFWS 1993). Two populations are currently known in Georgia, Elbert County - 154 miles to the northeast and Newton County - 90 miles to the northeast (USFWS 1993).

6.2.2. STATUS WITHIN THE ACTION AREA

Michaux's sumac 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 there is no Installation management plan for this species.

6.2.3. SURVEY RESULTS

The USFS conducted a survey for Michaux's sumac within areas of suitable habitat within the Threatened and Endangered species survey area in 2006, but no plants were observed (USFS 2006).

Approximately 7,600 additional acres were surveyed for Michaux's sumac in 2007 by JCA (see Section 5.1.3). No Michaux's sumac was seen during the surveys.

6.2.4. BIOLOGICAL DETERMINATION

No Effect

6.3. PURPLE BANKCLIMBER (THREATENED)

6.3.1. BIOLOGY

The purple bankclimber is a large, heavy shelled mussel up to 8 inches in length. The shell is iridescent and the nacre color is whitish near the center, becoming purple towards the margins (USFWS 2003b). In 1998, it was Federally listed as Threatened in AL, FL and GA (USFWS 2003b). It is found in the Apalachicola-Chattahoochee-Flint River Basin (ACF Basin) and in the Ochlockonee River. Channel maintenance, dredging and impoundments are a threat to the species (NatureServe 2006).

6.3.2. STATUS WITHIN THE ACTION AREA

There are no known occurrences on Fort Benning or the Action Area (Brim Box and Williams 2000). Agriculture, forestry, impoundments and siltation have impacted the Chattahoochee River and its tributaries, leading to unsuitable mussel habitat on Fort Benning (USFWS 2006d). Fort Benning plans to design bridges, culverts and fords for future road crossings for the prevention of further erosion or siltation. Soil Erosion Control Plans will be developed for these projects and NPDES permits will be obtained and implemented.

One purple bankclimber was found in 2000 and again in 2001 in the Chattahoochee River northwest of the Installation and outside of the Action Area in Lee County, AL and Harris County, GA (USFWS 2006d).

6.3.3. SURVEY RESULTS

Surveys were conducted by the USFWS in May and June of 2006 at 27 pre-determined stream locations on Fort Benning (Figure 5-1). Only 2 native mussel species were found, which were in Dozier and Cox Creeks. The purple bankclimber was not found (USFWS 2006d).

6.3.4. BIOLOGICAL DETERMINATION

No Effect

6.4. SHINY-RAYED POCKETBOOK (ENDANGERED)

6.4.1. BIOLOGY

This species is a medium-sized mussel up to 3.3 in. in length. The shell is subelliptical with a rounded posterior edge. It has a smooth and shiny shell, light yellowish brown in color, with bright emerald green rays across the length of the shell (USFWS 2003b). In 1998, it was Federally listed as Endangered in AL, FL and GA (USFWS 2003b). It is found in the Chipola River and Uchee Creek in AL. Threats include agricultural and silvicultural runoff (NatureServe 2006).

6.4.2. STATUS WITHIN THE ACTION AREA

There are no known occurrences of the shiny-rayed pocketbook within the Action Area, although it has been observed in Uchee Creek west of the Installation (Brim Box and Williams 2000). Agriculture, forestry, impoundments and siltation have impacted the Chattahoochee River and its tributaries, leading to unsuitable mussel habitat on Fort Benning and surrounding areas (USFWS 2006d). Fort Benning plans to design bridges, culverts and fords for future road crossings for the prevention of further erosion or siltation. Soil Erosion Control Plans will be developed for these projects and NPDES permits will be obtained.

The shiny-rayed pocketbook has designated Critical Habitat along 21.2 miles of Uchee Creek, from its confluence with the Chattahoochee River upstream to Island Creek in Russell County, AL (Federal Register, Department of the Interior, USFWS, 50 CFR Part 17, 15

November 2007). On Fort Benning, Uchee Creek flows along or through Compartments W1, W3, W4 and Y1 (Figure 6-1). No past USFWS consultations were affected by this designation, and none of the proposed projects are in the vicinity of Uchee Creek. Fort Benning will include an ESMC for this Critical Habitat in its next INRMP revision (R. Thornton, Fort Benning, pers. comm.).

6.4.3. SURVEY RESULTS

Surveys were conducted by the USFWS in May and June of 2006 at 27 pre-determined stream locations on Fort Benning (Figure 5-1). Only 2 native mussel species were found during the surveys, which were in Dozier and Cox Creeks. The shiny-rayed pocketbook was not found (USFWS 2006d).

6.4.4. BIOLOGICAL DETERMINATION

No Effect

6.4.5. BIOLOGICAL DETERMINATION FOR CRITICAL HABITAT

No Effect

6.5. GULF MOCCASINSHELL (ENDANGERED)

6.5.1. BIOLOGY

This small mussel reaches a length of 2.2 in. The shell is smooth and yellowish, to greenish brown, with fine, usually interrupted green rays. It is elongate-elliptical or rhomboidal in outline, inflated and has relatively thin valves (USFWS 2003b). In 1998, it was Federally listed as Endangered in AL, FL and GA (USFWS 2003b). It is found in 24 subpopulations in 6 different watersheds, located in the Sawhatchee and Kirkland Creeks in the Chattahoochee River system; Whitewater, Little Pennahatchee, Swift, Muckalee, Kinchafoonee and Chickasawhatchee Creeks in the Flint River system; the Flint and Chipola Rivers; Big, Baker and Waddell's Mill Creeks in the Chipola River system and Econfina Creek system (USFWS 2003b). Sedimentation and absence of its specific host fishes (blackbanded (*Percina nigrofasciata*) and brown darters (*Etheostoma edwini*)) are a threat to this species (NatureServe 2006).

6.5.2. STATUS WITHIN THE ACTION AREA

There are no known occurrences of gulf moccasinshell within the Action Area (Brim Box and Williams 2000). Agriculture, forestry, impoundments and siltation have impacted the Chattahoochee River and its tributaries, leading to unsuitable mussel habitat on Fort Benning and surrounding areas (USFWS 2006d). Fort Benning plans to design bridges, culverts and fords for future road crossings for the prevention of further erosion or siltation. Soil Erosion Control Plans will be developed for these projects and NPDES permits will be obtained.

6.5.3. SURVEY RESULTS

Surveys were conducted by the USFWS in May and June of 2006 at 27 pre-determined stream locations on Fort Benning (Figure 5-1). Only 2 native freshwater mussel species were found, which were in Dozier and Cox Creeks. The Gulf mocassinshell was not found.

6.5.4. BIOLOGICAL DETERMINATION

No Effect

6.6. OVAL PIGTOE (ENDANGERED)

6.6.1. BIOLOGY

The oval pigtoe is a small to medium-sized mussel up to 2.4 in. in length. The shell is suboviform, compressed and shiny smooth, yellowish, chestnut or dark brown in color, rayless, but with distinct growth lines (USFWS 2003b). In 1998, it was Federally-listed as Endangered in AL, FL and GA (USFWS 2003b). It occurs in the Chipola, Ochlockonee, Flint, Chattahoochee and Suwannee River systems and the ACF Basin. Threats include siltation, pollution and watershed development (NatureServe 2006).

6.6.2. STATUS WITHIN THE ACTION AREA

There are no known occurrences on Fort Benning or within the Action Area. Agriculture, forestry, impoundments and siltation have impacted the Chattahoochee River and its tributaries, leading to unsuitable mussel habitat on Fort Benning and surrounding areas (USFWS 2006d). Fort Benning plans to design bridges, culverts and fords for future road crossings for the prevention of further erosion or siltation. Soil Erosion Control Plans will be developed for these projects and NPDES permits will be obtained.

6.6.3. SURVEY RESULTS

Surveys were conducted by the USFWS in May and June of 2006 at 27 pre-determined stream locations on Fort Benning (Figure 5-1). Only 2 native freshwater mussel species were found, which were in Dozier and Cox Creeks. The oval pigtoe was not found (USFWS 2006d).

6.6.4. BIOLOGICAL DETERMINATION

No Effect

6.7. WOOD STORK (ENDANGERED)

6.7.1. BIOLOGY

The wood stork is a distinctive migratory, wetland bird found primarily in South America. It is the largest wading bird breeding in the US, standing 33 - 45 in. tall, and has a dark, featherless head and upper neck and white body plumage. It has a wingspread of 59-65 in., with iridescent black primary and secondary wing feathers and a black tail. During the early nesting season, adults have a pale salmon coloring under the wings, fluffy under-tail coverts and pink toes. The breeding range of the wood stork extends from the southeastern US through Mexico and South America. It nests in rookeries located in swamps and wetlands (USFWS 1996). The nearest nesting population to Fort Benning is in Thomas County, GA, approximately 115 miles southeast of Fort Benning (Fort Benning 2001).

The wood stork is a tactile feeder, capturing food by wading through water with its beak immersed and partially open (Coulter et. al. 1999). Although it can feed visually, tactile feeding allows it to forage in wetlands with concentrated prey, as well as in murky waters, without depending on sight. They most often feed on live prey, primarily fish, 1-10 in. in length.

Storks usually nest in bald cypress, swamp blackgum or red mangrove trees (*Rhizophora mangle*) on islands surrounded by open water or in standing water. Colony locations are used year after year, depending on habitat conditions. Roost sites are structurally similar to nest sites, yet include a wider variety of conditions. Use of nest and roost sites often depends on availability of foraging areas.

In south FL, extensive wetlands and high concentrations of prey during the dry season have historically supported large breeding colonies of this species. However, that population has

declined substantially since the 1960s as a result of water management practices and degradation of the Everglades (Coulter et. al. 1999). These changes have focused attention on this species as a bio-indicator of the health of the Everglades and other shallow wetlands region-wide (NatureServe 2006).

Restoration of the Everglades and Big Cypress systems are crucial for the recovery of the wood stork (USFWS 1996). Population declines of the wood stork in south FL have been balanced to some extent by increased stork migration into central and northern FL, NC, GA and SC (Rodgers 1996). The US breeding population of wood storks was listed as Endangered in 1984 (USFWS 1996). After breeding, individuals move northward as far as NC and as far west as MS and AL (USFWS 1996).

6.7.2. STATUS WITHIN THE ACTION AREA

6.7.2.1. Status on Fort Benning

Wood storks on Fort Benning are dispersing (post-breeding) birds and have a highly variable duration of stay. Most observations occur near the backwaters of the Chattahoochee River in Training Compartments X5 and Z3 (Figure 6-1). None were observed in 2005 and 3 were observed in Compartment X5 in 2006 (R. Thornton, Fort Benning, pers. comm.).

Changes in water levels caused by USACE regulation of the Chattahoochee River influence the availability of foraging habitat for the wood stork, which makes management on Fort Benning difficult. It is unlikely that wood storks will nest on Fort Benning due to the lack of seasonally drying wetlands that provide foraging habitat during the breeding season. There are several areas on the AL side of the Installation that have potential wood stork nesting sites if water levels are controlled.

According to Fort Benning's Wood Stork ESMP (Fort Benning 2001), the main conservation goal is to maintain habitat for wood storks during post-breeding dispersal, along with increasing public awareness and monitoring foraging and roosting areas. Training exercises in potential roost areas are rare, but if a military unit wants to train or construction activity is planned within feeding habitat, a FB Form 144-R to EMD must be submitted detailing military activity and location. Activities affecting the wood stork and its habitat are monitored and restricted (Fort Benning 2001).

6.7.2.2. Status Off-Post

Suitable nesting habitat for wood storks exists off-Post within the Action Area on the AL side of the Installation.

6.7.3. SURVEY RESULTS

Wood stork surveys were conducted in 2006 by the USFS, however, no wood storks were observed (USFS 2006).

The proposed action will not require the removal of any suitable wood stork roosting or nesting habitat and is not expected to alter dispersal behavior.

6.7.4. BIOLOGICAL DETERMINATION

No Effect

6.8. RED-COCKADED WOODPECKER (ENDANGERED)

6.8.1. BIOLOGY

The RCW is a small, non-migratory woodpecker endemic to mature, fire-maintained pine forests in the southeastern United States, where it was historically common. RCWs measure 7 to 8.5 in. long, have a black cap and nape, prominent white cheeks and a black-and-white, horizontally barred back. Adult males have red markings (cockades) behind the ear, but the cockades are difficult to see (USFWS 2003a).

RCWs are found in all southern and southeastern Coastal States from eastern Texas into southern Virginia, with small interior populations in southeastern Oklahoma, southern Arkansas (USFWS 2003a) and, until recently, south-central Kentucky (Mills et al. 2004). The largest populations are in the Coastal Plain forests of the Carolinas, FL, GA, eastern Texas, central Louisiana and in the Sandhills forests of the Carolinas (USFWS 2003a).

Ideal nesting habitat for RCWs includes open, mature southern pine forests dominated by longleaf pine, loblolly pine, pond pine (*P. serotina*), slash pine or other southern pine species greater than 60 years of age with an open midstory/ understory that is maintained by frequent fire. Potential foraging habitat is defined as open pine or pine/ hardwood stands 30 years of age or older (USFWS 2003a).

Nest/roost cavities are excavated into the heartwood of living pine trees that are typically over 60 years old. Older pines are necessary because they have sufficient heartwood to contain a cavity and because they are more likely to be infected with red-heart fungus (*Phellinus pini*), which substantially reduces the time required to construct a cavity (USFWS 2003a). The RCW excavates resin wells into the cambium above and below the cavity entrance, resulting in a resinous coating around the cavity. Cavity stages of completion are defined as starts (entrance tunnel constructed) or complete cavities: both are protected. Activity status can be defined as active (currently being maintained and/or used by a RCW), inactive (not used or maintained recently, but still suitable) or relic (start or cavity not maintained for >5 years, and/or unlikely to be utilized or reactivated by a RCW due to modification by other species).

An aggregate of cavity trees is called a cluster and may include 1 to 20+ cavity trees. A cluster is occupied by a group of RCWs; a group can be a solitary male or a non-breeding pair, but typically consists of a breeding male and female and often 1 or more helpers (typically male offspring from previous years). Helpers assist with cavity excavation and maintenance, 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 (Walters 1990, Jackson 1994).

Development of a dense understory may result in abandonment of cavity trees/clusters. Fire exclusion, conversion of forest lands to agricultural and other uses and logging have destroyed most of this species' habitat rangewide (USFWS 2003a).

The RCW Recovery Plan (USFWS 2003a) designated 13 Primary Core Recovery Populations, 12 of which will be inhabited by at least 350 PBGs at recovery and one of which will have ≥1,000 PBGs. Populations of this size should be able to withstand 4 of 5 general threats to RCW population viability: demographic stochasticity, environmental stochasticity, genetic drift and inbreeding. The fifth threat to population viability emphasized in the Recovery Plan is catastrophes such as hurricanes or southern pine beetle outbreaks (USFWS 2003a). Primary Core and Secondary Core Recovery Populations were selected, in part, to eliminate the risk of extinction of the species due to hurricanes, by ensuring that recovery populations are distributed throughout the RCW's range (USFWS 2003a). It has been estimated that at any given time, 1 or 2 recovery populations and a number of support populations will be recovering from hurricanes (Hooper and McAdie 1995).

6.8.2. STATUS WITHIN THE ACTION AREA

6.8.2.1. Status on Fort Benning

Fort Benning's RCW population is dispersed over most of the Installation, with the exception that there are no active clusters located in the AL portion (Figure 6-2).

Background. In September 1994, the USFWS issued a JBO to Fort Benning which concluded that 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 underway to enlarge the RCW management staff and to conduct management activities needed to remove the jeopardy status (Fort Benning 2004b).

In September 2002, the Service issued another BO based on the review of the Installation's RCW ESMP. The Service concurred with the RCW management strategies, Incidental Take determinations and other RCW analyses reported in the ESMP, and consequently terminated the JBO. The 2002 BO required ongoing management activities that are non-discretionary. However, these management actions are intended to minimize potential future impacts to RCWs rather than resolve actions that could jeopardize the species existence. Additionally, the 2002 BO (USFWS 2002) was the catalyst that allowed the Installation to adopt the 1996 Army RCW Guidelines (DA 1996). Prior to the 2002 BO, the Installation was using the 1994 Army Guidelines which were more restrictive for conducting training activities (Fort Benning 2004b).

Cluster Inspections and Management. Since 1994, RCW population demographics have been intensively studied, resulting in an extensive RCW population database. Of 307 clusters Fort Benning managed in 2008, 284 were active clusters. The managed clusters include all clusters on the Installation with the exception of inaccessible clusters in dudded impact areas (manageable clusters within impact areas are included in the 307 total). The 307 managed

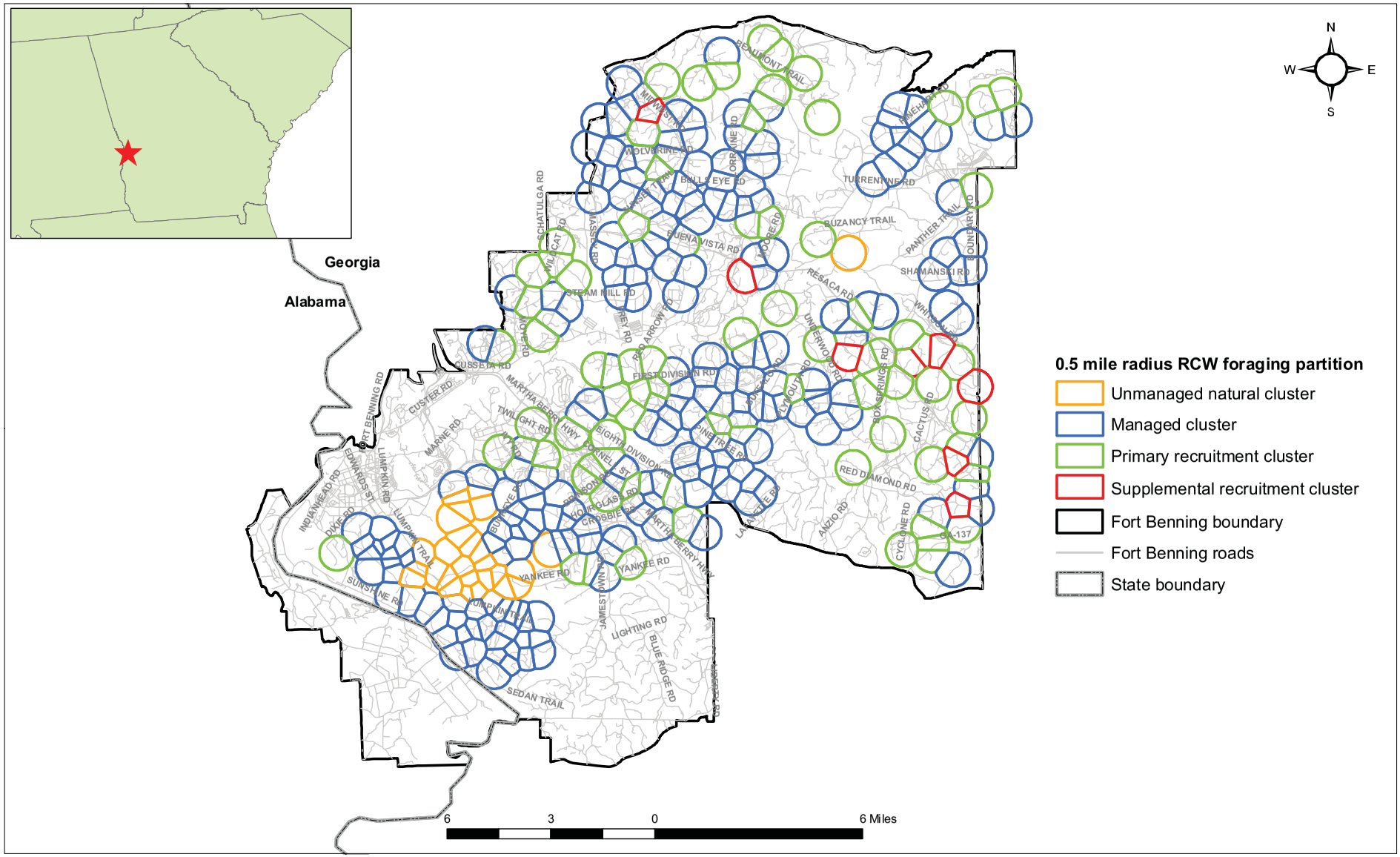


Figure 6-2. Distribution of red-cockaded woodpecker (RCW) clusters including unmanaged and managed natural RCW clusters and primary and supplemental RCW recruitment clusters, Fort Benning, Georgia and Alabama.

clusters include the 8 clusters that were considered to be "taken" by the DMPRC (USFWS 2004, Fort Benning 2005, USFWS 2006c) and 32 clusters that were "taken" by Transformation (USFWS 2007a). Although "taken," these clusters will continue to be managed according to the Army RCW Guidelines (DA 1996, 2007). Enough demographic data is collected at each managed cluster to determine the presence or absence of a PBG; all managed clusters inhabited by a PBG can be counted toward the Installation's RCW population goal (DA 1996, 2007) that are not included in a current Incidental Take Statement in a BO (J. Doresky, USFWS, pers. comm.).

All managed clusters are inspected every spring (March-April) and recruitment clusters are inspected again in the fall (September-October). During cluster inspections, RCW biologists and technicians record comprehensive data about the cavity trees, habitat within the cluster area and overall management concerns. Data collected includes the activity status and suitability of all cavities, damage to cavity trees or surrounding habitat (including military training impacts), any cavity maintenance or provisioning needed, erosion issues and habitat management needs within the cluster area (i.e., midstory control, invasive exotic species or timber prescription recommendations). Any new cavity or start trees found during nesting season are marked and entered into the RCW database (Fort Benning 2002, DA 1996).

Cavities are maintained or installed as needed in order to provide each managed cluster with at least 4 suitable cavities, per the 1996 Guidelines (DA 1996). Cluster areas are managed mechanically and/ or chemically as needed to keep the cluster area free of midstory (hardwood or pine) (Fort Benning 2002). Habitat problems outside of the cluster area, training impacts and/or erosion problems are communicated to the appropriate directorate for resolution.

Demographic Monitoring. Fort Benning also monitors and color-bands (bands) RCWs in at least 25% of all active clusters on the Installation (65 clusters). As the population increases, more clusters are added to maintain a 25% sample (Fort Benning 2002, DA 1996). The 1996 Guidelines (DA 1996) also require monitoring recruitment clusters for 5 years after becoming active, however, Fort Benning currently monitors RCWs at 84 recruitment clusters on the Installation, regardless of how long they have been active. RCWs at an additional 30 clusters have been monitored since 2003 as a minimization effort for the DMPRC (Fort Benning 2004b), and 16 more have been added as minimization for Transformation impacts, resulting in a total of 61% (188) of all 307 managed clusters being monitored for potential banding. In 2008, 17 of the

188 total clusters monitored for potential banding were inactive, therefore Fort Benning could have banded birds in 59% of the groups in active managed clusters (171 of 284). Activities at clusters where banding occurs include banding all nestlings and adults, identifying previously banded adults, determining fledgling success and determining the sex of fledglings (Fort Benning 2002, DA 1996).

Recruitment Clusters. According to the 1996 Guidelines (DA 1996), installations must add recruitment sites, within the limitations of available habitat, in order to achieve at least the optimum rate of population growth so as to meet individual population goals. Recruitment clusters created for this purpose are managed as Primary Recruitment Clusters (PRCs) and are subject to the same training restrictions and protection as natural/ preexisting RCW clusters (DA 1996). In 2008, Fort Benning had 104 clusters designated as PRCs and 85 were active (Figure 6-2). This total includes all protected clusters created for the purposes of attracting RCWs, although technically only those installed since the approval of the 1996 Guidelines on Fort Benning in 2002 (8 clusters) are defined as "PRCs". Under the 2007 Guidelines (DA 2007), all clusters subject to training restrictions, including PRCs, are referred to as "protected" clusters.

Additionally, Supplemental Recruitment Clusters (SRC) must be created, as available habitat allows, above and beyond the required number of PRCs. SRCs are not subject to any training restrictions and are "invisible to training" (trees are painted less conspicuously than PRCs), therefore they require an Incidental Take Statement. All SRCs were covered by Incidental Takes after approval of the ESMP (up to 15 groups) (USFWS 2002). This Incidental Take applies only to training impacts; no construction activities can be undertaken in these areas without additional consultation with the USFWS. In 2008, Fort Benning had 8 clusters designated as SRCs, all of which were active (Figure 6-2). Under the 2007 Guidelines, all clusters without training restrictions, including SRCs, are referred to as "unprotected" clusters (DA 2007).

When RCWs voluntarily move into a stand not previously designated as a recruitment site, the new cluster is designated as either a PRC or SRC depending on the military use of the area (DA 1996).

The Recovery Plan and 2007 Guidelines recommend a 5% average annual population growth in all RCW populations, to be achieved by providing a number of unoccupied recruitment clusters equal to 10% of the total number of active clusters (USFWS 2003a, DA

2007). In 2008, Fort Benning had 10 unoccupied recruitment clusters with 4 suitable cavities each, which is 3.5% of the number of active clusters on the Installation (284) (FBCB unpub. data). As described in Section 3.1.9, Fort Benning is limited in the areas that are suitable for new recruitment clusters due to a variety of management challenges.

Clusters within dudded impact areas. As described in Section 2.3, the BO on the 2001 RCW ESMP (USFWS 2002) provided an Incidental Take Statement for 41 groups in the dudded impact areas (29 known clusters and an estimated 12 unknown groups). RCW groups in 3 impact area clusters could be managed by Fort Benning and were not included in the Incidental Take Statement (USFWS 2002). As part of the DMPRC Biological Assessment and BO, an additional 11 clusters within the A20 Impact Area were brought under management (USFWS 2004, 2006c). FBCB is able to access these clusters 4 days per year per an agreement with FBRD, including at least 1 visit during the nesting season to document breeding status. This addition resulted in 14 managed impact area clusters that can contribute to the Installation RCW population goal.

The remaining unmanaged clusters in dudded impact areas are accessed whenever possible to gather data and/or conduct management as time allows (the frequency of access to these areas is highly variable).

Population Growth. The first comprehensive cluster inspections were completed between 1990 and 1992, although cavity trees have been marked with white paint since 1980 and have had metal numeric tags since 1982. The extent of information gathered was extremely limited by today's standards, but the 1990-1992 data revealed 171 active and 57 inactive clusters. When monitoring began in 1994, there were 174 active clusters (Doresky et al. 2004). In July 2008, the number of managed clusters had increased to 307, consisting of 271 PBGs, 1 solitary RCW, 5 captured clusters and 23 inactive clusters (FBCB unpub. data) including clusters previously taken but still managed (see above).

The 2003 Recovery Plan recommends an annual increase of 5% in the total number of active clusters (USFWS 2003a). Additionally, according to the 1996 Army Guidelines (DA 1996), any installation having a 5% 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% decline in total active clusters either from the previous year or over a 5 year period (DA 2007). The Fort Benning RCW population showed a 2.5% increase in active clusters and a 3.4%

increase in the number of PBGs between 2007 and 2008. Since 2003, the RCW population has shown steady growth and averaged 2.5% increase in active clusters and 4.1% increase in the number of PBGs per year (FBCB unpub. data).

Surveys. Surveys for new RCW cavity trees on Fort Benning are scheduled so that 100% of potential RCW nesting habitat on the Installation is surveyed every 10 years or 10% of the Installation is surveyed each year (M. Barron, Fort Benning, pers. comm.). In order to fulfill survey requirements for Transformation and MCOE actions, surveys from 2006 to date have been targeted to the areas potentially impacted by proposed projects (see Section 5.1).

Additionally, prior to any timber harvest or significant land-disturbing activity, the project site and a 0.5 mile radius around it are surveyed for new cavity trees. As new cavity trees are marked, cluster buffers are adjusted according to their level of protection (natural cluster, PRC or SRC) (DA 1996).

Translocation. Fort Benning is a valued participant in the USFWS RCW Southern Range Translocation Cooperative (SRTC). Since 1998, it has donated 10-16 juvenile RCWs per year to supplement other RCW populations (M. Barron, Fort Benning and R. Costa, USFWS, pers. comm.). In 2007, Fort Benning donated 3 pairs of hatching-year RCWs to the Chickasawhay Ranger District, DeSoto National Forest, Mississippi and 3 pairs and 1 hatching-year male to Enon Plantation, AL, a private quail plantation that was recently enrolled in the AL Safe Harbor Program. Prior to the establishment of the SRTC, Fort Benning also donated 1 bird to the Daniel Boone National Forest, KY (Table 6-2 and Figure 6-3).

Role of Fort Benning in RCW Recovery. Fort Benning's RCWs population is designated as 1 of 13 Primary Core Recovery Populations by the USFWS (2003). Primary Core Populations by definition will contain at least 350 PBGs at recovery (USFWS 2003a). However, as part of the minimization for the Land Exchange, the Army committed to supporting 1 additional PBG at Fort Benning for recovery. The Fort Benning RCW population is part of the Sandhills Recovery Unit, which is a narrow band stretching from Fort Benning northeast to just north of the Fort Bragg Military Reservation in NC (Figure 6-4). Recovery Units are distinguished by, and named for, the ecoregions in which they fall. Ecoregions are classified by physiographic characteristics such as land formation, climate, air and sea currents and distribution of species. Since these factors are believed to have influenced genetic adaptations over time, it is thought that by preserving species such as the RCW in each of its natural ecoregions, most of its genetic

Table 6-2. Recipient populations of birds donated by Fort Benning from 1996-2007.

		Role in Recovery	Male	Female	**Total**
1996:	Daniel Boone National Forest, KY	Secondary Core	0	1	**1**
1999:	International Paper, Southlands Experiment Forest, GA	Significant Support	3	7	**10**
	Joseph W. Jones Ecological Research Center, GA	Significant Support	3	3	**6**
2000:	International Paper, Southlands Experiment Forest, GA	Significant Support	3	3	**6**
	DeSoto Ranger District, DeSoto National Forest, MS	Secondary Core	3	3	**6**
	St. Marks National Wildlife Refuge, FL	Primary Core	2	1	**3**
2001:	International Paper, Southlands Experiment Forest, GA	Significant Support	2	2	**4**
	Chickasawhay Ranger District, DeSoto National Forest, MS	Primary Core	1	1	**2**
	Blackwater River State Forest, FL	Secondary Core	2	1	**3**
	Joseph W. Jones Ecological Research Center, GA	Significant Support	1	1	**2**
2002:	Avon Park Air Force Range, FL	Essential Support	3	1	**4**
	International Paper, Southlands Experiment Forest, GA	Significant Support	1	1	**2**
	Chickasawhay Ranger District, DeSoto National Forest, MS	Primary Core	1	1	**2**
2003:	Shoal Creek Ranger District, Talladega National Forest, AL	Essential Support	2	3	**5**
	DeSoto Ranger District, DeSoto National Forest, MS	Secondary Core	2	3	**5**
2004:	Conecuh National Forest, AL	Secondary Core	3	3	**6**
	Wetappo Creek Conservation Area, FL	n/a	3	1	**4**
	Chickasawhay Ranger District, DeSoto National Forest, MS	Primary Core	3	3	**6**
2005:	Conecuh National Forest, AL	Secondary Core	2	2	**4**
	Shoal Creek Ranger District, Talladega National Forest, AL	Essential Support	3	4	**7**
	Hal Scott Preserve, FL	Essential Support	0	2	**2**
	St. Sebastian Buffer Preserve, FL	Essential Support	0	1	**1**
2006:	Shoal Creek Ranger District, Talladega National Forest, AL	Essential Support	3	3	**6**
	DeSoto Ranger District, DeSoto National Forest, MS	Secondary Core	3	6	**9**
2007:	Enon Plantation, AL	n/a	4	3	7
	Chickasawhay Ranger District, Desoto National Forest, MS	Primary Core	3	3	6
		TOTALS	56	63	**119**

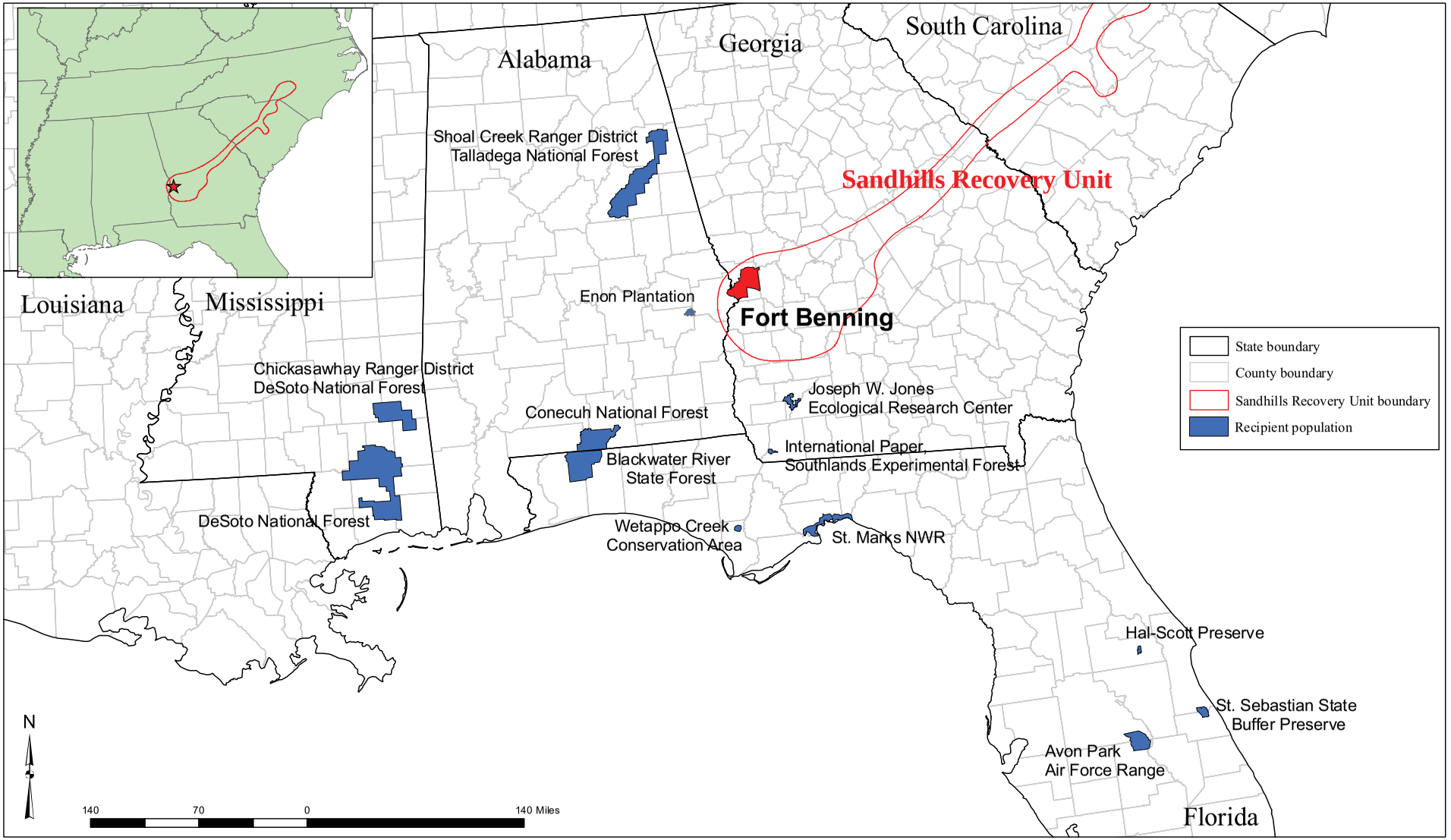


Figure 6-3. Location of recipient populations of red-cockaded woodpeckers (RCW) donated by Fort Benning.

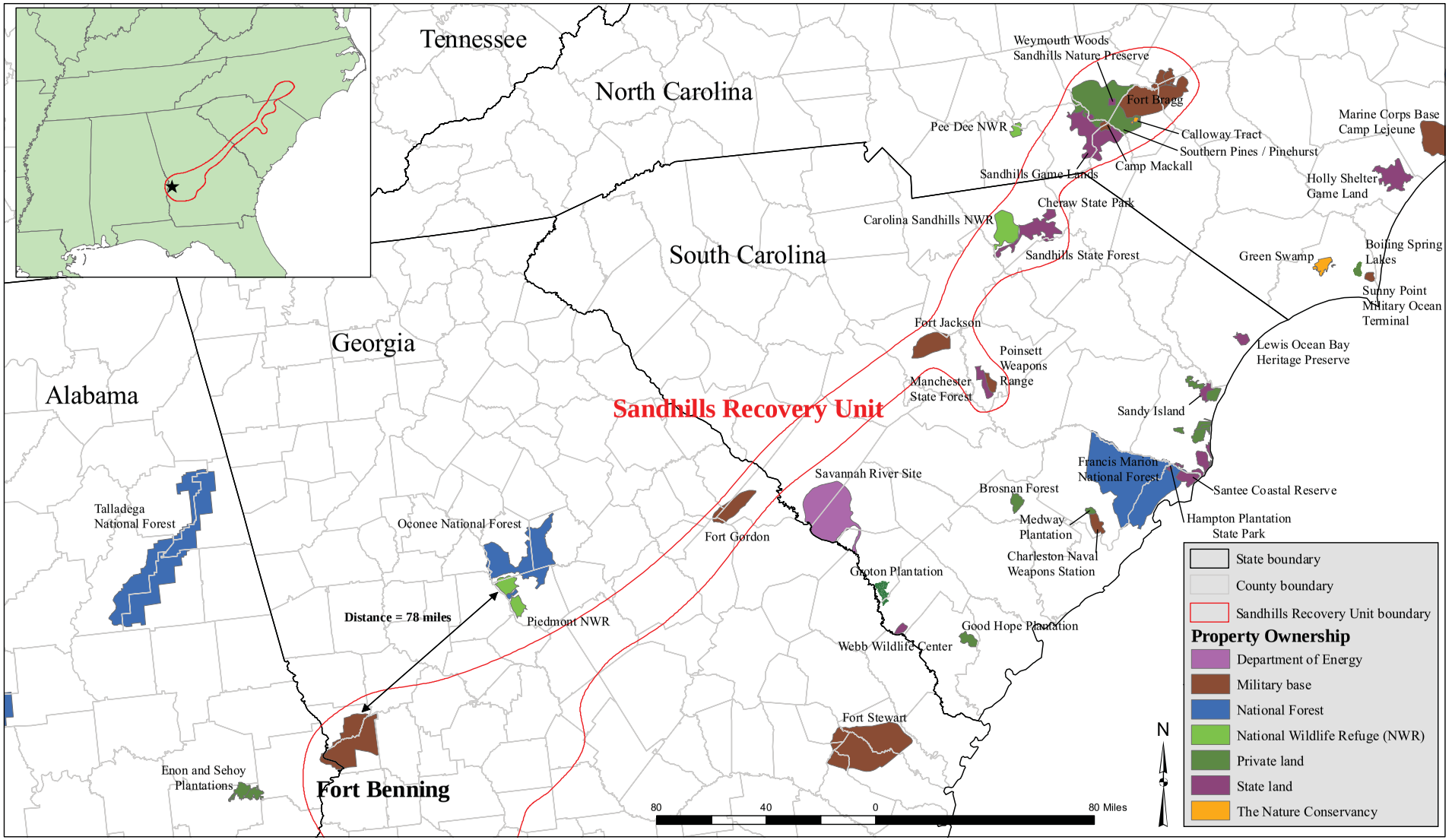


Figure 6-4. Location of red-cockaded woodpecker (RCW) populations within the Sandhills Recovery Unit (USFWS 2003a). This map also shows the distance between the Piedmont National Wildlife Refuge RCW population and Fort Benning.

variations will be preserved. Maintaining populations in all ecoregions is crucial for the long-term viability of the species (USFWS 2003a).

While some core populations are comprised of RCW groups on multiple ownerships and locations within a geographic area, the nearest off-property RCW recovery population to Fort Benning is approximately 78 miles east northeast of Columbus at the Piedmont National Wildlife Refuge/ Oconee National Forest (Secondary Core) (USFWS 2003a). In the 13 years of monitoring at Fort Benning, only 4 dispersals have been documented from off-Post: 1 from the Piedmont National Wildlife Refuge/ Oconee National Forest population, 1 from Fort Gordon (approximately 170 miles) and, in 2008, 2 from the Silver Lake Tract, which was recently acquired by GA DNR as part of Southlands Forest (approximately 100 miles) (M. Barron, Fort Benning, pers. comm.). In addition, 1 RCW that was banded on Fort Benning dispersed and was observed on the Enon-Sehoy Plantation in 2008.

In order to be considered a genetically connected population, 1-10 immigrants are needed per generation (approximately 4 years for RCWs) (Reed et al. 1988), each way, in order to be sufficient to prevent loss of genetic polymorphism and heterozygosity within subpopulations (Mills and Allendorf 1996, Walters et al. 2004). Birds that have moved must survive to breed successfully. Because of the lack of significant exchange of genetic material between Fort Benning RCWs and clusters off the Installation, Fort Benning is the sole landowner contributing to the aptly named Fort Benning Primary Core Population.

There are also 4 known active RCW clusters on Enon Plantation and 2 active clusters on Sehoy Plantation, which are 20-30 miles west of Fort Benning (Figure 6-4). These properties do not have a recovery role defined in the Recovery Plan and will therefore not contribute to the species' delisting (USFWS 2003a). However, portions of these properties will be protected in perpetuity and are enrolled in the AL RCW Safe Harbor Program. There are also anecdotal accounts of other clusters in the region. The Army, USFWS, TNC and other organizations have a common interest in preserving undeveloped land between Fort Benning and Enon/ Sehoy Plantations in order to increase the long-term stability of the Fort Benning Primary Core Population. The logistics and details of this initiative, such as feasibility of landowner incentives for endangered species management on private lands, are currently being discussed amongst the above-listed organizations.

6.8.2.2. Status Off-Post

The only known occurrence of an active RCW cluster within the off-Post Action Area is on the MTP, adjacent to the northwestern corner of the Installation. Although the majority of its foraging habitat was removed by winter 2005 (see Section 2.6), this "taken" cluster contained a PBG in 2007.

6.8.3. POTENTIAL PROJECT IMPACTS

Specific impacts of individual projects are listed under Section 6.8.4 and cumulative effects are assessed in Section 7 of this document. Potential direct or indirect effects of projects which were considered for analysis are listed below. The type of potential effect and, where applicable, Incidental Take, is indicated. Incidental Take of RCWs resulting from the proposed action may be under the definition of harass, harm, kill, wound or combinations thereof.

6.8.3.1. Loss of RCW cavity trees

Clearing and project construction (direct or indirect- harm). Some RCW cavity trees will be removed in order to construct cantonment projects, roads or ranges. There is also potential for cavity tree mortality due to unintentional impacts from soil erosion and/ or compaction from timber operations or construction activities.

Operation and maintenance (direct or indirect- harm). There is also potential for cavity tree mortality after project construction due to impacts from live fire (accounted for in range "beaten areas"), accidental damage to tree boles from vehicles, soil compaction (root damage) or sedimentation from maneuver training exercises.

Cavity trees were considered lost where impact avoidance and/or adherence to Army RCW Guidelines were deemed infeasible; these impacts are described in Section 6.8.4. The risk of all other potential cavity tree impacts will be minimized by following Army RCW Guidelines, maintaining a 200 ft. buffer and cavity trees in the maneuver heavy use areas (described in Section 4.7.3) and via measures described in Sections 8 and 9 (DA 1996, DA 2007).

Impacts to cavity trees will be minimized by avoiding trees during design (Section 8.1) where possible and following compliance protocols (e.g., soil erosion control (Sections 8.4 and 8.5).

6.8.3.2. Loss of RCW foraging habitat

Clearing and project construction (direct- harm). Detrimental effects on certain RCW groups will be caused by clearing of foraging habitat (pine stands over 30 years old) within associated RCW foraging partitions or from mortality related to construction staging areas and/ or timber operations. In addition, large clear-cuts (≥25 acres) are known to negatively affect RCW fitness, dispersal and foraging behavior either through direct habitat loss or habitat fragmentation (Conner and Rudolph 1991a, Ferral 1998, Jackson and Parris 1995, Rudolph and Conner 1994, USFWS 2003a, Kappes and Walters, pers. comm.).

Operation and maintenance (indirect- harm). Foraging habitat within RCW partitions (pine stands over 30 years old) may experience mortality due to live fire and/or maneuver exercises, which could have detrimental effects on the affected RCW groups.

The acreage of foraging habitat that was reasonably certain to be lost over time was subtracted from the affected clusters' foraging habitat totals in Section 6.8.4. All other potential foraging habitat impacts will be minimized via adherence to the Army RCW Guidelines (DA 1996, DA 2007) and minimization measures described in Sections 8 and 9. Depending on which properties are available, off-post conservation of lands adjacent to the Installation proposed in Section 9 could help to offset this effect.

6.8.3.3. Noise and harassment

Clearing and project construction (direct- harass). The use of heavy equipment, increased traffic on infrequently used roads and an increase in human activity from timber clearing operations and project construction could have a "harassment" impact on RCW groups in the area (Delaney et al. 2002. 2004, Hayden et al. 2002, Walters et al. 2005, Perkins 2006). This is of particular concern if active RCW cavity trees occur within 200 ft. of the activity, especially during the nesting season. Disturbance around cavity trees can cause RCWs to flush from their cavities and, if the disturbance continues or there is insufficient daylight, to open-roost. This leaves RCWs unprotected from environmental hazards such as inclement weather and predators. Disturbances can also result in increased flushing while incubating eggs and reduced brooding and feeding of nestlings, which can lead to nest failure (Delaney et al. 2004, USFWS 2003a, 2006b, J. Walters, NC State University, unpublished report). Clusters with active cavity trees

within 200 feet of project construction limits or range beaten areas were assessed for harassment impacts. These impacts are evaluated in the cluster summaries in Section 6.8.4.

Operation and maintenance (direct- harass). In addition to the effects listed above, live fire, maneuvering, other training exercises and pedestrian and vehicular traffic in areas that are currently infrequently used could have a detrimental "harass" effect on local RCW groups. This is of particular concern for RCWs using cavity trees within 200 ft. of the activity, especially during the nesting season.

Over the past 30 years, several research projects have assessed the potential effects of military noise, primarily from large-caliber ranges and artillery simulators, on certain elements of RCW fitness (Jackson and Parris 1995, Doresky et al. 2001, Pater et al. 1999, Delaney et al. 2002, Hayden et al. 2002, J. Walters, NC State University, unpublished report). Generally, the results of these works have demonstrated that noise events (particularly those historic and relatively constant) from military activities have little to no effect on RCW reproductive success. The majority of these studies, however, used RCW groups that were located on or adjacent to established ranges and had likely become acclimated to disturbance. The effects of newly introduced noise and associated cumulative disturbances are not yet to be definitively understood, particularly for large projects or disturbances. Delaney et al. (2004) found that RCWs did not flush from their nests when artillery simulators or 0.50 caliber blank fire were fired >500 ft. away. Of the 3 large caliber ranges proposed (MPMG2, MPTR and ST2), all cavity trees within 500 ft. of the range edges were within the limits of construction and were already considered removed.

Recent research suggests that military training (e.g., heavy maneuver training or light infantry) and/ or civilian activity in the vicinity of RCW clusters may affect RCW behavior by causing more frequent flushing during incubation and/ or less frequent feeding of nestlings, which can cause a reduction in nest success or the number of young fledged. In the populations studied, however, such disturbances did not conclusively have a detrimental effect on overall population health or demography (Hayden et. al. 2002, Delaney et al. 2004, 2002, Perkins 2006). In one study, only a very small proportion of the clusters studied (3 of 51) was found to have a high risk of exposure to military training. This sample, however small, revealed lower nesting and fledgling success than clusters studied with less frequent activity. A model used in this study suggested that the population's probability of extinction would increase if a larger

proportion of the Installation were subject to "high" military/ civilian activity, (Hayden et. al. 2002). Fort Benning has contracted Dr. Tim Hayden with the Engineer Research and Development Center (ERDC) to conduct similar research evaluating the potential effects of Transformation and MCOE activities on the Fort Benning RCW population (see Section 8.3.5).

Unless otherwise indicated, all proposed construction and training activities will adhere to the applicable Army RCW Guidelines (DA 1996, DA 2007): harassment impacts were assessed in areas where training or construction could not adhere to the Guidelines. Training restrictions established in the 1996 Army RCW Guidelines (Table 2-5) were retained in the 2007 Guidelines, largely with the justification that training impact studies to date have not shown a negative impact from training on overall population health or stability: activities that adhere to these guidelines do not appear to cause long-term adverse effects on RCW demography (USFWS 2007b, Hayden et. al. 2002, Perkins 2006, Beaty et. al. 2004).

It should be noted, however, that the studies mentioned above were conducted on installations with "average" training loads. Large-scale, intense maneuver training such as that proposed for Fort Benning was not considered in the development of the Army Guidelines because no such training existed on installations with RCWs at that time (T. Hayden, USACE Construction Engineering Research Laboratory, pers. comm.). As described under Section 4.7.2, most training courses within the Maneuver Areas will be repeated between 11 and 23 times a year, with up to 50% of the training conducted at night (Table 4-3). This disturbance will be neither historic nor constant. Although RCWs may become acclimated over time, training could initially result in nest failures or cause birds to open-roost. For this reason, harassment impacts were also assessed in areas where adherence to the Guidelines may not be sufficient to prevent adverse impacts in the Cluster Level Analyses (Section 6.8.4).

6.8.3.4. Sediment loading

Construction of projects near RCW cavity trees or foraging habitat could cause sediment loading on tree roots, potentially causing tree mortality (indirect- harm). Of greater concern is the off-road heavy maneuver training expected with the proposed MCOE actions, which has the potential to cause sediment loading on the roots of RCW cavity trees and trees used for forage trees or erosion exposing roots, potentially causing tree mortality.

Of the 84,925 acres of heavy maneuver lands that are available for heavy maneuver training, including the Good Hope Maneuver Area and areas under range SDZs, and excluding dudded impact areas and restricted areas, at least 51,035 acres are on highly erodible soils (NRCS GIS data, also used in Fort Benning 2001) (note: erodible soils data was not available for Training Compartments DD1-3 within the Good Hope Maneuver Area). Northeast of Hwy. 27-280, 73,826 acres are available for heavy maneuver, of which 44,074 acres (59.7%) are on highly erodible soils.

This potential impact was captured in impact analyses by assuming 100% degradation of habitat over time in the off-road heavy maneuver areas. Soil erosion minimization measures described in Section 8 will help minimize the risk of erosion/ sedimentation impacts, and monitoring that will be included in the Range and Training Land Assessment Installation Management Plan will allow Fort Benning to be proactive in this effort. Also, much effort is being made to harden trails, construct concrete turn pads and install water crossings in the Maneuver Areas to minimize erosion issues.

6.8.3.5. Reduction of RCW cluster density

Any of the impacts listed may result in an Incidental Take of a RCW group. Such "take" can, in turn, indirectly affect surrounding RCW groups. As described in Sections 5.5 and 5.6, the distribution and density of RCW clusters on the landscape is a key factor in the overall stability and health of a RCW population. Reducing cluster density causes populations to be more vulnerable to demographic stochasticity (Crowder et. al. 1998, Walters et. al. 2002b). This potential impact is captured under the group and neighborhood level analyses as "takes" by the definition of harm.

6.8.3.6. RCW habitat fragmentation

Also related to the density and distribution of RCW clusters is habitat contiguity (Conner and Rudolph 1991, Ferral 1998, Jackson and Parris 1995, Rudolph and Conner 1994, USFWS 2003a), which is important at the foraging partition-level as well as at the landscape-level. Areas of unsuitable RCW habitat ≥200 ft. wide can inhibit an individual group's ability to utilize foraging habitat within its partition and may inhibit the ability of RCWs to disperse from their natal territory to vacant breeding niches. Territory isolation by habitat fragmentation decreases

the likelihood of clusters being inhabited by PBGs because dispersing females often fail to locate solitary males or find the territories substandard. This problem is a function of the number and spatial arrangement of active clusters.

Home range follows and radio telemetry work conducted via Virginia Polytechnic Institute have indicated that female RCWs of any age are reluctant to cross openings between 492 and 2,132 ft., and will not cross openings of >2,132 ft. Male RCWs are not as affected by forest gaps (J. Walters, VA Tech, pers. comm.).

Large introduced forest gaps can also cause surrounding stands to become susceptible to wind damage.

The largest sites to be cleared will be for the ST2, the MPMG and the MPTR. The potential fragmentation impacts of these and other proposed actions on RCW dispersal are analyzed under the group and neighborhood level analyses as "takes" by the definition of harm, as well as in the population level analyses.

This potential impact will be minimized to some extent by preserving as much habitat within the range limits of construction as possible (Section 9.1.2). Off-post conservation could offset this effect to an extent as well, if habitat is available to bolster otherwise narrow strips of habitat along the Installation boundaries.

RCW demographic modeling to be conducted for the proposed action described in Section 8.3.4 will evaluate the effect of fragmentation on the Fort Benning RCW population.

6.8.3.7. Reduction of habitat quality/ population health

One of the purposes of the analyses at the group and neighborhood levels is to assess how the proposed action will indirectly affect the demographic health of the Fort Benning RCW population. Loss, degradation or fragmentation of foraging habitat can result in smaller clutch sizes, reduced fledging success and reduced group size as habitat becomes insufficient (Conner, and Rudolph 1991a).

Demographic monitoring proposed in Section 9.4 will address this issue.

6.8.3.8. Edge effect

A related fragmentation issue is a condition termed "edge effect." As more forested lands are cleared, areas that were once forest interior will become the edges of openings. In

general, vegetation on the edge of clearings is considerably denser than vegetation in the adjacent forest interior. The increased sunlight and increased probability of disturbed soils cause stand edges to be more susceptible to encroachment from exotic species such as kudzu, Japanese honeysuckle and Chinese privet (*Ligustrum sinense*), as well as aggressive native early-successional plants. Such species typically do not carry fire well, and when burned, the edge is often burned less severely, resulting in limited woody plant mortality. This problem is exacerbated when the edge is a road, building or other urban development where prescribed fire is prohibited. The edge effect poses a problem to RCW management by increasing midstory density in foraging and nesting habitat.

An additional problem associated with forest edges or developed areas is increased cavity competition with kleptoparasites such as southern flying squirrels (*Glaucomys volans*), European starlings (*Sturnus vulgaris*), eastern bluebirds (*Sialia sialis*), red-headed woodpeckers (*Melanerpes erythrocephalus*) and red-bellied woodpeckers (*Melanerpes carolinus*). Large gaps and forest edges and have been noted to cause an increase in the number of avian predators (Jackson and Parris 1995) and could lead to increased predation opportunities.

Impacts of this nature are indirect and are captured in the Population Level Analyses with fragmentation issues.

6.8.3.9. Disturbance and removal of groundcover

In areas with substantial ground disturbance, particularly in the Heavy Maneuver Areas and the Vehicle Recovery Area, there may be too little groundcover and pine straw to carry a fire. It is unknown what effect the absence of fire and severely reduced groundcover will have on arthropod abundance and, in turn, RCW forage availability. While hardwood midstory encroachment should not be a problem in heavy traffic areas, it may be in the "islands" of habitat that remain within the maneuver trail networks. This indirect effect is captured by considering the off-road heavy maneuver areas to be 100% lost over time in the Cluster Level Analyses.

6.8.3.10. Elimination of existing and planned RCW recruitment sites

Fort Benning does not have many areas that are currently suitable for additional recruitment sites. Because the locations of recruitment sites are primarily based on habitat conditions, the location of adjacent clusters and the overall population goal of the Installation, all

future recruitment sites have not been mapped. However, the RCW ESMP does establish a population goal for each compartment in order for the Installation to meet recovery. Therefore, any MCOE projects removing pine habitat, regardless of whether or not the removal is currently within a RCW foraging partition, could restrict or prohibit the associated compartment from supporting the number of clusters designated in the ESMP (Fort Benning 2002), thereby inhibiting the Installation's ability to meet recovery. This potential indirect effect is assessed in the Population Level Analyses.

Although foraging habitat losses were not assessed for existing inactive clusters, cavity tree removals and impacts within 200 ft. were assessed in the Cluster and Population Level Analyses. Loss of recruitment sites and inactive clusters may cause Fort Benning to have fewer than the recommended number of available unoccupied clusters (10% of the number of active clusters) needed to achieve the desired 5% annual population growth for the foreseeable future (DA 1996, USFWS 2003a).

This impact will be minimized as much as practicable by avoiding cavity trees during design (Section 9.1).

6.8.3.11. Potential for delayed population growth and recovery

The Fort Benning RCW population recovery goal (USFWS 2003a) was determined by assuming that all suitable upland pine and pine-hardwood habitat was filled with RCW recruitment clusters (i.e., carrying capacity). Therefore, as occupied clusters and vacant recruitment clusters are eliminated or abandoned, either by loss of cavity trees or foraging habitat or isolation, the amount of time necessary to recover the RCW within the Fort Benning boundary will be increased. Included in this effect is the loss of pine plantations planted for the purpose of RCW recovery- loss of young pine plantations will, in effect, "set the clock back." This delay is discussed in the Population Level Analysis as an indirect effect of the proposed action.

A demographic model being utilized for the proposed action will assess Fort Benning's ability to meet recovery (351 PBGs) and will determine the timeframe in which recovery could be achieved (Section 8.3.4.). Results of this model should be available to the USFWS during formal consultation for the proposed action.

6.8.3.12. Live-fire through foraging areas

Trees downrange of firing points and outside of range footprints will remain in their present structure and density (excluding limits of construction) to act as a buffer for the surrounding area. Over time, however, these trees will incur some degree of mortality from fired munitions hitting or shearing trees, either directly or from ricochet. As trees die there will be less of a buffer, potentially allowing ordnance to travel further and thereby expanding the areas of impact. For the purposes of quantifying this potential tree mortality, the areas that FBRD personnel expected to experience the most damage were delineated as "beaten areas" for each range (Appendix E). Since foraging habitat will be lost over time, this could result in an indirect "take" by harm.

Although not highly likely, "take" of RCWs in the form of wound or kill could also result from live fire through foraging areas.

Berms proposed for small arms ranges in Section 9.8 will reduce this impact and will maximize the amount of potential foraging habitat available south of the Oscar Small Arms Complex.

6.8.3.13. Access for timber management, RCW management, prescribed fire and wildfire control

The arrival of the new troops will result in a substantial increase in the number of field training exercises and ranges being active on any given day (see Section 4.3.5). With existing ranges being used more often, new ranges becoming operational and increased activity and/ or concentration of Armor, Cavalry and Infantry units conducting FTXs, access to many areas by FBLMB and FBCB will become more limited and will require close coordination with FBRD. Management concerns include, but are not limited to, timber thinning, hardwood understory or midstory control, RCW cavity maintenance, installation of artificial cavities, banding and monitoring of RCWs during the nesting season, collecting foraging habitat or timber cruise data, prescribed burning and response to wildfires. In the training areas, the main issues will be scheduling access to conduct the above identified management requirements in order to avoid conflict with active range SDZs and training exercises. In the cantonment areas, access for prescribed burning will be a challenge because of safety concerns due to smoke and lack of visibility near new buildings and roads.

Fort Benning personnel are operating under the assumption that throughout and beyond the duration of the Transformation and proposed MCOE actions access will be available to manage all (remaining) managed RCW clusters according to 1996 and 2007 RCW Guidelines (DA 1996, 2007) criteria (e.g. documenting breeding status, maintaining 4 suitable cavities and midstory control).

Plans to address potential scheduling problems are described in Sections 8 and 9.

6.8.3.14. Loss of RCW cavity trees due to wildfires

Related to the above-listed issues, the increased number and use of ranges may increase the number of wildfires from training exercises. Contributing to this potential problem are restricted access for FBLMB personnel responding to fires, potentially fewer prescribed burns in areas under SDZs and restricted preventative management by FBCB and FBLMB including the lack of careful preparation and burning around RCW cavity trees. Loss of cavity trees due to wildfire would be an indirect effect of the proposed action that could potentially destroy ("harm" or "kill") cavity trees, habitat, nests and/ or kill nestlings.

The RCW ESMP and resulting BO allow for the annual loss of up to 5 active cavity trees as a result of training exercises (USFWS 2002), however to date, none have been lost. For this reason, no additional cavity tree losses due to wildfires are expected from, or requested for, this action.

6.8.3.15. Effects of Minimization Efforts

As with any timber operations, extensive habitat management within RCW partitions such as thinning and hardwood midstory control has the potential to have a temporary "harass" impact on resident RCWs. However, research has shown that even sudden and extensive midstory removal and pine thinning does not typically result in cluster abandonment (Conner and Rudolph 1991b). All timber operations to improve RCW habitat as part of the proposed action will follow the standard timber operation protocols found in Section 8, which include efforts to minimize RCW impacts.

Substantial additional demographic monitoring is proposed to document the effectiveness of the proposed minimization measures in Section 9. While such monitoring provides data that is crucial to the recovery of the species, it can have unintentional detrimental impacts to RCWs,

including injury or death of nestlings or adults while noosing, capturing or banding (direct-harm). Flushing adults from cavities for visual examination of cavities and/ or banding nestlings can also disturb nesting, feeding, incubating and/or brooding schedules, possibly resulting in nest failures or nestling death (direct-harm or harass). All of these potential impacts were evaluated in a BO for the Section 10(a)(1)(A) endangered species permitting program, and annual Incidental Take was estimated to occur during 0.30% of all monitoring activities conducted for injuries and 0.40% of all activities for mortalities (USFWS 2003c).

All monitoring activities require permitting from the USFWS and GA DNR, and any direct or indirect effects resulting from properly conducted monitoring would be covered under the permitting BO (USFWS 2003c). Additionally, any research proposed in Sections 8 and 9 which could affect RCWs will require appropriate permitting from USFWS and GA DNR.

6.8.3.16. Impact to Minimization Efforts From Past Section 7 Consultation

The proposed action has the potential to interfere with minimization for past projects such as the DMPRC and Transformation by "taking" clusters monitored as minimization. This potential indirect effect is assessed in Section 6.8.4.

6.8.3.17. Loss of Fort Benning as a RCW Donor Population

Fort Benning typically supplies 10-16 RCWs to the SRTC annually. This voluntary contribution has benefited numerous RCW populations. The proposed action will reduce the number of RCWs Fort Benning is able to donate annually. If this deficit is not covered by other RCW donor populations, it could indirectly impede the growth of other populations in the SRTC. Of the 15 properties Fort Benning has donated RCWs to since 1996, 11 have a designated role in recovery (Primary Core Populations, Secondary Core Populations and Essential Support Populations) (USFWS 2003a) (Table 6-2).

All translocations must be approved by the USFWS RCW Recovery Coordinator. Depending on the extent of habitat loss and fragmentation on Fort Benning from the Transformation and proposed MCOE actions, Fort Benning, together with USFWS, will determine the extent that the Installation can continue to participate in the SRTC. Some or all of the birds typically available for donation may be needed for intrapopulation translocation in order to help offset losses caused by the proposed action.

Fort Benning has participated in the USFWS RCW SRTC as a donor population since 1998. One of the goals of this initiative is to increase both the size and growth rate of RCW populations across the Southeast on private, state, and Federal properties in order to expedite recovery, thereby helping to minimize conflicts between RCWs and military activities (USFWS 2007). The proposed action, however, has the potential to greatly reduce the number of RCWs Fort Benning is able to contribute annually, which could indirectly impede the growth of other RCW recovery populations. Since participation in the SRTC is a discretionary conservation action, the Installation cannot be "penalized" for reducing its contributions as a result of the proposed action. The impact of the proposed action, however, on those RCW populations that would otherwise be supplemented with Fort Benning RCWs does warrant recognition. These recipient populations are listed in Table 6-2 and are shown in Figure 6-3. The primary recipient populations since 1998 have been International Paper's Southlands Forest in GA; Shoal Creek Ranger District, Talladega National Forest in AL; and the DeSoto and Chickasawhay Ranger Districts, DeSoto National Forest in Mississippi.

In 2007, Fort Benning donated 6 RCWs to Chickasawhay Ranger District and 7 RCWs to Enon Plantation, a quail plantation approximately 30 miles west of Fort Benning in Russell and Bullock Counties, AL (Table 6-2, Figure 6-3). Planned translocations for 2008 include 1 pair to Sehoy Plantation (adjacent to Enon Plantation) and 5 pairs to DeSoto National Forest (M. Barron, Fort Benning, pers. comm.).

6.8.4. CLUSTER LEVEL ANALYSES

6.8.4.1. Pre- project Cluster Status and Foraging Habitat, Project Impacts and Post- project Foraging Habitat Totals

RCW cavity trees and/ or foraging habitat will be impacted in 121 active and 12 inactive RCW clusters as a result of Alternative A 2009-2012 MCOE projects (Tables 6-3, 6-4 and Appendices G, H and I). In 2008, 119 of these clusters contained PBGs, 1 contained a solitary male and 1 site was a captured cluster (Table 6-5).

FHAs were completed for 120 active clusters (project impacts to 1 active cluster were in non-contiguous habitat and an FHA was not conducted). Pre- project, 36 of the 120 (3%) analyzed active clusters did not meet the SMS and 118 clusters (98%) did not meet the RS. Data

for pre- project cluster status and foraging habitat are presented in Tables 6-3 and 6-4, Figures 6-5 - 6-10 and Appendices G, H and I.

Impacts of projects are summarized below by the fiscal year of construction initiation. Projects which impact RCW partitions are presented for the 4 cantonment areas (Harmony Church, Kelley Hill, Main Post and Sand Hill), 3 range areas northeast ("North") and southwest ("South") of Hwy. 27-280, the Northern Maneuver Area and the Southern Maneuver Area. Data for the following project impacts are presented in Tables 6-3 and 6-4, 6-5 - 6-11, Figures 6-4 - 6-9 and Appendices G and H.

Post- project, 55 of the 120 active RCW clusters (46%) did not meet the SMS (Table 6-3) and will be directly "taken" by the Alternative A projects. Forty-one clusters will be "taken" by loss of foraging habitat only, 14 clusters will be taken by both loss of foraging habitat and cavity trees and 1 cluster will be taken only as a result of cavity tree removals. One hundred and nineteen clusters (99%) did not meet the RS post- project. Data for the following post- project discussion are presented in Tables 6-3 - 6-4, Tables 6-12 - 16, Figures 6-11 - 6-16 and Appendices G, H and I. See Sections 6.8.5 and 6.8.6 for Group and Neighborhood Level impacts.

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 A. 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 under Alternative A (FBCB, unpub. data).

Of the 2 recruitment sites established on Fort Benning as part of the Land Exchange that were remaining post-Transformation (Section 2.3.8), Cluster O14-03 will be "taken" due to harassment impacts under Alternative A.

Of the 16 clusters currently being monitored solely for Transformation, 7 will be "taken" at the cluster level by either Action Alternative of the proposed action.

Table 6-3. Red-cockaded woodpecker foraging habitat data using the **Standard for Managed Stability** (USFWS 2003a) for all partitions impacted by Alternative A (Preferred Alternative) of the proposed Fort Benning Maneuver Center of Excellence projects, Chattahoochee and Muscogee Counties, Georgia.

	Pre- Project Foraging Habitat Totals									Project Removals							Post- Project Foraging Habitat Totals												
Cluster	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Forested Acreage (within A20 Impact Area)	Future Potential Acreage	Future Potential BA	Suitable, Potentially Suitable + Forested Acreage	Suitable + Potentially Suitable BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Forested Acreage (within A20 Impact Area)	Future Potential Acreage	Future Potential BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Forested Acreage (within A20 Impact Area) Removed	Future Potential Acreage	Future Potential BA	Total Suitable, Potentially Suitable + Forested Acreage	Total Suitable + Potentially Suitable BA	Total Manageable Acres	Deficient Pre-project?	Deficient Post-project?
A06-01	153.64	7,067.44	0.00	0.00	35.23	33.72	734.22	**188.87**	**7,067.44**	1.79	82.34	0.00	0.00	0.00	0.63	14.43	151.85	6,985.10	0.00	0.00	35.23	33.09	719.79	**187.08**	**6,985.10**	**220.17**	N	N
A08-03	97.79	4,009.39	0.00	0.00	17.33	2.00	51.00	**115.13**	**4,009.39**	0.00	0.00	0.00	0.00	5.74	0.00	0.00	97.79	4,009.39	0.00	0.00	11.59	2.00	51.00	**109.39**	**4,009.39**	**111.39**	N	N
A08-04	27.11	1,111.51	0.00	0.00	154.79	0.00	0.00	**181.90**	**1,111.51**	0.00	0.00	0.00	0.00	6.96	0.00	0.00	27.11	1,111.51	0.00	0.00	147.83	0.00	0.00	**174.94**	**1,111.51**	**174.94**	N	N
A20-04	20.97	1,059.61	74.16	3,424.07	155.36	62.22	1,545.99	**250.49**	**4,483.68**	2.50	126.33	3.97	194.53	0.00	1.91	49.66	18.47	933.28	70.19	3,229.54	155.36	60.31	1,496.33	**244.02**	**4,162.82**	**304.33**	N	N

	Pre- Project Foraging Habitat Totals								Project Removals						Post- Project Foraging Habitat Totals															
Cluster	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Suitable + Potentially Suitable Acreage	Suitable + Potentially Suitable BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Non-contiguous Habitat Acreage	Non-contiguous Habitat BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Total Suitable + Potentially Suitable Acreage	Total Suitable + Potentially Suitable BA	Total Manageable Acres	Deficient Pre-project?	Deficient Post-project?
A07-01	35.59	1,313.44	0.00	0.00	147.44	4,009.86	**35.59**	**1,313.44**	2.96	100.64	0.00	0.00	9.42	259.67	0.00	0.00	32.63	1,212.80	0.00	0.00	138.02	3,750.19	**32.63**	**1,212.80**	**170.65**	Y	Y
A08-01	113.80	4,648.57	45.47	1,709.08	27.96	377.04	**159.27**	**6,357.63**	3.26	130.74	1.16	44.08	1.83	33.60	0.00	0.00	110.54	4,517.83	44.31	1,664.98	26.13	343.44	**154.85**	**6,182.81**	**180.98**	N	N
A08-02a	81.50	2,895.42	6.85	294.55	0.00	0.00	**88.35**	**3,189.97**	1.80	63.00	1.29	55.47	0.00	0.00	0.00	0.00	79.70	2,832.42	5.56	239.08	0.00	0.00	**85.26**	**3,071.50**	**85.26**	N	N
A09-03R	11.89	419.17	108.07	3,526.72	8.40	0.00	**119.96**	**3,945.89**	0.69	25.30	4.40	146.99	1.19	0.00	0.00	0.00	11.20	393.87	103.67	3,379.73	7.21	0.00	**114.87**	**3,773.60**	**122.08**	N	N
A09-04R*	78.15	2,563.11	4.29	130.85	121.29	2,680.81	**82.44**	**2,693.96**	0.00	0.00	0.00	0.00	17.11	427.70	0.00	0.00	78.15	2,563.11	4.29	130.85	104.18	2,253.11	**82.44**	**2,693.96**	**186.62**	Y	Y
A09-05	111.60	4,190.16	13.35	405.51	50.12	1,206.58	**124.95**	**4,595.67**	3.83	140.60	0.15	4.50	0.20	5.00	0.00	0.00	107.77	4,049.56	13.20	401.01	49.92	1,201.58	**120.97**	**4,450.57**	**170.89**	N	N
A17-01	85.96	4,545.01	32.01	1,509.58	0.00	0.00	**117.97**	**6,054.59**	85.17	4,503.93	12.04	463.54	0.00	0.00	0.00	0.00	0.79	41.08	19.97	1,046.04	0.00	0.00	**20.76**	**1,087.12**	**20.76**	N	Y
A17-02	62.70	3,298.06	0.00	0.00	58.72	428.19	**62.70**	**3,298.06**	60.44	3,187.32	0.00	0.00	56.67	407.69	0.00	0.00	2.26	110.74	0.00	0.00	2.05	20.50	**2.26**	**110.74**	**4.31**	Y	Y
A17-03	88.10	4,660.04	20.17	1,008.50	0.00	0.00	**108.27**	**5,668.54**	59.74	3,116.43	11.98	599.00	0.00	0.00	0.00	0.00	28.36	1,543.61	8.19	409.50	0.00	0.00	**36.55**	**1,953.11**	**36.55**	N	Y
A17-06	96.66	4,321.54	0.00	0.00	24.01	98.00	**96.66**	**4,321.54**	91.25	4,058.05	0.00	0.00	0.14	3.08	0.00	0.00	5.41	263.49	0.00	0.00	23.87	94.92	**5.41**	**263.49**	**29.28**	N	Y
A17-08	111.84	7,119.92	0.00	0.00	18.73	106.10	**111.84**	**7,119.92**	111.84	7,119.92	0.00	0.00	18.73	106.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	N	Y
A17-11R	123.32	8,139.12	0.00	0.00	0.35	1.93	**123.32**	**8,139.12**	106.53	7,030.98	0.00	0.00	0.35	1.93	0.00	0.00	16.79	1,108.14	0.00	0.00	0.00	0.00	**16.79**	**1,108.14**	**16.79**	N	Y
A17-12R	14.81	977.46	43.67	1,593.96	62.53	1,486.81	**58.48**	**2,571.42**	4.75	313.50	0.00	0.00	26.47	684.53	0.00	0.00	10.06	663.96	43.67	1,593.96	36.06	802.28	**53.73**	**2,257.92**	**89.79**	Y	Y
A17-13	80.36	4,178.72	24.42	1,221.00	0.00	0.00	**104.78**	**5,399.72**	58.95	3,065.40	8.80	440.00	0.00	0.00	0.00	0.00	21.41	1,113.32	15.62	781.00	0.00	0.00	**37.03**	**1,894.32**	**37.03**	N	Y
A17-14a	66.47	3,542.07	20.18	1,130.39	15.92	95.52	**86.65**	**4,672.46**	2.64	137.28	0.00	0.00	0.00	0.00	0.00	0.00	63.83	3,404.79	20.18	1,130.39	15.92	95.52	**84.01**	**4,535.18**	**99.93**	N	N
A20-06	121.55	4,441.49	0.00	0.00	50.97	1,402.06	**121.55**	**4,441.49**	3.58	134.67	0.00	0.00	0.46	0.00	0.00	0.00	117.97	4,306.82	0.00	0.00	50.51	1,402.06	**117.97**	**4,306.82**	**168.48**	N	N
BB03-01R	23.48	872.37	6.55	326.60	100.60	1,786.60	**30.03**	**1,198.97**	0.55	23.32	0.48	22.40	8.43	186.63	0.00	0.00	22.93	849.05	6.07	304.20	92.17	1,599.97	**29.00**	**1,153.25**	**121.17**	Y	Y
BB04-01R	102.51	4,134.91	4.02	291.37	37.28	809.54	**106.53**	**4,426.28**	7.48	342.33	0.00	0.00	4.03	71.86	7.34	337.64	87.69	3,454.94	4.02	291.37	33.25	737.68	**91.71**	**3,746.31**	**124.96**	N	N
BB05-01R	87.25	3,424.61	101.41	3,976.85	55.34	1,308.38	**188.66**	**7,401.46**	12.62	580.52	0.59	24.49	0.53	11.00	0.00	0.00	74.63	2,844.09	100.82	3,952.36	54.81	1,297.38	**175.45**	**6,796.45**	**230.26**	N	N
C01-03	18.97	982.80	71.81	2,841.78	41.32	676.98	**90.78**	**3,824.58**	1.15	70.15	3.81	161.10	3.47	93.14	0.00	0.00	17.82	912.65	68.00	2,680.68	37.85	583.84	**85.82**	**3,593.33**	**123.67**	N	N
C01-06	27.04	1,212.32	75.53	3,105.49	19.38	75.90	**102.57**	**4,317.81**	0.00	0.00	9.44	383.27	1.07	30.50	0.00	0.00	27.04	1,212.32	66.09	2,722.22	18.31	45.40	**93.13**	**3,934.54**	**111.44**	N	N
D05-02R	125.55	4,943.82	0.00	0.00	38.87	853.42	**125.55**	**4,943.82**	34.50	1,526.89	0.00	0.00	26.88	591.36	0.00	0.00	91.05	3,416.93	0.00	0.00	11.99	262.06	**91.05**	**3,416.93**	**103.04**	N	N
D05-04R	243.87	9,780.13	0.00	0.00	46.85	502.91	**243.87**	**9,780.13**	121.72	5,032.87	0.00	0.00	28.91	376.76	0.00	0.00	122.15	4,747.26	0.00	0.00	17.94	126.15	**122.15**	**4,747.26**	**140.09**	N	N
D06-01R	63.12	1,955.13	0.00	0.00	92.27	1,490.97	**63.12**	**1,955.13**	0.03	0.95	0.00	0.00	39.39	492.29	13.94	135.64	63.09	1,954.18	0.00	0.00	38.94	863.04	**63.09**	**1,954.18**	**102.03**	Y	Y
D08-01R	86.01	3,154.70	0.00	0.00	131.25	1,317.27	**86.01**	**3,154.70**	46.40	1,924.82	0.00	0.00	39.54	746.83	0.00	0.00	39.61	1,229.88	0.00	0.00	91.71	570.44	**39.61**	**1,229.88**	**131.32**	N	Y
D10-01	48.18	1,605.05	0.00	0.00	105.75	929.93	**48.18**	**1,605.05**	2.50	87.75	0.00	0.00	15.39	73.34	4.97	115.13	45.68	1,517.30	0.00	0.00	85.39	741.46	**45.68**	**1,517.30**	**131.07**	Y	Y
D11-01	94.01	3,502.41	0.00	0.00	49.69	104.47	**94.01**	**3,502.41**	49.86	1,851.03	0.00	0.00	34.63	97.20	0.00	0.00	44.15	1,651.38	0.00	0.00	15.06	7.27	**44.15**	**1,651.38**	**59.21**	N	Y
D11-02	104.88	3,871.19	0.00	0.00	54.91	1,277.31	**104.88**	**3,871.19**	88.91	3,296.06	0.00	0.00	50.54	1,166.10	15.94	572.20	0.15	5.77	0.00	0.00	4.25	108.37	**0.15**	**5.77**	**4.40**	N	Y
D12-01	106.88	4,975.59	0.00	0.00	111.76	2,011.29	**106.88**	**4,975.59**	13.87	611.95	0.00	0.00	13.06	200.29	0.00	0.00	93.01	4,363.64	0.00	0.00	98.70	1,811.00	**93.01**	**4,363.64**	**191.71**	N	N
D16-01	38.63	1,494.10	18.51	620.09	167.49	2,506.48	**57.14**	**2,114.19**	0.00	0.00	18.50	619.75	29.40	297.22	0.00	0.00	38.63	1,494.10	0.01	0.34	138.09	2,209.26	**38.64**	**1,494.44**	**176.73**	Y	Y
D16-02	16.55	575.61	0.00	0.00	209.69	3,423.84	**16.55**	**575.61**	16.55	575.61	0.00	0.00	159.06	2,577.34	24.03	497.47	0.00	0.00	0.00	0.00	26.60	349.03	**0.00**	**0.00**	**26.60**	Y	Y
D17-01	134.03	4,844.96	10.52	320.86	160.44	1,655.40	**144.55**	**5,165.82**	59.73	2,264.17	0.00	0.00	34.54	615.61	24.28	578.42	74.30	2,580.79	10.52	320.86	101.62	461.37	**84.82**	**2,901.65**	**186.44**	N	Y
D17-03	114.09	4,242.34	0.00	0.00	89.62	1,782.06	**114.09**	**4,242.34**	62.30	2,321.38	0.00	0.00	52.41	1,047.54	0.00	0.00	51.79	1,920.96	0.00	0.00	37.21	734.52	**51.79**	**1,920.96**	**89.00**	N	Y
D17-04R	90.79	3,545.37	0.00	0.00	101.80	1,865.55	**90.79**	**3,545.37**	43.23	1,617.86	0.00	0.00	54.45	1,287.53	0.00	0.00	47.56	1,927.51	0.00	0.00	47.35	578.02	**47.56**	**1,927.51**	**94.91**	N	Y
E02-01	89.39	2,821.35	19.08	576.34	73.24	395.65	**108.47**	**3,397.69**	1.27	39.37	0.69	22.23	0.97	9.81	0.00	0.00	88.12	2,781.98	18.38	554.11	72.27	385.84	**106.50**	**3,336.09**	**178.77**	N	N
E04-01	115.00	4,509.48	0.00	0.00	52.36	1,259.72	**115.00**	**4,509.48**	49.27	1,953.72	0.00	0.00	10.53	349.85	0.00	0.00	65.73	2,555.76	0.00	0.00	41.83	909.87	**65.73**	**2,555.76**	**107.56**	N	Y
F02-01R	53.68	2,336.44	0.00	0.00	136.76	2,646.83	**53.68**	**2,336.44**	41.86	1,808.38	0.00	0.00	87.82	1,806.05	0.00	0.00	11.82	528.06	0.00	0.00	48.94	840.78	**11.82**	**528.06**	**60.76**	Y	Y
HCC-08R	46.77	1,556.16	50.04	1,573.41	92.09	2,398.11	**96.81**	**3,129.57**	0.61	26.23	0.00	0.00	0.00	0.00	0.00	0.00	46.16	1,529.93	50.04	1,573.41	92.09	2,398.11	**96.20**	**3,103.34**	**188.29**	N	N
HCC-10R	122.28	4,302.80	11.74	457.11	11.07	204.00	**134.02**	**4,759.91**	17.14	607.79	1.70	58.54	0.29	3.90	2.03	75.09	103.11	3,619.92	10.04	398.57	10.78	200.10	**113.15**	**4,018.49**	**123.93**	N	N
HCC-11R	11.73	385.31	1.05	56.00	196.06	4,659.29	**12.78**	**441.31**	0.93	36.74	0.00	0.00	13.16	333.88	1.23	47.11	9.57	301.46	1.05	56.00	182.90	4,325.41	**10.62**	**357.46**	**193.52**	Y	Y
J01-02R	50.92	2,215.31	0.00	0.00	147.86	1,213.96	**50.92**	**2,215.31**	2.88	229.97	0.00	0.00	3.48	0.00	0.00	0.00	48.04	1,985.34	0.00	0.00	144.38	1,213.96	**48.04**	**1,985.34**	**192.42**	Y	Y
J02-02R	10.81	459.43	7.23	271.13	122.52	2,792.57	**18.04**	**730.56**	4.69	199.33	0.00	0.00	11.68	301.02	0.00	0.00	6.12	260.10	7.23	271.13	110.84	2,491.55	**13.35**	**531.23**	**124.19**	Y	Y
J06-03	215.01	7,751.93	0.13	4.04	73.30	2,012.96	**215.14**	**7,755.97**	36.99	1,413.45	0.00	0.00	7.30	215.35	0.00	0.00	178.02	6,338.48	0.13	4.04	66.00	1,797.61	**178.15**	**6,342.52**	**244.15**	N	N
K02-01	0.00	0.00	10.65	330.41	245.71	5,602.37	**10.65**	**330.41**	0.00	0.00	0.48	15.12	170.65	3,918.52	12.69	356.70	0.00	0.00	0.04	1.26	72.50	1,641.18	**0.04**	**1.26**	**72.54**	Y	Y
K08-03	97.98	3,561.55	0.00	0.00	28.93	0.00	**97.98**	**3,561.55**	12.50	434.05	0.00	0.00	0.00	0.00	0.00	0.00	85.48	3,127.50	0.00	0.00	28.93	0.00	**85.48**	**3,127.50**	**114.41**	N	N
K08-04	180.60	6,661.97	0.00	0.00	11.79	129.66	**180.60**	**6,661.97**	13.78	525.63	0.00	0.00	1.36	40.12	37.59	1,086.30	136.31	5,139.58	0.00	0.00	3.35	0.00	**136.31**	**5,139.58**	**139.66**	N	N
K09-01	89.84	3,810.40	0.44	22.00	59.02	1,672.01	**90.28**	**3,832.40**	1.20	44.80	0.00	0.00	2.23	65.79	0.00	0.00	88.64	3,765.60	0.44	22.00	56.79	1,606.22	**89.08**	**3,787.60**	**145.87**	N	N
K09-02R	124.95	4,821.83	2.04	102.00	26.19	478.76	**126.99**	**4,723.83**	19.90	743.38	0.00	0.00	24.47	433.62	0.00	0.00	105.05	3,878.45	2.04	102.00	1.72	45.14	**107.09**	**3,980.45**	**108.81**	N	N
K09-03R	144.42	5,160.01	44.32	2,216.00	58.23	644.11	**188.74**	**7,376.01**	9.23	315.13	0.61	30.50	7.38	108.28	0.00	0.00	135.19	4,844.88	43.71	2,185.50	50.85	535.83	**178.90**	**7,030.38**	**229.75**	N	N
K11-02	219.20	8,250.23	5.12	174.08	58.35	386.90	**224.32**	**8,424.31**	59.34	2,347.30	0.00	0.00	14.32	258.08	0.00	0.00	159.86	5,902.93	5.12	174.08	44.03	128.82	**164.98**	**6,077.01**	**209.01**	N	N
K11-04R	46.50	1,730.88	0.00	0.00	129.93	1,966.25	**46.50**	**1,730.88**	9.29	381.74	0.00	0.00	70.48	1,151.25	0.00	0.00	37.21	1,349.14	0.00	0.00	59.45	815.00	**37.21**	**1,349.14**	**96.66**	Y	Y

***Cluster A08-04R is not considered a "take" in spite of being deficient in basal area because there is enough forested habitat of suitable age within the A20 Dudded Impact Area to meet the minimum SMS acreage standard.**

****Cluster A09-04R is deficient pre-project but is not considered a "take" because no suitable or potentially suitable habitat will be removed as a result of project impacts.**

Table 6-3 (cont.) . Red-cockaded woodpecker foraging habitat data using the **Standard for Managed Stability** (USFWS 2003) for all partitions impacted by Alternative A (Preferred Alternative) of the proposed Fort Benning Maneuver Center of Excellence projects, Chattahoochee and Muscogee Counties, Georgia.

	Pre- Project Foraging Habitat Totals								Project Removals						Post- Project Foraging Habitat Totals												
Cluster	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Suitable + Potentially Suitable Acreage	Suitable + Potentially Suitable BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Non-contiguous Habitat Acreage	Non-contiguous Habitat BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Total Suitable + Potentially Suitable Acreage	Total Suitable + Potentially Suitable BA	Total Manageable Acres	Deficient Pre-project?	Deficient Post-project?
K12-01	137.11	5,735.15	0.00	0.00	65.27	397.22	**137.11**	**5,735.15**	45.82	1,962.37	0.00	0.00	0.00	0.00	0.00	0.00	91.29	3,772.78	0.00	0.00	65.27	397.22	**91.29**	**3,772.78**	**156.56**	N	N
K13-02	92.47	4,397.26	7.51	300.40	52.66	1,421.84	**99.98**	**4,697.66**	58.38	2,426.42	0.00	0.00	18.93	490.28	0.00	0.00	34.09	1,970.84	7.51	300.40	33.73	931.56	**41.60**	**2,271.24**	**75.33**	N	Y
K13-04	54.07	1,779.47	40.74	1,885.00	84.04	720.16	**94.81**	**3,664.47**	37.00	1,207.66	24.90	1,132.95	31.87	0.00	0.00	0.00	17.07	571.81	15.84	752.05	52.17	720.16	**32.91**	**1,323.86**	**85.08**	N	Y
K13-05R	55.07	2,538.46	0.00	0.00	54.29	1,062.07	**55.07**	**2,538.46**	12.77	519.81	0.00	0.00	4.51	26.00	0.00	0.00	42.30	2,018.65	0.00	0.00	0.00	49.78	1,036.07	**42.30**	**2,018.65**	**92.08**	Y	Y
K13-06	33.75	1,171.79	129.48	5,483.35	46.70	0.00	**163.23**	**6,655.14**	0.00	0.00	0.63	22.40	4.65	0.00	0.00	0.00	33.75	1,171.79	128.85	5,460.95	42.05	0.00	**162.60**	**6,632.74**	**204.65**	N	N
K21-02R	175.02	7,509.92	0.00	0.00	33.15	780.02	**175.02**	**7,509.92**	32.19	1,285.04	0.00	0.00	4.66	109.65	0.00	0.00	142.83	6,224.88	0.00	0.00	28.49	670.37	**142.83**	**6,224.88**	**171.32**	N	N
K21-05R	245.38	10,454.52	0.00	0.00	27.39	321.50	**245.38**	**10,454.52**	68.78	2,770.53	0.00	0.00	0.03	0.57	0.00	0.00	176.60	7,683.99	0.00	0.00	27.36	320.93	**176.60**	**7,683.99**	**203.96**	N	N
KPR-01	82.03	4,519.79	67.75	2,869.86	27.50	501.11	**149.78**	**7,389.65**	10.63	610.63	7.80	320.74	3.22	83.19	0.00	0.00	71.40	3,909.16	59.95	2,549.12	24.28	417.92	**131.35**	**6,458.28**	**155.63**	N	N
LO2-02R	117.31	4,613.67	24.17	1,052.86	112.06	2,206.05	**141.48**	**5,666.53**	35.02	1,341.64	7.91	332.92	35.78	725.21	63.85	1,845.66	71.02	2,796.21	5.65	169.50	34.31	661.44	**76.67**	**2,965.71**	**110.98**	N	Y
L03-01	41.59	1,966.83	8.90	399.76	57.40	1,140.23	**50.49**	**2,366.59**	14.34	609.28	3.77	166.54	15.70	321.88	0.00	0.00	27.25	1,357.55	5.13	233.22	41.70	818.35	**32.38**	**1,590.77**	**74.08**	Y	Y
M01-01	48.31	2,133.46	0.00	0.00	65.14	1,323.19	**48.31**	**2,133.46**	1.69	75.84	0.00	0.00	2.10	51.41	0.00	0.00	46.62	2,057.62	0.00	0.00	63.04	1,271.78	**46.62**	**2,057.62**	**109.66**	Y	Y
M08-01	115.13	5,256.85	19.96	758.48	133.14	3,323.74	**135.09**	**6,015.33**	12.05	514.03	0.00	0.00	6.30	140.14	0.00	0.00	103.08	4,742.82	19.96	758.48	126.84	3,183.60	**123.04**	**5,501.30**	**249.88**	N	N
M08-02a	123.64	5,686.47	17.25	830.68	17.55	286.45	**140.89**	**6,517.15**	8.66	409.12	0.50	26.75	0.00	0.00	0.00	0.00	114.98	5,277.35	16.75	803.93	17.55	286.45	**131.73**	**6,081.28**	**149.28**	N	N
M08-02b	75.99	3,351.79	10.35	374.84	30.41	663.06	**86.34**	**3,726.63**	9.36	413.14	0.00	0.00	5.56	135.89	0.00	0.00	66.63	2,938.65	10.35	374.84	24.85	527.17	**76.98**	**3,313.49**	**101.83**	N	N
M08-04R	52.64	1,894.52	42.57	1,383.53	100.17	2,140.82	**95.21**	**3,278.05**	4.08	135.90	0.00	0.00	7.31	107.68	0.00	0.00	48.56	1,758.62	42.57	1,383.53	92.86	2,033.14	**91.13**	**3,142.15**	**183.99**	N	N
M08-05R	94.72	4,240.06	84.06	3,652.10	73.04	1,182.08	**178.78**	**7,892.16**	0.26	9.62	1.84	57.33	5.98	103.29	0.00	0.00	94.46	4,230.44	82.22	3,594.77	67.06	1,078.79	**176.68**	**7,825.21**	**243.74**	N	N
N01-02	65.26	2,522.32	29.33	1,339.39	33.59	351.12	**94.59**	**3,861.71**	0.98	38.22	2.36	98.23	1.02	20.40	0.00	0.00	64.28	2,484.10	26.97	1,241.16	32.57	330.72	**91.25**	**3,725.26**	**123.82**	N	N
O01-01	110.72	4,120.49	28.35	935.95	9.25	47.78	**139.07**	**5,056.44**	10.00	389.89	0.00	0.00	0.34	9.28	0.00	0.00	100.72	3,730.60	28.35	935.95	8.91	38.50	**129.07**	**4,666.55**	**137.98**	N	N
O01-02	24.05	877.11	12.16	498.56	112.46	2,236.35	**36.21**	**1,375.67**	5.61	207.53	0.61	25.01	13.73	292.87	0.00	0.00	18.44	669.58	11.55	473.55	98.73	1,943.48	**29.99**	**1,143.13**	**128.72**	Y	Y
O01-03	86.23	3,768.47	23.52	1,079.14	40.74	745.27	**109.75**	**4,847.61**	5.09	244.03	4.34	197.20	13.75	228.79	0.00	0.00	81.14	3,524.44	19.18	881.94	26.99	516.48	**100.32**	**4,406.38**	**127.31**	N	N
O01-04R	48.70	2,058.33	72.87	2,922.05	47.54	819.75	**121.57**	**4,980.38**	6.52	254.43	6.30	244.18	9.50	180.56	0.00	0.00	42.18	1,803.90	66.57	2,677.87	38.04	639.19	**108.75**	**4,481.77**	**146.79**	N	N
O02-01R	54.69	2,430.15	61.30	2,560.76	103.56	1,889.73	**115.99**	**4,990.91**	7.82	315.70	1.82	70.06	8.43	74.16	0.00	0.00	46.87	2,114.45	59.48	2,490.70	95.13	1,815.57	**106.35**	**4,605.15**	**201.48**	N	N
O03-01	16.68	669.02	29.59	1,063.85	47.03	1,109.74	**46.27**	**1,732.87**	1.00	40.00	4.74	167.60	5.54	124.30	0.00	0.00	15.68	629.02	24.85	896.25	41.49	985.44	**40.53**	**1,525.27**	**82.02**	Y	Y
O03-02	116.42	4,712.84	0.00	0.00	47.04	648.55	**116.42**	**4,712.84**	20.77	877.68	0.00	0.00	11.38	197.92	0.00	0.00	95.65	3,835.16	0.00	0.00	35.66	450.63	**95.65**	**3,835.16**	**131.31**	N	N
O03-03	45.82	2,007.64	0.00	0.00	116.60	1,272.13	**45.82**	**2,007.64**	8.55	397.95	0.00	0.00	15.15	165.20	0.00	0.00	37.27	1,609.69	0.00	0.00	101.45	1,106.93	**37.27**	**1,609.69**	**138.72**	Y	Y
O03-04	30.00	1,037.71	6.36	254.34	156.50	2,012.23	**36.36**	**1,292.05**	5.26	176.55	0.00	0.00	22.44	285.29	0.00	0.00	24.74	861.16	6.36	254.34	134.06	1,726.94	**31.10**	**1,115.50**	**165.16**	Y	Y
O03-05	152.93	6,474.35	43.54	1,676.66	71.71	570.39	**196.47**	**8,151.01**	12.74	494.48	4.93	194.74	8.03	67.70	0.00	0.00	140.19	5,979.87	38.61	1,481.92	63.68	502.69	**178.80**	**7,461.79**	**242.48**	N	N
O03-06R	122.32	4,283.33	0.00	0.00	143.78	3,469.15	**122.32**	**4,283.33**	22.34	763.99	0.00	0.00	12.69	355.60	0.00	0.00	99.98	3,519.34	0.00	0.00	131.09	3,113.55	**99.98**	**3,519.34**	**231.07**	N	N
O03-07	122.38	5,086.28	0.00	0.00	56.01	507.19	**122.38**	**5,086.28**	10.42	415.76	0.00	0.00	0.37	0.00	0.00	0.00	111.96	4,670.52	0.00	0.00	55.64	507.19	**111.96**	**4,670.52**	**167.60**	N	N
O04-01	0.00	0.00	0.00	0.00	73.17	1,778.52	**0.00**	**0.00**	0.00	0.00	0.00	0.00	14.67	355.84	0.00	0.00	0.00	0.00	0.00	0.00	58.50	1,422.68	**0.00**	**0.00**	**58.50**	Y	Y
O04-03a	0.00	0.00	0.00	0.00	75.69	1,627.87	**0.00**	**0.00**	0.00	0.00	0.00	0.00	2.21	47.52	0.00	0.00	0.00	0.00	0.00	0.00	73.48	1,580.35	**0.00**	**0.00**	**73.48**	Y	Y
O04-03b	26.18	1,262.54	0.00	0.00	56.21	800.44	**26.18**	**1,262.54**	4.37	205.39	0.00	0.00	7.15	121.85	0.00	0.00	21.81	1,057.15	0.00	0.00	49.06	678.59	**21.81**	**1,057.15**	**70.87**	Y	Y
O05-01	220.28	11,209.36	8.60	671.22	46.87	620.57	**228.88**	**11,880.58**	23.00	1,115.66	1.75	155.86	4.19	139.00	0.00	0.00	197.28	10,093.70	6.85	515.36	42.68	481.57	**204.13**	**10,609.06**	**246.81**	N	N
O05-02	92.95	3,894.27	10.36	468.35	31.46	813.56	**103.31**	**4,362.62**	31.35	1,359.36	7.39	365.17	27.28	812.36	3.29	104.37	61.60	2,524.91	0.00	0.00	3.86	0.00	**61.60**	**2,524.91**	**65.46**	N	Y
O05-03R	181.66	7,748.62	11.91	471.90	44.45	804.24	**193.57**	**8,220.52**	26.96	1,094.25	9.48	387.48	19.47	253.66	0.00	0.00	154.70	6,654.37	2.43	84.42	24.98	550.58	**157.13**	**6,738.79**	**182.11**	N	N
O07-01R	0.00	0.00	131.74	5,676.85	96.33	1,157.39	**131.74**	**5,676.85**	0.00	0.00	12.13	517.31	38.01	853.87	0.00	0.00	0.00	0.00	119.61	5,159.54	58.32	303.52	**119.61**	**5,159.54**	**177.93**	N	N
O07-03R	73.17	2,900.77	75.33	2,464.09	197.63	4,581.38	**148.50**	**5,364.86**	9.34	349.63	0.00	0.00	10.83	232.57	0.00	0.00	63.83	2,551.14	75.33	2,464.09	186.80	4,348.81	**139.16**	**5,015.23**	**325.96**	N	N
O08-01	13.06	412.93	23.36	876.00	192.50	3,799.26	**36.42**	**1,288.93**	3.05	96.57	3.48	130.50	12.93	231.03	0.00	0.00	10.01	316.36	19.88	745.50	179.57	3,568.23	**29.89**	**1,061.86**	**209.46**	Y	Y
O08-02	43.69	1,800.51	34.00	1,268.46	199.56	4,127.10	**77.69**	**3,068.97**	3.70	131.57	0.00	0.00	14.10	385.28	0.00	0.00	39.99	1,668.94	34.00	1,268.46	185.46	3,741.82	**73.99**	**2,937.40**	**259.45**	N	Y
O09-02	68.56	3,003.15	8.58	400.89	116.17	2,906.97	**77.14**	**3,404.04**	0.00	0.00	0.00	0.00	44.40	1,125.80	0.00	0.00	68.56	3,003.15	8.58	400.89	71.77	1,781.17	**77.14**	**3,404.04**	**148.91**	N	N
O10-01	43.28	1,406.60	69.18	2,590.59	117.33	1,242.64	**112.46**	**3,997.19**	0.00	0.00	12.20	483.76	9.86	118.96	0.17	4.93	43.28	1,406.60	56.98	2,106.83	107.30	1,118.75	**100.26**	**3,513.43**	**207.56**	N	N
O10-02	72.26	2,369.23	2.52	79.58	142.66	994.28	**74.78**	**2,448.81**	2.98	119.20	2.10	66.32	6.17	140.94	0.00	0.00	69.28	2,250.03	0.42	13.26	136.49	853.34	**69.70**	**2,263.29**	**206.19**	Y	Y
O10-03	5.00	192.50	106.93	3,666.92	28.66	539.68	**111.93**	**3,859.42**	1.91	73.54	8.60	291.23	4.24	75.38	0.00	0.00	3.09	118.96	98.33	3,375.69	24.42	464.30	**101.42**	**3,494.65**	**125.84**	N	N
O10-04	0.00	0.00	139.26	4,657.54	25.05	79.67	**139.26**	**4,657.54**	0.00	0.00	14.50	496.83	3.06	0.00	0.00	0.00	0.00	0.00	124.76	4,160.71	21.99	79.67	**124.76**	**4,160.71**	**146.75**	N	N
O11-01	57.56	3,376.17	22.28	871.91	70.47	1,269.31	**79.84**	**4,248.08**	3.38	144.54	1.46	70.92	8.90	10.08	0.00	0.00	54.18	3,231.63	20.82	800.99	61.57	1,259.23	**75.00**	**4,032.62**	**136.57**	N	N
O11-02	71.50	3,000.45	0.00	0.00	19.83	269.54	**71.50**	**3,000.45**	13.77	563.43	0.00	0.00	1.16	29.58	0.00	0.00	57.73	2,437.02	0.00	0.00	18.67	239.96	**57.73**	**2,437.02**	**76.40**	Y	Y
O12-02	70.50	2,599.74	38.50	1,877.18	75.43	1,397.81	**109.00**	**4,476.92**	0.00	0.00	0.00	0.00	9.59	201.39	0.00	0.00	70.50	2,599.74	38.50	1,877.18	65.84	1,196.42	**109.00**	**4,476.92**	**174.84**	N	N
O13-01	23.88	919.27	36.31	1,342.12	56.29	1,171.03	**60.19**	**2,261.39**	2.84	109.73	5.48	201.79	24.03	538.20	1.65	63.02	19.39	746.52	30.83	1,140.33	32.26	632.83	**50.22**	**1,886.85**	**82.48**	Y	Y
O13-02	84.27	3,369.72	19.03	651.99	130.96	2,470.56	**103.30**	**4,021.71**	20.29	809.13	0.46	15.41	30.66	561.72	0.00	0.00	63.98	2,560.59	18.57	636.58	100.30	1,908.84	**82.55**	**3,197.17**	**182.85**	N	N
O13-06R	70.05	2,636.57	4.36	161.32	140.65	3,048.29	**74.41**	**2,797.89**	7.35	273.50	0.00	0.00	16.86	351.70	0.00	0.00	62.70	2,363.07	4.36	161.32	123.79	2,696.59	**67.06**	**2,524.39**	**190.85**	Y	Y
O14-01	120.55	4,452.06	0.00	0.00	128.37	2,736.86	**120.55**	**4,452.06**	13.99	555.39	0.00	0.00	9.99	131.46	0.00	0.00	106.56	3,896.67	0.00	0.00	118.38	2,605.40	**106.56**	**3,896.67**	**224.94**	N	N
O14-02	35.71	1,856.92	0.00	0.00	87.10	1,506.67	**35.71**	**1,856.92**	9.72	505.44	0.00	0.00	16.12	252.48	0.00	0.00	25.99	1,351.48	0.00	0.00	70.98	1,254.19	**25.99**	**1,351.48**	**96.97**	Y	Y
O14-03R	155.48	6,662.22	0.00	0.00	88.73	960.12	**155.48**	**6,662.22**	46.43	1,973.55	0.00	0.00	24.00	331.98	0.00	0.00	109.05	4,688.67	0.00	0.00	64.73	628.14	**109.05**	**4,688.67**	**173.78**	N	N
O15-01	33.21	1,209.95	0.00	0.00	79.97	1,417.31	**33.21**	**1,209.95**	6.17	215.95	0.00	0.00	23.14	387.00	0.00	0.00	27.04	994.00	0.00	0.00	56.83	1,030.31	**27.04**	**994.00**	**83.87**	Y	Y
O15-02	71.77	2,556.25	0.00	0.00	71.88	1,810.29	**71.77**	**2,556.25**	5.23	186.84	0.00	0.00	4.61	100.47	0.00	0.00	66.54	2,369.41	0.00	0.00	67.27	1,709.82	**66.54**	**2,369.41**	**133.81**	Y	Y
O15-03	67.91	2,506.61	0.14	4.62	17.31	171.87	**68.05**	**2,511.23**	7.62	278.29	0.00	0.00	1.77	45.14	0.00	0.00	60.29	2,228.32	0.14	4.62	15.54	126.73	**60.43**	**2,232.94**	**75.97**	Y	Y
Q02-02	62.88	2,369.62	91.05	3,452.28	6.53	106.08	**153.93**	**5,821.90**	1.11	42.74	2.55	79.04	0.00	0.00	0.00	0.00	61.77	2,326.88	88.50	3,373.24	6.53	106.08	**150.27**	**5,700.12**	**156.80**	N	N
Q02-04R	90.86	3,215.34	45.58	2,023.83	79.50	108.60	**136.44**	**5,239.17**	2.16	90.72	9.16	390.48	0.17	0.00	0.00	0.00	88.70	3,124.62	36.42	1,633.35	79.33	108.60	**125.12**	**4,757.97**	**204.45**	N	N
R02-01R	89.70	3,588.13	11.04	817.57	83.41	1,845.25	**100.74**	**4,405.70**	24.79	867.96	3.55	256.67	7.76	191.58	13.74	364.11	64.91	2,720.17	7.49	560.90	61.91	1,289.56	**72.40**	**3,281.07**	**134.31**	N	Y
S01-01	66.61	2,535.58	60.62	2,318.25	0.00	0.00	**127.23**	**4,853.83**	0.80	33.24	0.00	0.00	0.00	0.00	0.00	0.00	65.81	2,502.34	60.62	2,318.25	0.00	0.00	**126.43**	**4,820.59**	**126.43**	N	N
S02-01R	117.81	5,794.52	2.78	107.03	45.52	765.95	**120.59**	**5,901.55**	6.80	286.32	0.00	0.00	0.99	13.86	0.00	0.00	111.01	5,508.20	2.78	107.03	44.53	752.09	**113.79**	**5,615.23**	**158.32**	N	N
S03-01R	1.18	78.47	44.96	1,698.15	100.03	2,649.28	**46.14**	**1,776.62**	0.00	0.00	2.12	91.16	3.10	84.72	0.00	0.00	1.18	78.47	42.84	1,606.99	96.93	2,564.56	**44.02**	**1,685.46**	**140.95**	Y	Y
SHC-02	26.49	1,106.07	127.21	5,189.46	59.13	1,457.37	**153.70**	**6,295.53**	0.00	0.00	0.52	16.40	3.13	76.77	0.00	0.00	26.49	1,106.07	126.69	5,173.06	56.00	1,380.60	**153.18**	**6,279.13**	**209.18**	N	N
T02-01	29.27	1,068.36	0.00	0.00	145.33	3,004.79	**29.27**	**1,068.36**	5.07	185.06	0.00	0.00	1.58	15.11	0.00	0.00	24.20	883.30	0.00	0.00	143.75	2,989.68	**24.20**	**883.30**	**167.95**	Y	Y
T02-02R	0.00	0.00	57.73	2,746.15	103.06	1,690.53	**57.73**	**2,746.15**	0.00	0.00	7.61	376.60	0.00	0.00	0.00	0.00	0.00	0.00	50.12	2,369.45	103.06	1,690.53	**50.12**	**2,369.45**	**153.18**	Y	Y

This cluster is taken as a result of Alternative A Maneuver Center of Excellence projects.

Table 6-4. Red-cockaded woodpecker foraging habitat data using the **Recovery Standard** (USFWS 2003) for all partitions impacted by Alternative A (Preferred Alternative) of the proposed Fort Benning Maneuver Center of Excellence projects, Chattahoochee and Muscogee Counties, Georgia.

	Pre- Project Foraging Habitat Totals								
Cluster	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Forested Acreage (within A20 Impact Area)	Future Potential Acreage	Future Potential BA	Suitable, Potentially Suitable + Forested Acreage	Suitable + Potentially Suitable BA
A06-01	0.00	0.00	0.00	0.00	35.23	187.36	7,801.66	**35.23**	**0.00**
A08-03	0.00	0.00	0.00	0.00	17.33	99.79	4,060.39	**17.33**	**0.00**
A08-04	0.00	0.00	0.00	0.00	154.79	27.11	1,111.51	**154.79**	**0.00**
A20-04	0.00	0.00	4.26	272.64	155.36	153.09	5,757.03	**159.62**	**272.64**

	Project Removals						
	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Forested Acreage (within A20 Impact Area)	Future Potential Acreage	Future Potential BA
	0.00	0.00	0.00	0.00	0.00	2.42	96.77
	0.00	0.00	0.00	0.00	5.74	0.00	0.00
	0.00	0.00	0.00	0.00	6.96	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	8.38	370.52

	Post- Project Foraging Habitat Totals										
	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Forested Acreage (within A20 Impact Area) Removed	Future Potential Acreage	Future Potential BA	Total Suitable, Potentially Suitable and Forested Acreage	Total Suitable + Potentially Suitable BA	Total Manageable Acres	Deficient Pre-project?	Deficient Post-project?
	0.00	0.00	0.00	0.00	35.23	184.94	7,704.89	**35.23**	**0.00**	**220.17**	Y	**Y***
	0.00	0.00	0.00	0.00	11.59	99.79	4,060.39	**11.59**	**0.00**	**111.38**	Y	Y
	0.00	0.00	0.00	0.00	147.83	27.11	1,111.51	**147.83**	**0.00**	**174.94**	Y	**Y***
	0.00	0.00	4.26	272.64	155.36	144.71	5,386.51	**159.62**	**272.64**	**304.33**	Y	**Y***

	Pre- Project Foraging Habitat Totals							
Cluster	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Suitable + Potentially Suitable Acreage	Suitable + Potentially Suitable BA
A07-01	0.00	0.00	1.97	90.62	181.06	5,232.68	1.97	90.62
A08-01	0.00	0.00	0.00	0.00	187.23	6,734.67	0.00	0.00
A08-02a	0.00	0.00	49.77	1,839.67	38.58	1,350.30	49.77	1,839.67
A09-03R	0.00	0.00	0.00	0.00	128.36	3,945.89	0.00	0.00
A09-04R	0.00	0.00	0.00	0.00	203.73	5,374.77	0.00	0.00
A09-05	0.00	0.00	0.00	0.00	175.07	5,802.25	0.00	0.00
A17-01	0.00	0.00	85.96	4,545.01	32.01	1,509.58	85.96	4,545.01
A17-02	0.00	0.00	62.70	3,298.06	58.72	428.19	62.70	3,298.06
A17-03	0.00	0.00	53.95	2,805.40	54.32	2,863.14	53.95	2,805.40
A17-06	0.00	0.00	51.19	2,661.88	69.48	1,757.66	51.19	2,661.88
A17-08	0.00	0.00	111.84	7,119.92	18.73	106.10	111.84	7,119.92
A17-11R	0.00	0.00	123.32	8,139.12	0.35	1.93	123.32	8,139.12
A17-12R	0.00	0.00	14.81	977.46	106.20	3,080.77	14.81	977.46
A17-13	0.00	0.00	80.36	4,178.72	24.42	1,221.00	80.36	4,178.72
A17-14a	0.00	0.00	4.41	229.32	98.16	4,538.66	4.41	229.32
A20-06	0.00	0.00	0.00	0.00	172.52	5,843.55	0.00	0.00
BB03-01R	0.00	0.00	8.78	424.04	166.76	4,004.10	8.78	424.04
BB04-01R	10.85	461.13	23.22	1,036.17	109.74	3,738.52	34.07	1,497.30
BB05-01R	0.00	0.00	0.00	0.00	244.00	8,709.84	0.00	0.00
C01-03	11.55	704.55	35.46	1,557.11	85.09	2,239.90	47.01	2,261.66
C01-06	27.04	1,212.32	47.07	2,024.01	47.84	1,157.38	74.11	3,236.33
D05-02R	0.00	0.00	0.00	0.00	164.42	5,797.24	0.00	0.00
D05-04R	0.00	0.00	0.00	0.00	290.72	10,283.04	0.00	0.00
D06-01R	0.00	0.00	0.00	0.00	155.39	3,446.10	0.00	0.00
D08-01R	0.00	0.00	0.00	0.00	242.89	5,355.42	0.00	0.00
D10-01	40.41	1,333.53	0.00	0.00	132.84	1,891.77	40.41	1,333.53
D11-01	83.36	3,174.20	0.00	0.00	60.34	432.68	83.36	3,174.20
D11-02	45.69	1,762.51	0.00	0.00	114.10	3,385.99	45.69	1,762.51
D12-01	58.36	2,761.74	0.00	0.00	160.28	4,225.14	58.36	2,761.74
D16-01	16.76	838.00	0.00	0.00	207.87	3,782.67	16.76	838.00
D16-02	0.00	0.00	0.00	0.00	226.24	3,999.45	0.00	0.00
D17-01	34.49	1,500.32	0.00	0.00	270.50	5,320.90	34.49	1,500.32
D17-03	13.00	598.00	0.00	0.00	190.71	5,426.40	13.00	598.00
D17-04R	34.55	1,485.25	0.00	0.00	158.04	3,925.67	34.55	1,485.25
E02-01R	0.92	44.62	0.00	0.00	180.78	3,748.72	0.92	44.62
E04-01	9.65	406.95	6.06	575.70	151.65	4,786.55	15.71	982.65
F02-01R	48.58	2,130.20	0.00	0.00	141.86	2,853.07	48.58	2,130.20
HCC-08R	2.74	117.82	0.00	0.00	186.16	5,409.86	2.74	117.82
HCC-10R	0.00	0.00	8.07	347.01	137.02	4,616.90	8.07	347.01
HCC-11R	0.00	0.00	1.74	68.73	207.10	5,031.87	1.74	68.73
J01-02R	**10.45**	**470.25**	**3.62**	**289.60**	**184.71**	**2,669.42**	**14.07**	**759.85**
J02-02R	10.81	459.43	0.00	0.00	129.75	3,063.70	10.81	459.43
J06-03	1.43	53.63	0.00	0.00	287.01	9,715.30	1.43	53.63
K02-01	0.00	0.00	0.00	0.00	256.36	5,932.78	0.00	0.00
K08-03R	37.72	1,603.10	0.00	0.00	89.19	1,958.45	37.72	1,603.10
K08-04	23.14	983.45	5.46	207.48	163.79	5,600.70	28.60	1,190.93
K09-01	49.40	2,240.38	27.09	1,034.70	72.81	2,229.33	76.49	3,275.08
K09-02R	2.44	97.71	2.04	102.00	148.70	5,002.88	4.48	199.71
K09-03R	0.00	0.00	44.32	2,216.00	202.65	5,804.12	44.32	2,216.00
K11-02	68.15	2,854.25	0.00	0.00	214.52	5,956.96	68.15	2,854.25
K11-04R	16.98	716.26	0.00	0.00	159.45	2,980.87	16.98	716.26
K12-01	83.19	3,577.17	0.00	0.00	119.19	2,555.20	83.19	3,577.17
K13-02	45.08	2,536.62	0.00	0.00	107.56	3,582.88	45.08	2,536.62
K13-04	0.00	0.00	0.70	32.90	178.15	4,351.73	0.70	32.90
K13-05R	19.60	1,033.22	22.90	996.15	66.86	1,571.16	42.50	2,029.37

	Project Removals					
	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA
	0.00	0.00	0.00	0.00	12.38	360.31
	0.00	0.00	0.00	0.00	6.25	208.42
	0.00	0.00	1.29	55.47	1.80	63.00
	0.00	0.00	0.00	0.00	6.28	172.29
	0.00	0.00	0.00	0.00	17.11	427.70
	0.00	0.00	0.00	0.00	4.18	150.10
	0.00	0.00	85.17	4,503.93	12.04	463.54
	0.00	0.00	60.44	3,187.32	56.67	407.69
	0.00	0.00	53.93	2,804.36	17.79	911.07
	0.00	0.00	46.93	2,440.36	44.46	1,620.77
	0.00	0.00	111.84	7,119.92	18.73	106.10
	0.00	0.00	106.53	7,030.98	0.35	1.93
	0.00	0.00	4.75	313.50	26.47	684.53
	0.00	0.00	58.95	3,065.40	8.80	440.00
	0.00	0.00	2.64	137.28	0.00	0.00
	0.00	0.00	0.00	0.00	4.04	134.67
	0.00	0.00	0.79	37.44	8.67	194.91
	0.00	0.00	0.27	10.67	11.24	403.52
	0.00	0.00	0.00	0.00	13.74	616.01
	1.15	70.15	3.03	132.98	4.25	121.26
	0.00	0.00	4.91	211.13	5.60	202.64
	0.00	0.00	0.00	0.00	61.38	2,118.25
	0.00	0.00	0.00	0.00	150.63	5,409.63
	0.00	0.00	0.00	0.00	39.42	493.24
	0.00	0.00	0.00	0.00	111.56	3,554.77
	1.80	59.40	0.00	0.00	32.50	698.47
	45.99	1,732.99	0.00	0.00	38.50	215.24
	45.54	1,756.74	0.00	0.00	93.91	2,705.42
	4.48	226.25	0.00	0.00	22.45	585.99
	0.00	0.00	0.00	0.00	47.90	916.97
	0.00	0.00	0.00	0.00	175.61	3,152.95
	20.49	891.32	0.00	0.00	73.78	1,988.46
	12.81	589.26	0.00	0.00	101.90	2,779.66
	9.62	424.32	0.00	0.00	88.06	2,481.07
	0.00	0.00	0.00	0.00	2.93	71.41
	4.20	161.70	3.09	293.55	52.51	1,919.54
	36.76	1,602.14	0.00	0.00	92.92	2,012.29
	0.61	26.23	0.00	0.00	0.00	0.00
	0.00	0.00	0.58	24.94	18.55	645.29
	0.00	0.00	0.93	36.74	13.16	333.88
	0.00	**0.00**	**0.01**	**0.37**	**6.35**	**229.60**
	4.69	199.33	0.00	0.00	11.68	301.02
	0.46	17.25	0.00	0.00	43.83	1,611.55
	0.00	0.00	0.00	0.00	171.13	3,933.64
	2.78	118.15	0.00	0.00	9.72	315.90
	2.48	105.40	2.51	95.38	10.15	364.97
	0.00	0.00	1.05	39.90	2.38	70.69
	2.42	96.80	0.00	0.00	41.95	1,080.20
	0.00	0.00	0.00	0.61	30.50	16.61	423.41
	40.50	1,653.43	0.00	0.00	33.16	951.95
	9.29	381.74	0.00	0.00	70.48	1,151.25
	43.90	1,887.70	0.00	0.00	1.92	74.67
	10.99	565.78	0.00	0.00	66.32	2,350.92
	0.00	0.00	0.00	0.00	93.77	2,340.61
	0.25	12.75	0.00	0.00	17.03	533.06

	Post- Project Foraging Habitat Totals													
	Non-contiguous Habitat Acreage	Non-contiguous Habitat BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Total Suitable + Potentially Suitable Acreage	Total Suitable + Potentially Suitable BA	Total Manageable Acres	Deficient Pre-project?	Deficient Post-project?
	0.00	0.00	0.00	0.00	1.97	90.62	168.68	4,872.37	1.97	90.62	170.65	Y	**Y***
	0.00	0.00	0.00	0.00	0.00	0.00	180.98	6,526.25	0.00	0.00	180.98	Y	**Y***
	0.00	0.00	0.00	0.00	48.48	1,784.20	36.78	1,287.30	48.48	1,784.20	85.26	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	122.08	3,773.60	0.00	0.00	122.08	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	186.62	4,947.07	0.00	0.00	186.62	Y	**Y***
	0.00	0.00	0.00	0.00	0.00	0.00	170.89	5,652.15	0.00	0.00	170.89	Y	**Y***
	0.00	0.00	0.00	0.00	0.79	41.08	19.97	1,046.04	0.79	41.08	20.76	Y	Y
	0.00	0.00	0.00	0.00	2.26	110.74	2.05	20.50	2.26	110.74	4.31	Y	Y
	0.00	0.00	0.00	0.00	0.02	1.04	36.53	1,952.07	0.02	1.04	36.55	Y	Y
	0.00	0.00	0.00	0.00	4.26	221.52	25.02	136.89	4.26	221.52	29.28	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Y	Y
	0.00	0.00	0.00	0.00	16.79	1,108.14	0.00	0.00	16.79	1,108.14	16.79	N	Y
	0.00	0.00	0.00	0.00	10.06	663.96	79.73	2,396.24	10.06	663.96	89.79	Y	Y
	0.00	0.00	0.00	0.00	21.41	1,113.32	15.62	781.00	21.41	1,113.32	37.03	Y	Y
	0.00	0.00	0.00	0.00	1.77	92.04	98.16	4,538.66	1.77	92.04	99.93	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	168.48	5,708.88	0.00	0.00	168.48	Y	**Y***
	0.00	0.00	0.00	0.00	7.99	386.60	158.09	3,809.19	7.99	386.60	166.08	Y	**Y***
	7.34	337.64	10.85	461.13	22.95	1,025.50	91.16	2,997.36	33.80	1,486.63	124.96	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	230.26	8,093.83	0.00	0.00	230.26	Y	**Y***
	0.00	0.00	10.40	634.40	32.43	1,424.13	80.84	2,118.64	42.83	2,058.53	123.67	Y	Y
	0.00	0.00	27.04	1,212.32	42.16	1,812.88	42.24	954.74	69.20	3,025.20	111.44	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	103.04	3,678.99	0.00	0.00	103.04	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	140.09	4,873.41	0.00	0.00	140.09	Y	Y
	13.94	135.64	0.00	0.00	0.00	0.00	102.03	2,817.22	0.00	0.00	102.03	Y	Y
	0.00	0.00	0.00	0.00	0.00	0.00	131.33	1,800.65	0.00	0.00	131.33	Y	Y
	5.26	127.45	38.61	1,274.13	0.00	0.00	95.08	1,065.85	38.61	1,274.13	133.69	Y	Y
	0.00	0.00	37.37	1,441.21	0.00	0.00	21.84	217.44	37.37	1,441.21	59.21	Y	Y
	15.94	572.20	0.15	5.77	0.00	0.00	4.25	108.37	0.15	5.77	4.40	Y	Y
	0.00	0.00	53.88	2,535.49	0.00	0.00	137.83	3,639.15	53.88	2,535.49	191.71	Y	**Y***
	0.00	0.00	16.76	838.00	0.00	0.00	159.97	2,865.70	16.76	838.00	176.73	Y	**Y***
	24.03	497.47	0.00	0.00	0.00	0.00	26.60	349.03	0.00	0.00	26.60	Y	Y
	24.28	578.42	14.00	609.00	0.00	0.00	172.44	2,754.02	14.00	609.00	186.44	Y	**Y***
	0.00	0.00	0.19	8.74	0.00	0.00	88.81	2,646.74	0.19	8.74	89.00	Y	Y
	0.00	0.00	24.93	1,060.93	0.00	0.00	69.98	1,444.60	24.93	1,060.93	94.91	Y	Y
	0.00	0.00	0.92	44.62	0.00	0.00	177.85	3,677.31	0.92	44.62	178.77	Y	**Y***
	0.00	0.00	5.45	245.25	2.97	282.15	99.14	2,867.01	8.42	527.40	107.56	Y	Y
	0.00	0.00	11.82	528.06	0.00	0.00	48.94	840.78	11.82	528.06	60.76	Y	Y
	0.00	0.00	2.13	91.59	0.00	0.00	186.16	5,409.86	2.13	91.59	188.29	Y	**Y***
	2.03	75.09	0.00	0.00	7.49	322.07	116.44	3,896.52	7.49	322.07	123.93	Y	Y
	1.23	47.11	0.00	0.00	0.00	0.00	193.52	4,682.87	0.00	0.00	193.52	Y	**Y***
	0.00	**0.00**	**10.45**	**470.25**	**3.61**	**289.23**	**178.36**	**2,439.82**	**14.06**	**759.48**	**192.42**	Y	**Y***
	0.00	0.00	6.12	260.10	0.00	0.00	118.07	2,762.68	6.12	260.10	124.19	Y	Y
	0.00	0.00	0.97	36.38	0.00	0.00	243.18	8,103.75	0.97	36.38	244.15	Y	**Y***
	12.69	356.70	0.00	0.00	0.00	0.00	72.54	1,642.44	0.00	0.00	72.54	Y	Y
	0.00	0.00	34.94	1,484.95	0.00	0.00	79.47	1,642.55	34.94	1,484.95	114.41	Y	Y
	37.59	1,086.30	20.66	878.05	2.95	112.10	116.05	4,149.43	23.61	990.15	139.66	Y	Y
	0.00	0.00	49.40	2,240.38	26.04	994.80	70.43	2,158.64	75.44	3,235.18	145.87	Y	Y
	0.00	0.00	0.02	0.91	2.04	102.00	106.75	3,922.68	2.06	102.91	108.81	Y	Y
	0.00	0.00	0.00	0.00	43.71	2,185.50	186.04	5,380.71	43.71	2,185.50	229.75	Y	**Y***
	0.00	0.00	27.65	1,200.82	0.00	0.00	181.36	5,005.01	27.65	1,200.82	209.01	Y	**Y***
	0.00	0.00	7.69	334.52	0.00	0.00	88.97	1,829.62	7.69	334.52	96.66	Y	Y
	0.00	0.00	39.29	1,689.47	0.00	0.00	117.27	2,480.53	39.29	1,689.47	156.56	Y	**Y***
	0.00	0.00	34.09	1,970.84	0.00	0.00	41.24	1,231.97	34.09	1,970.84	75.33	Y	Y
	0.00	0.00	0.00	0.00	0.70	32.90	84.38	2,011.12	0.70	32.90	85.08	Y	Y
	0.00	0.00	19.35	1,020.47	22.90	996.15	49.83	1,038.11	42.25	2,016.62	92.08	Y	Y

Table 6-4 (cont.). Red-cockaded woodpecker foraging habitat data using the **Recovery Standard** (USFWS 2003) for all partitions impacted by Alternative A (Preferred Alternative) of the proposed Fort Benning Maneuver Center of Excellence projects, Chattahoochee and Muscogee Counties, Georgia.

	Pre- Project Foraging Habitat Totals							
Cluster	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Suitable + Potentially Suitable Acreage	Suitable + Potentially Suitable BA
K13-06	0.00	0.00	75.85	3,564.95	134.08	3,090.19	75.85	3,564.95
K21-02R	51.25	2,639.38	0.00	0.00	156.92	5,650.56	51.25	2,639.38
K21-05R	111.35	5,102.19	2.42	112.53	159.00	5,561.30	113.77	5,214.72
KPR-01	0.00	0.00	60.42	2,987.70	116.86	4,903.06	60.42	2,987.70
L02-02R	90.79	3,418.24	19.84	1,080.91	142.91	3,373.43	110.63	4,499.15
L03-01	27.26	1,472.04	4.59	238.13	76.04	1,796.65	31.85	1,710.17
M01-01	0.00	0.00	42.78	1,925.10	70.67	1,531.55	42.78	1,925.10
M08-01	0.00	0.00	0.00	0.00	268.23	9,339.07	0.00	0.00
M08-02a	46.60	2,479.35	31.53	1,246.00	80.31	3,078.25	78.13	3,725.35
M08-02b	31.08	1,418.76	17.97	812.45	67.70	2,158.48	49.05	2,231.21
M08-04R	0.00	0.00	0.00	0.00	195.38	5,418.87	0.00	0.00
M08-05R	0.00	0.00	15.98	1,014.73	235.84	8,059.51	15.98	1,014.73
N01-02	20.41	938.86	10.46	502.08	100.31	2,890.39	30.87	1,440.94
O01-01	34.25	1,482.92	0.05	2.05	114.02	3,619.25	34.30	1,484.97
O01-02	2.12	76.32	12.16	498.56	134.39	3,037.14	14.28	574.88
O01-03	3.35	156.91	0.00	0.00	147.14	5,435.97	3.35	156.91
O01-04R	0.01	0.76	0.00	0.00	169.10	5,799.37	0.01	0.76
O02-01R	37.31	1,738.00	56.85	2,416.13	125.39	2,726.51	94.16	4,154.13
O03-01	0.00	0.00	26.77	936.95	66.53	1,905.66	26.77	936.95
O03-02	63.17	2,669.80	5.70	293.55	94.59	2,398.04	68.87	2,963.35
O03-03	22.41	1,165.32	0.00	0.00	155.51	2,671.25	22.41	1,165.32
O03-04	0.00	0.00	0.00	0.00	192.86	3,304.28	0.00	0.00
O03-05	69.35	3,179.14	0.00	0.00	198.83	5,542.26	69.35	3,179.14
O03-06R	0.00	0.00	0.00	0.00	266.10	7,752.48	0.00	0.00
O03-07	0.00	0.00	0.00	0.00	178.39	5,593.47	0.00	0.00
O04-01	0.00	0.00	0.00	0.00	73.17	1,778.52	0.00	0.00
O04-03a	0.00	0.00	0.00	0.00	75.69	1,627.87	0.00	0.00
O04-03b	13.35	627.45	0.00	0.00	105.38	2,132.56	13.35	627.45
O05-01	13.36	660.92	130.79	6,677.13	131.60	5,163.10	144.15	7,338.05
O05-02	10.99	543.72	0.00	0.00	123.78	4,622.46	10.99	543.72
O05-03R	72.82	3,495.36	0.00	0.00	165.20	5,529.40	72.82	3,495.36
O07-01R	0.00	0.00	0.00	0.00	228.07	6,834.24	0.00	0.00
O07-03R	0.01	0.40	0.00	0.00	346.12	9,945.84	0.01	0.40
O08-01	0.00	0.00	0.00	0.00	228.92	5,088.19	0.00	0.00
O08-02	0.00	0.00	19.08	925.38	258.17	6,270.69	19.08	925.38
O09-02	0.00	0.00	43.54	2,111.69	149.77	4,199.32	43.54	2,111.69
O10-01	0.00	0.00	0.00	0.00	229.79	5,239.83	0.00	0.00
O10-02	0.00	0.00	0.00	0.00	233.54	3,974.72	0.00	0.00
O10-03	0.00	0.00	2.67	120.15	137.92	4,278.95	2.67	120.15
O10-04	0.00	0.00	0.00	0.00	164.31	4,737.21	0.00	0.00
O11-01	19.63	1,648.92	9.11	607.36	134.78	3,740.38	28.74	2,256.28
O11-02R	25.65	1,231.20	0.00	0.00	65.68	2,038.79	25.65	1,231.20
O12-02	16.17	740.42	14.78	982.87	153.48	4,151.44	30.95	1,723.29
O13-01	0.00	0.00	0.00	0.00	116.48	3,432.42	0.00	0.00
O13-02	23.48	939.20	0.00	0.00	210.78	5,553.07	23.48	939.20
O13-06R	0.00	0.00	0.00	0.00	215.06	5,846.18	0.00	0.00
O14-01	60.43	2,145.27	0.00	0.00	188.49	5,043.65	60.43	2,145.27
O14-02	0.00	0.00	35.71	1,856.92	96.06	1,826.02	35.71	1,856.92
O14-03R	49.20	2,172.93	10.39	597.43	184.62	4,851.98	59.59	2,770.36
O15-01	0.00	0.00	0.00	0.00	113.18	2,627.26	0.00	0.00
O15-02	0.00	0.00	0.00	0.00	143.65	4,366.54	0.00	0.00
O15-03	1.09	51.23	0.00	0.00	84.27	2,631.87	1.09	51.23
Q02-02	0.00	0.00	0.00	0.00	160.46	5,927.98	0.00	0.00
Q02-04R	0.00	0.00	0.00	0.00	215.94	5,347.77	0.00	0.00
R02-01R	19.81	1,066.36	15.25	926.72	149.09	4,257.87	35.06	1,993.08
S01-01	3.48	186.18	0.00	0.00	123.75	4,667.65	3.48	186.18
S02-01R	60.62	3,507.58	0.00	0.00	105.49	3,159.92	60.62	3,507.58
S03-01R	1.18	78.47	4.18	179.74	140.81	4,167.69	5.36	258.21
SHC-02	0.00	0.00	36.38	1,564.34	176.45	6,188.56	36.38	1,564.34
T02-01	0.00	0.00	0.00	0.00	174.60	4,073.15	0.00	0.00
T02-02R	0.00	0.00	50.40	2,494.80	110.40	1,942.28	50.40	2,494.80

	Project Removals					
	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA
K13-06	0.00	0.00	0.00	0.00	5.28	22.40
K21-02R	0.00	0.00	0.00	0.00	36.85	1,394.69
K21-05R	5.84	248.73	0.00	0.00	62.97	2,522.37
KPR-01	0.00	0.00	6.79	333.40	14.86	681.16
L02-02R	26.30	990.20	4.37	226.72	48.04	1,182.85
L03-01	7.24	390.96	1.75	90.79	24.82	615.95
M01-01	0.00	0.00	1.28	57.60	2.51	69.65
M08-01	0.00	0.00	0.00	0.00	18.35	654.17
M08-02a	7.07	350.81	0.00	0.00	2.09	85.06
M08-02b	3.70	163.44	3.94	178.32	7.28	207.27
M08-04R	0.00	0.00	0.00	0.00	11.39	243.58
M08-05R	0.00	0.00	0.00	0.00	8.08	170.24
N01-02	0.00	0.00	0.00	0.00	4.36	156.85
O01-01	3.73	163.98	0.00	0.00	6.61	235.19
O01-02	0.04	1.44	0.61	25.01	19.30	498.96
O01-03	1.16	54.33	0.00	0.00	22.02	615.69
O01-04R	0.00	0.00	0.00	0.00	22.32	679.17
O02-01R	1.85	83.10	1.09	46.33	15.13	330.49
O03-01	0.00	0.00	4.57	159.95	6.71	171.95
O03-02	13.89	589.97	2.01	103.52	16.25	382.11
O03-03	5.54	288.08	0.00	0.00	18.16	275.07
O03-04	0.00	0.00	0.00	0.00	27.70	461.84
O03-05	6.10	240.66	0.00	0.00	19.60	516.26
O03-06R	0.00	0.00	0.00	0.00	35.03	1,119.59
O03-07	0.00	0.00	0.00	0.00	10.79	415.76
O04-01	0.00	0.00	0.00	0.00	14.67	355.84
O04-03a	0.00	0.00	0.00	0.00	2.21	47.52
O04-03b	4.37	205.39	0.00	0.00	14.74	314.36
O05-01	2.46	121.70	5.68	286.33	20.80	1,002.49
O05-02	1.12	55.42	0.00	0.00	64.90	2,481.49
O05-03R	0.05	2.40	0.00	0.00	55.86	1,732.99
O07-01R	0.00	0.00	0.00	0.00	50.14	1,371.18
O07-03R	0.00	0.00	0.00	0.00	20.17	582.20
O08-01	0.00	0.00	0.00	0.00	19.46	458.10
O08-02	0.00	0.00	0.00	0.00	17.80	516.85
O09-02	0.00	0.00	0.00	0.00	44.40	1,125.80
O10-01	0.00	0.00	0.00	0.00	22.06	602.72
O10-02	0.00	0.00	0.00	0.00	11.25	326.46
O10-03	0.00	0.00	0.00	0.00	14.75	440.15
O10-04	0.00	0.00	0.00	0.00	17.56	496.83
O11-01	0.00	0.00	0.98	65.34	14.43	234.52
O11-02R	2.46	118.08	0.00	0.00	12.47	474.93
O12-02	0.00	0.00	0.00	0.00	9.59	201.39
O13-01	0.00	0.00	0.00	0.00	32.35	849.72
O13-02	2.36	94.40	0.00	0.00	49.05	1,291.86
O13-06R	0.00	0.00	0.00	0.00	24.21	625.20
O14-01	1.97	69.94	0.00	0.00	22.01	616.91
O14-02	0.00	0.00	9.72	505.44	21.28	437.13
O14-03R	12.37	558.95	3.78	217.35	54.28	1,529.23
O15-01	0.00	0.00	0.00	0.00	29.31	602.95
O15-02	0.00	0.00	0.00	0.00	9.84	287.31
O15-03	0.81	38.07	0.00	0.00	8.58	285.36
Q02-02	0.00	0.00	0.00	0.00	3.66	121.78
Q02-04R	0.00	0.00	0.00	0.00	11.49	481.20
R02-01R	1.23	70.73	7.76	365.82	27.11	879.66
S01-01	0.16	8.56	0.00	0.00	0.64	24.68
S02-01R	0.00	0.00	0.00	0.00	7.79	300.18
S03-01R	0.00	0.00	2.12	91.16	3.10	84.72
SHC-02	0.00	0.00	0.00	0.00	3.65	93.17
T02-01	0.00	0.00	0.00	0.00	6.65	200.17
T02-02R	0.00	0.00	7.59	375.71	0.00	0.00

	Post- Project Foraging Habitat Totals												
	Non-contiguous Habitat Acreage	Non-contiguous Habitat BA	Suitable Acreage	Suitable BA	Potentially Suitable Acreage	Potentially Suitable BA	Future Potential Acreage	Future Potential BA	Total Suitable + Potentially Suitable Acreage	Total Suitable + Potentially Suitable BA	Total Manageable Acres	Deficient Pre-project?	Deficient Post-project?
K13-06	0.00	0.00	0.00	0.00	75.85	3,564.95	128.80	3,067.79	75.85	3,564.95	204.65	Y	Y*
K21-02R	0.00	0.00	51.25	2,639.38	0.00	0.00	120.07	4,255.87	51.25	2,639.38	171.32	Y	Y*
K21-05R	0.00	0.00	105.51	4,853.46	2.42	112.53	96.03	3,038.93	107.93	4,965.99	203.96	Y	Y*
KPR-01	0.00	0.00	0.00	0.00	53.63	2,654.30	102.00	4,221.90	53.63	2,654.30	155.63	Y	Y*
L02-02R	63.85	1,845.66	64.49	2,428.04	4.86	303.75	41.63	895.36	69.35	2,731.79	110.98	Y	Y
L03-01	0.00	0.00	20.02	1,081.08	2.84	147.34	51.22	1,180.70	22.86	1,228.42	74.08	Y	Y
M01-01	0.00	0.00	0.00	0.00	41.50	1,867.50	68.16	1,461.90	41.50	1,867.50	109.66	Y	Y
M08-01	0.00	0.00	0.00	0.00	0.00	0.00	249.88	8,684.90	0.00	0.00	249.88	Y	Y*
M08-02a	0.00	0.00	39.53	2,128.54	31.53	1,246.00	78.22	2,993.19	71.06	3,374.54	149.28	Y	Y
M08-02b	0.00	0.00	27.38	1,255.32	14.03	634.13	60.42	1,951.21	41.41	1,889.45	101.83	Y	Y
M08-04R	0.00	0.00	0.00	0.00	0.00	0.00	183.99	5,175.29	0.00	0.00	183.99	Y	Y*
M08-05R	0.00	0.00	0.00	0.00	15.98	1,014.73	227.76	7,889.27	15.98	1,014.73	243.74	Y	Y*
N01-02	0.00	0.00	20.41	938.86	10.46	502.08	95.95	2,733.54	30.87	1,440.94	126.82	Y	Y
O01-01	0.00	0.00	30.52	1,318.94	0.05	2.05	107.41	3,384.06	30.57	1,320.99	137.98	Y	Y
O01-02	0.00	0.00	2.08	74.88	11.55	473.55	115.09	2,538.18	13.63	548.43	128.72	Y	Y
O01-03	0.00	0.00	2.19	102.58	0.00	0.00	125.12	4,820.28	2.19	102.58	127.31	Y	Y
O01-04R	0.00	0.00	0.01	0.76	0.00	0.00	146.78	5,120.20	0.01	0.76	146.79	Y	Y
O02-01R	0.00	0.00	35.46	1,654.90	55.76	2,369.80	110.26	2,396.02	91.22	4,024.70	201.48	Y	Y*
O03-01	0.00	0.00	0.00	0.00	22.20	777.00	59.82	1,733.71	22.20	777.00	82.02	Y	Y
O03-02	0.00	0.00	49.28	2,079.83	3.69	190.03	78.34	2,015.93	52.97	2,269.86	131.31	Y	Y
O03-03	0.00	0.00	16.87	877.24	0.00	0.00	137.35	2,396.18	16.87	877.24	154.22	Y	Y*
O03-04	0.00	0.00	0.00	0.00	0.00	0.00	165.16	2,842.44	0.00	0.00	165.16	Y	Y*
O03-05	0.00	0.00	63.25	2,938.48	0.00	0.00	179.23	5,026.00	63.25	2,938.48	242.48	Y	Y*
O03-06R	0.00	0.00	0.00	0.00	0.00	0.00	231.07	6,632.89	0.00	0.00	231.07	Y	Y*
O03-07	0.00	0.00	0.00	0.00	0.00	0.00	167.60	5,177.71	0.00	0.00	167.60	Y	Y*
O04-01	0.00	0.00	0.00	0.00	0.00	0.00	58.50	1,422.68	0.00	0.00	58.50	Y	Y
O04-03a	0.00	0.00	0.00	0.00	0.00	0.00	73.48	1,580.35	0.00	0.00	73.48	Y	Y
O04-03b	0.00	0.00	8.98	422.06	0.00	0.00	90.64	1,818.20	8.98	422.06	99.62	Y	Y
O05-01	0.00	0.00	10.90	539.22	125.11	6,390.80	110.80	4,160.61	136.01	6,930.02	246.81	N	N
O05-02	3.29	104.37	9.87	488.30	0.00	0.00	55.59	2,036.60	9.87	488.30	65.46	Y	Y
O05-03R	0.00	0.00	72.77	3,492.96	0.00	0.00	109.34	3,796.41	72.77	3,492.96	182.11	Y	Y*
O07-01R	0.00	0.00	0.00	0.00	0.00	0.00	177.93	5,463.06	0.00	0.00	177.93	Y	Y*
O07-03R	0.00	0.00	0.01	0.40	0.00	0.00	325.95	9,363.64	0.01	0.40	325.96	Y	Y*
O08-01	0.00	0.00	0.00	0.00	0.00	0.00	209.46	4,630.09	0.00	0.00	209.46	Y	Y*
O08-02	0.00	0.00	0.00	0.00	19.08	925.38	240.37	5,753.84	19.08	925.38	259.45	Y	Y*
O09-02	0.00	0.00	0.00	0.00	43.54	2,111.69	105.37	3,073.52	43.54	2,111.69	148.91	Y	Y
O10-01	0.17	4.93	0.00	0.00	0.00	0.00	207.56	4,632.18	0.00	0.00	207.56	Y	Y*
O10-02	0.00	0.00	0.00	0.00	0.00	0.00	222.29	3,648.26	0.00	0.00	222.29	Y	Y*
O10-03	0.00	0.00	0.00	0.00	2.67	120.15	123.17	3,838.80	2.67	120.15	125.84	Y	Y
O10-04	0.00	0.00	0.00	0.00	0.00	0.00	146.75	4,240.38	0.00	0.00	146.75	Y	Y
O11-01	0.00	0.00	19.63	1,648.92	8.13	542.02	120.35	3,505.86	27.76	2,190.94	148.11	Y	Y
O11-02R	0.00	0.00	23.19	1,113.12	0.00	0.00	53.21	1,563.86	23.19	1,113.12	76.40	Y	Y
O12-02	0.00	0.00	16.17	740.42	14.78	982.87	143.89	3,950.05	30.95	1,723.29	174.84	Y	Y*
O13-01	1.65	63.02	0.00	0.00	0.00	0.00	82.48	2,519.68	0.00	0.00	82.48	Y	Y
O13-02	0.00	0.00	21.12	844.80	0.00	0.00	161.73	4,261.21	21.12	844.80	182.85	Y	Y*
O13-06R	0.00	0.00	0.00	0.00	0.00	0.00	190.85	5,220.98	0.00	0.00	190.85	Y	Y*
O14-01	0.00	0.00	58.46	2,075.33	0.00	0.00	166.48	4,426.74	58.46	2,075.33	224.94	Y	Y*
O14-02	3.80	134.70	0.00	0.00	25.99	1,351.48	70.98	1,254.19	25.99	1,351.48	96.97	Y	Y
O14-03R	0.00	0.00	36.83	1,613.98	6.61	380.08	130.34	3,322.75	43.44	1,994.06	173.78	Y	Y*
O15-01	0.00	0.00	0.00	0.00	0.00	0.00	83.87	2,024.31	0.00	0.00	83.87	Y	Y
O15-02	0.00	0.00	0.00	0.00	0.00	0.00	133.81	4,079.23	0.00	0.00	133.81	Y	Y
O15-03	0.00	0.00	0.28	13.16	0.00	0.00	75.69	2,346.51	0.28	13.16	75.97	Y	Y
Q02-02	0.00	0.00	0.00	0.00	0.00	0.00	156.80	5,806.20	0.00	0.00	156.80	Y	Y*
Q02-04R	0.00	0.00	0.00	0.00	0.00	0.00	204.45	4,866.57	0.00	0.00	204.45	Y	Y*
R02-01R	13.74	364.11	18.58	995.63	7.49	560.90	108.24	3,014.10	26.07	1,556.53	134.31	Y	Y
S01-01	0.00	0.00	3.32	177.62	0.00	0.00	123.11	4,642.97	3.32	177.62	126.43	Y	Y
S02-01R	0.00	0.00	60.62	3,507.58	0.00	0.00	97.70	2,859.74	60.62	3,507.58	158.32	Y	Y*
S03-01R	0.00	0.00	1.18	78.47	2.06	88.58	137.71	4,082.97	3.24	167.05	140.95	Y	Y
SHC-02	0.00	0.00	0.00	0.00	36.38	1,564.34	172.80	6,095.39	36.38	1,564.34	209.18	Y	Y*
T02-01	0.00	0.00	0.00	0.00	0.00	0.00	167.95	3,872.98	0.00	0.00	167.95	Y	Y*
T02-02R	0.00	0.00	0.00	0.00	42.81	2,119.09	110.40	1,942.28	42.81	2,119.09	153.21	Y	Y*

* With time and management, these partitions have enough acreage to meet the RS foraging standard on Fort Benning

Table 6-5. Activity status of impacted red-cockaded woodpecker (RCW) clusters from 2004-2008, Alternative A (Preferred Alternative), Fort Benning, Georgia.

	2004	2005	2006	2007	2008
A06-01	PBG	PBG	PBG	PBG	PBG
A07-01	PBG	SOL	PBG	PBG	PBG
A08-01	PBG	PBG	PBG	PBG	PBG
A08-02a	PBG	PBG	PBG	PBG	PBG
A08-03	PBG	PBG	PBG	PBG	PBG
A08-04	INA	INA	INA	PBG	PBG
A09-03R	PBG	PBG	PBG	PBG	PBG
A09-04R	PBG	PBG	PBG	PBG	PBG
A09-05	PBG	PBG	PBG	PBG	PBG
A17-01	N/A	N/A	N/A	PBG	PBG
A17-02	PBG	PBG	PBG	PBG	PBG
A17-03	PBG	PBG	PBG	PBG	PBG
A17-06	PBG	PBG	PBG	PBG	PBG
A17-08	PBG	PBG	PBG	PBG	PBG
A17-11R	PBG	PBG	PBG	PBG	PBG
A17-12R	PBG	PBG	PBG	PBG	PBG
A17-13	PBG	PBG	PBG	PBG	PBG
A17-14a	PBG	PBG	PBG	PBG	PBG
A20-04	PBG	PBG	PBG	PBG	PBG
A20-06	PBG	PBG	PBG	PBG	PBG
BB03-01R	PBG	PBG	PBG	PBG	PBG
BB04-01R	PBG	PBG	PBG	PBG	PBG
BB05-01R	PBG	PBG	PBG	PBG	PBG
C01-03	PBG	PBG	PBG	PBG	PBG
C01-06	PBG	PBG	PBG	PBG	PBG
D05-02R	PBG	PBG	PBG	PBG	PBG
D05-04R	N/A	PBG	PBG	PBG	PBG
D06-01R	PBG	PBG	PBG	PBG	PBG
D08-01R	PBG	SOL	SOL	PBG	PBG
D10-01	PBG	PBG	PBG	PBG	PBG
D11-01	PBG	PBG	PBG	PBG	PBG
D11-02	PBG	PBG	PBG	PBG	PBG
D12-01	PBG	PBG	PBG	PBG	PBG
D16-01	PBG	PBG	PBG	PBG	PBG
D16-02	PBG	PBG	PBG	PBG	PBG
D17-01	PBG	PBG	PBG	PBG	PBG
D17-03	PBG	PBG	PBG	PBG	PBG
D17-04R	PBG	PBG	PBG	PBG	PBG
E02-01	PBG	PBG	PBG	PBG	PBG

PBG - potential breeding group **INA** - inactive
SOL -solitary RCW **N/A** - group does not exist or is not monitored
CAP - captured (the cluster of cavity trees of 1 group is "captured" by an adjacent group)

Table 6-5 (cont.). Activity status of impacted red-cockaded woodpecker (RCW) clusters from 2004-2008, Alternative A (Preferred Alternative), Fort Benning, Georgia.

	2004	2005	2006	2007	2008
E04-01	PBG	PBG	PBG	PBG	PBG
F02-01R	INA	SOL	PBG	PBG	PBG
HCC-08R	INA	SOL	SOL	SOL	PBG
HCC-10R	PBG	PBG	PBG	PBG	PBG
HCC-11R	CAP by A07-01	PBG	PBG	PBG	PBG
J01-02R	SOL	PBG	PBG	PBG	PBG
J02-02R	PBG	PBG	PBG	PBG	PBG
J06-03	PBG	PBG	PBG	PBG	PBG
K02-01	PBG	PBG	PBG	PBG	PBG
K08-03	PBG	PBG	PBG	PBG	PBG
K08-04	PBG	PBG	PBG	PBG	PBG
K09-01	PBG	PBG	PBG	PBG	PBG
K09-02R	PBG	PBG	PBG	PBG	PBG
K09-03R	PBG	PBG	PBG	PBG	PBG
K11-02	PBG	PBG	PBG	PBG	PBG
K11-04R	INA	INA	INA	PBG	PBG
K12-01	PBG	PBG	PBG	PBG	PBG
K13-02	PBG	PBG	PBG	PBG	PBG
K13-04	PBG	PBG	PBG	PBG	PBG
K13-05R	PBG	PBG	PBG	PBG	PBG
K13-06	PBG	PBG	PBG	PBG	PBG
K21-02R	PBG	INA	PBG	PBG	PBG
K21-05R	N/A	N/A	N/A	PBG	PBG
KPR-01	PBG	PBG	PBG	PBG	PBG
L02-02R	INA	INA	PBG	PBG	PBG
L03-01	PBG	PBG	PBG	PBG	PBG
M01-01	PBG	PBG	PBG	PBG	PBG
M08-01	PBG	PBG	PBG	PBG	PBG
M08-02a	PBG	PBG	PBG	PBG	PBG
M08-02b	N/A	PBG	PBG	PBG	PBG
M08-04R	PBG	PBG	PBG	PBG	PBG
M08-05R	PBG	PBG	PBG	SOL	PBG
N01-02	PBG	PBG	PBG	PBG	PBG
O01-01	PBG	PBG	PBG	PBG	PBG
O01-02	PBG	PBG	PBG	PBG	PBG
O01-03	PBG	PBG	PBG	CAP by 003-01	PBG
O01-04R	PBG	PBG	PBG	SOL	PBG
O02-01R	PBG	PBG	PBG	PBG	PBG
O03-01	INA	PBG	PBG	PBG	PBG

PBG - potential breeding group **INA** - inactive
SOL -solitary RCW **N/A** - group does not exist or is not monitored
CAP - captured (the cluster of cavity trees of 1 group is "captured" by an adjacent group)

Table 6-5 (cont.). Activity status of impacted red-cockaded woodpecker (RCW) clusters from 2004-2008, Alternative A (Preferred Alternative), Fort Benning, Georgia.

	2004	2005	2006	2007	2008
O03-02	PBG	PBG	PBG	PBG	PBG
O03-03	PBG	PBG	PBG	PBG	PBG
O03-04	PBG	PBG	PBG	PBG	PBG
O03-05	PBG	PBG	PBG	PBG	PBG
O03-06R	PBG	PBG	PBG	PBG	PBG
O03-07	N/A	N/A	PBG	PBG	PBG
O04-01	PBG	CAP by O04-03b	PBG	PBG	PBG
O04-03a	PBG	PBG	PBG	PBG	PBG
O04-03b	N/A	PBG	PBG	PBG	PBG
O05-01	PBG	PBG	PBG	PBG	PBG
O05-02	PBG	PBG	PBG	PBG	PBG
O05-03R	PBG	PBG	PBG	PBG	PBG
O07-01R	PBG	PBG	PBG	PBG	PBG
O07-03R	PBG	PBG	INA	PBG	PBG
O08-01	PBG	PBG	PBG	PBG	PBG
O08-02	PBG	PBG	PBG	PBG	PBG
O09-02	PBG	PBG	PBG	PBG	PBG
O10-01	PBG	PBG	PBG	PBG	PBG
O10-02	PBG	PBG	PBG	PBG	PBG
O10-03	CAP by O13-01	PBG	PBG	PBG	CAP by O13-01
O10-04	PBG	PBG	PBG	PBG	PBG
O11-01	PBG	PBG	PBG	PBG	PBG
O11-02R	INA	INA	INA	INA	PBG
O12-02	PBG	PBG	PBG	PBG	PBG
O13-01	PBG	INA	PBG	PBG	PBG
O13-02	INA	PBG	PBG	PBG	PBG
O13-06R	PBG	PBG	PBG	PBG	PBG
O14-01	PBG	PBG	PBG	PBG	PBG
O14-02	PBG	PBG	PBG	PBG	PBG
O14-03R	PBG	PBG	PBG	PBG	PBG
O15-01	PBG	PBG	PBG	PBG	PBG
O15-02	PBG	PBG	PBG	PBG	PBG
O15-03	PBG	PBG	PBG	PBG	PBG
Q02-02	PBG	PBG	PBG	PBG	PBG
Q02-04R	PBG	PBG	PBG	PBG	PBG
R02-01R	PBG	PBG	PBG	PBG	PBG
S01-01	PBG	PBG	PBG	PBG	PBG
S02-01R	PBG	PBG	PBG	PBG	PBG
S03-01R	N/A	INA	INA	PBG	PBG

PBG - potential breeding group **INA** - inactive
SOL -solitary RCW **N/A** - group does not exist or is not monitored
CAP - captured (the cluster of cavity trees of 1 group is "captured" by an adjacent group)

Table 6-5 (cont.). Activity status of impacted red-cockaded woodpecker (RCW) clusters from 2004-2008, Alternative A (Preferred Alternative), Fort Benning, Georgia.

	2004	2005	2006	2007	2008
SHC-02	PBG	PBG	PBG	SOL	SOL
T02-01	INA	INA	SOL	PBG	PBG
T02-02R	CAP BY J02-02	PBG	PBG	PBG	PBG

PBG - potential breeding group **INA** - inactive
SOL -solitary RCW **N/A** - group does not exist or is not monitored
CAP - captured (the cluster of cavity trees of 1 group is "captured" by an adjacent group)

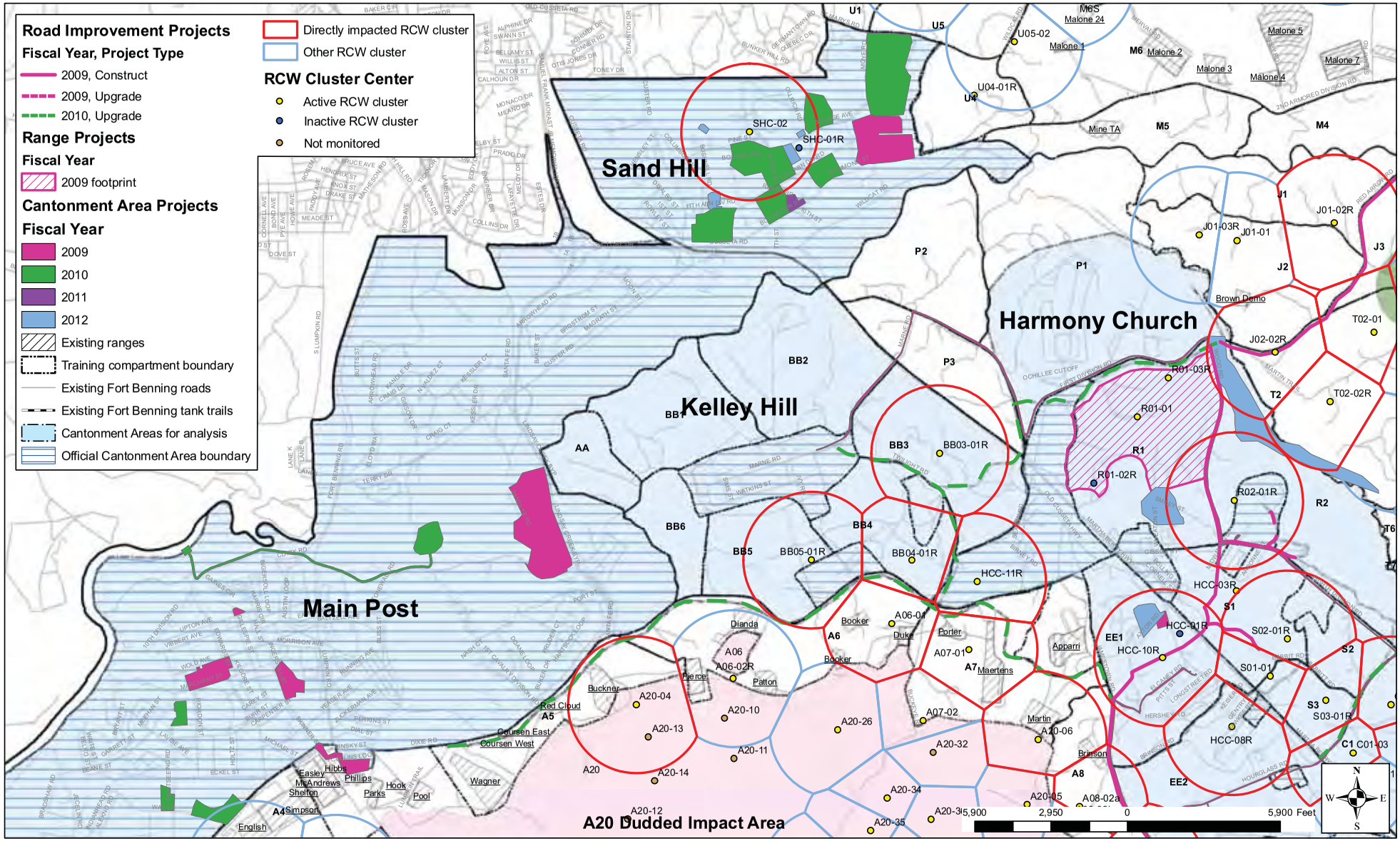


Figure 6-5. Fiscal years 2009-2012 construction activities and operational impacts for proposed projects located in the Cantonment Area for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

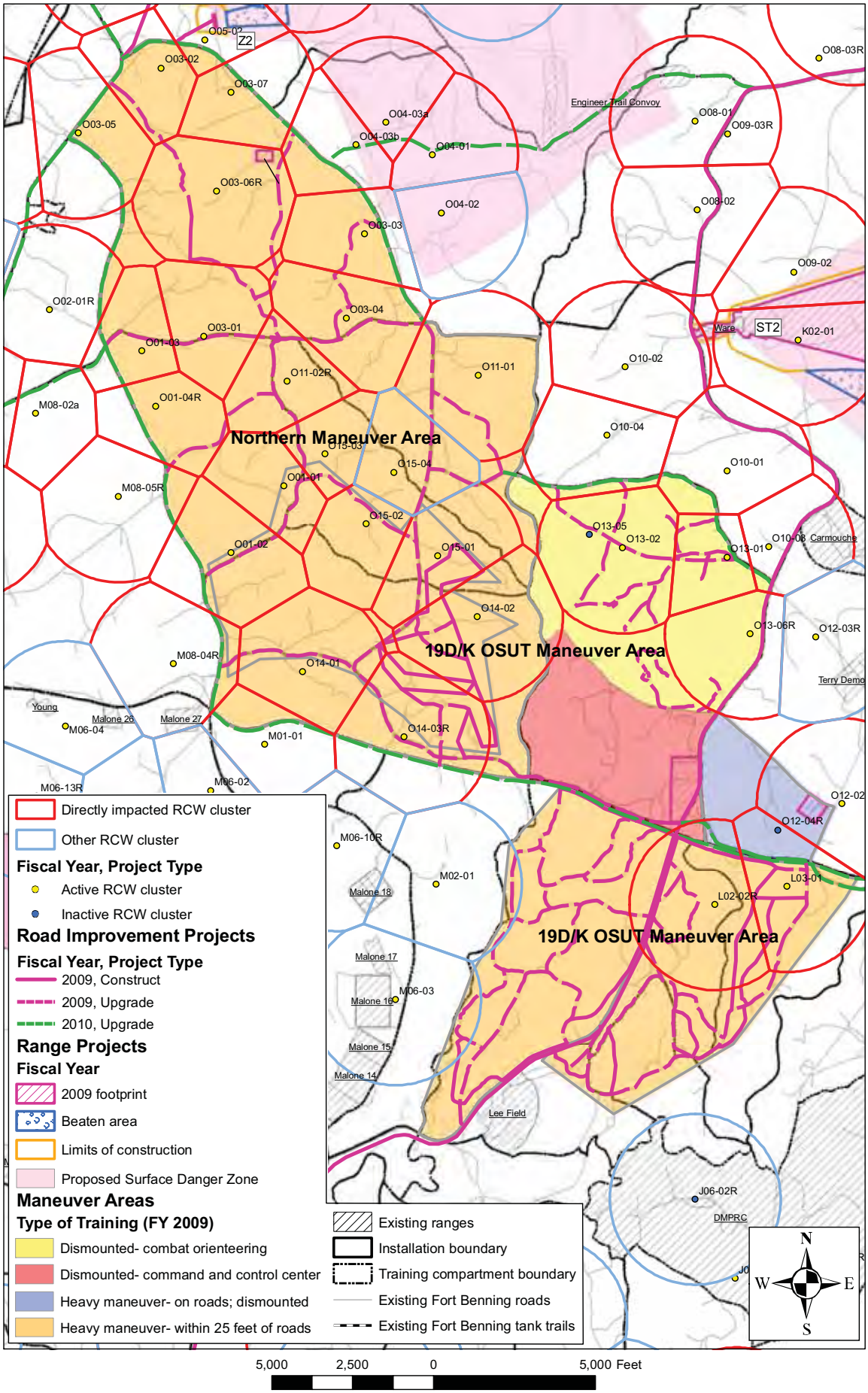


Figure 6-6. Fiscal years 2009-2010 construction activities and operational impacts for proposed projects located within red-cockaded woodpecker (RCW) clusters in the Northern Ranges for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

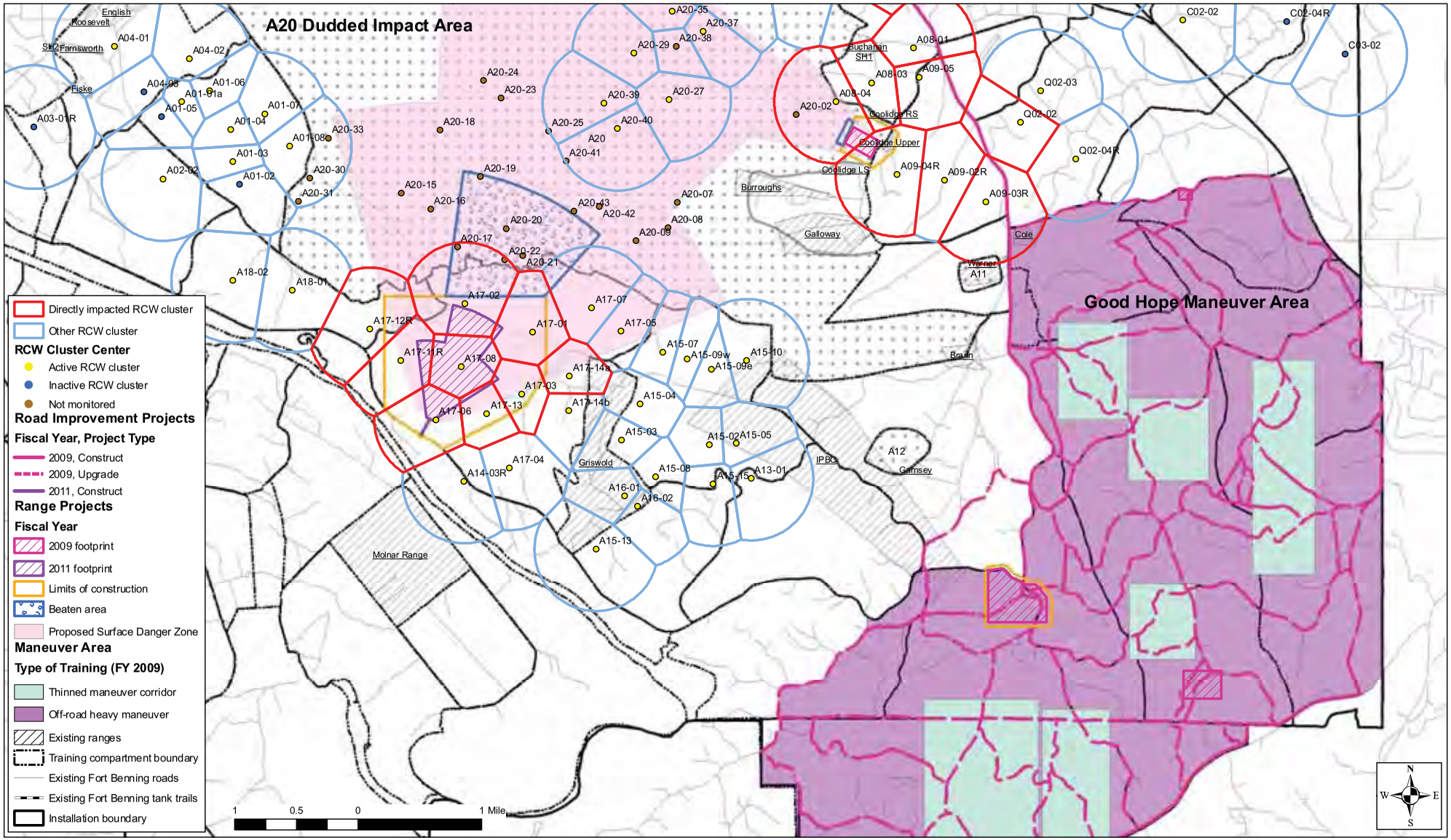


Figure 6-7. Fiscal years 2009-2011 construction activities and operational impacts for proposed projects located within red-cockaded woodpecker (RCW) clusters in the Southern Ranges for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

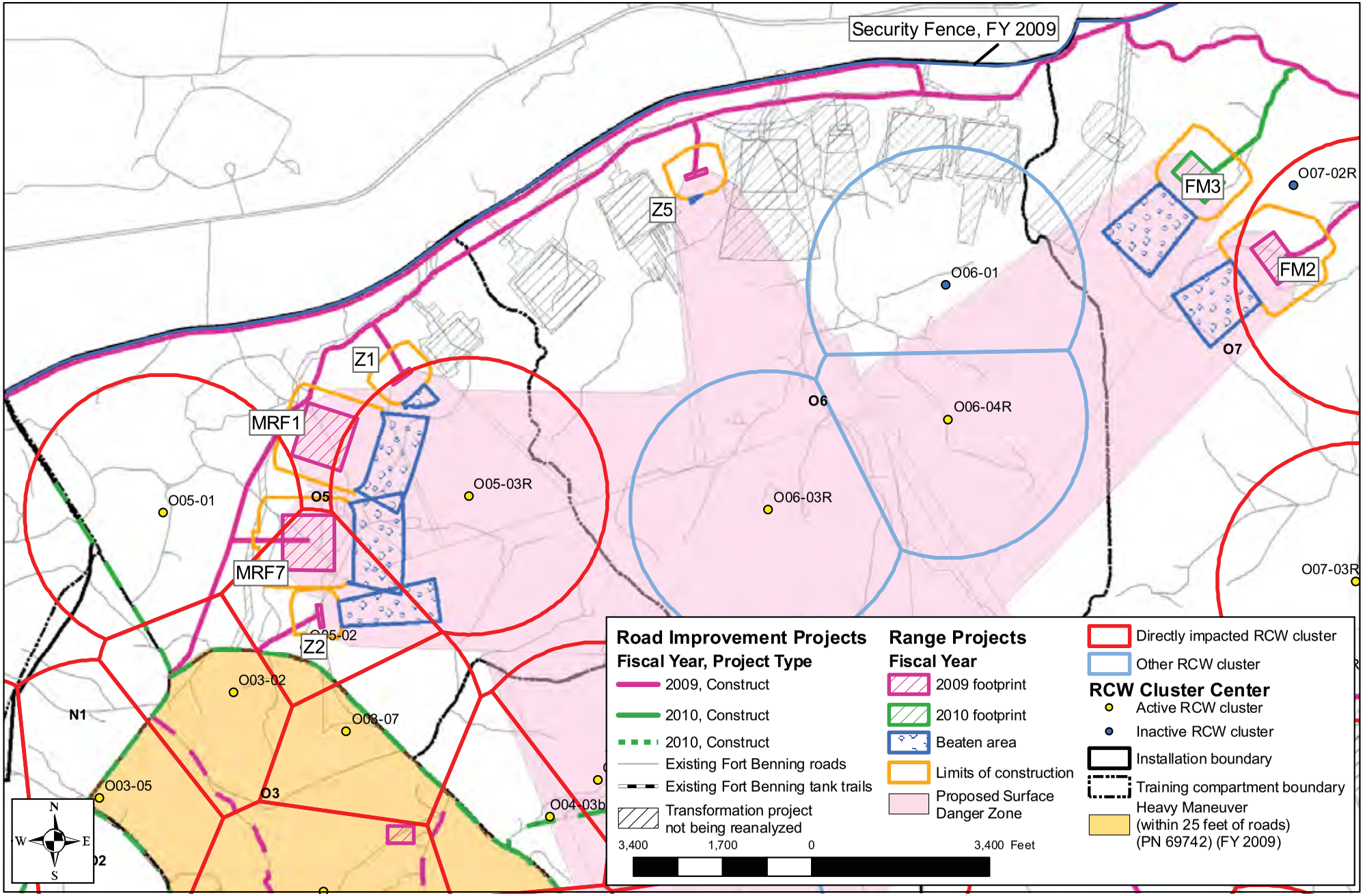


Figure 6-8. Fiscal years 2009-2010 construction activities and operational impacts for proposed projects located in the Oscar Small Arms Range Complex for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia. Also shown are the current locations of range projects analyzed in the Transformation Biological Assessment that are not being reanalyzed for this action.

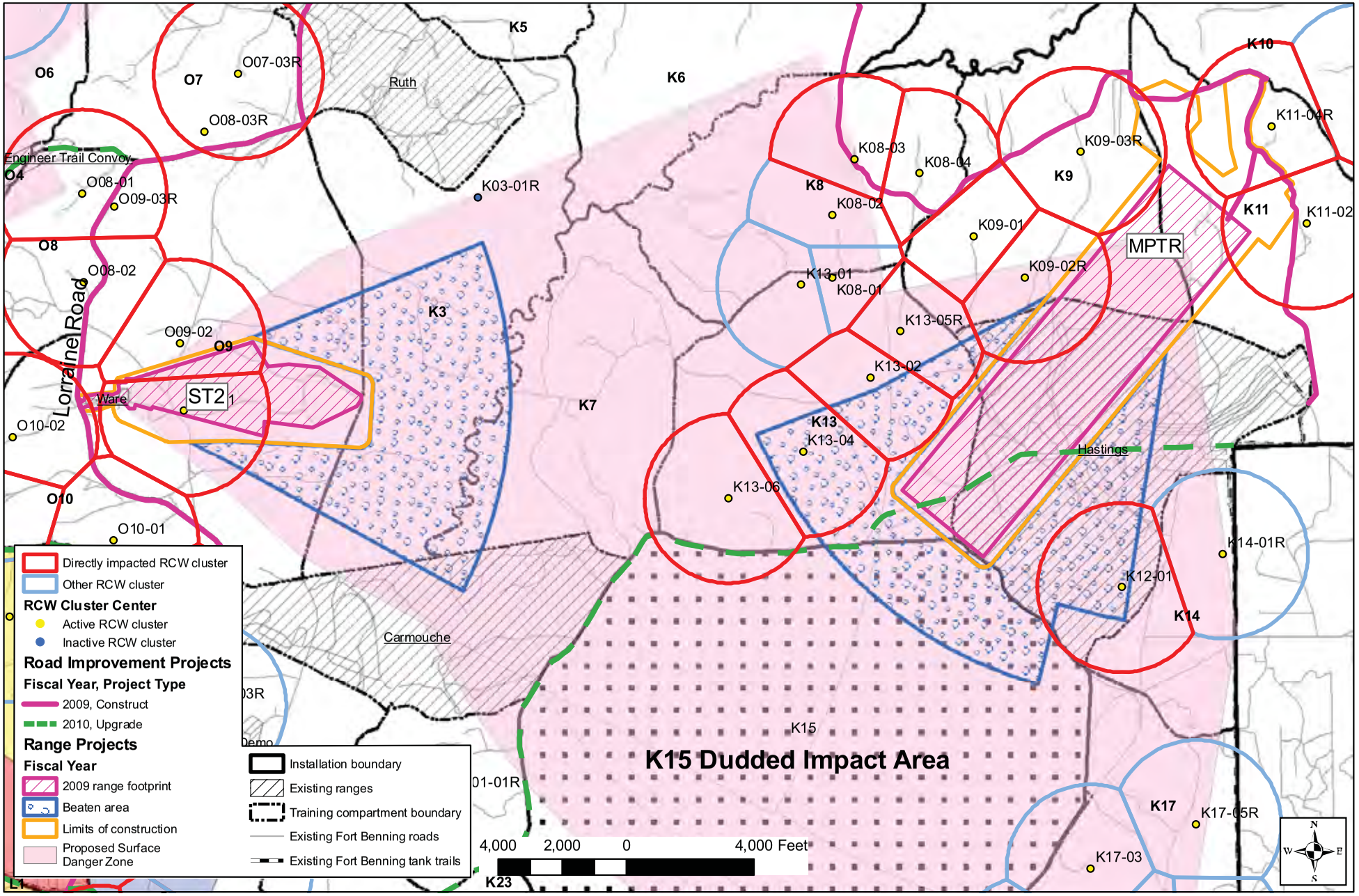


Figure 6-9. Fiscal year 2009-2010 construction activities and operational impacts for proposed projects located in the Northeastern Ranges for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

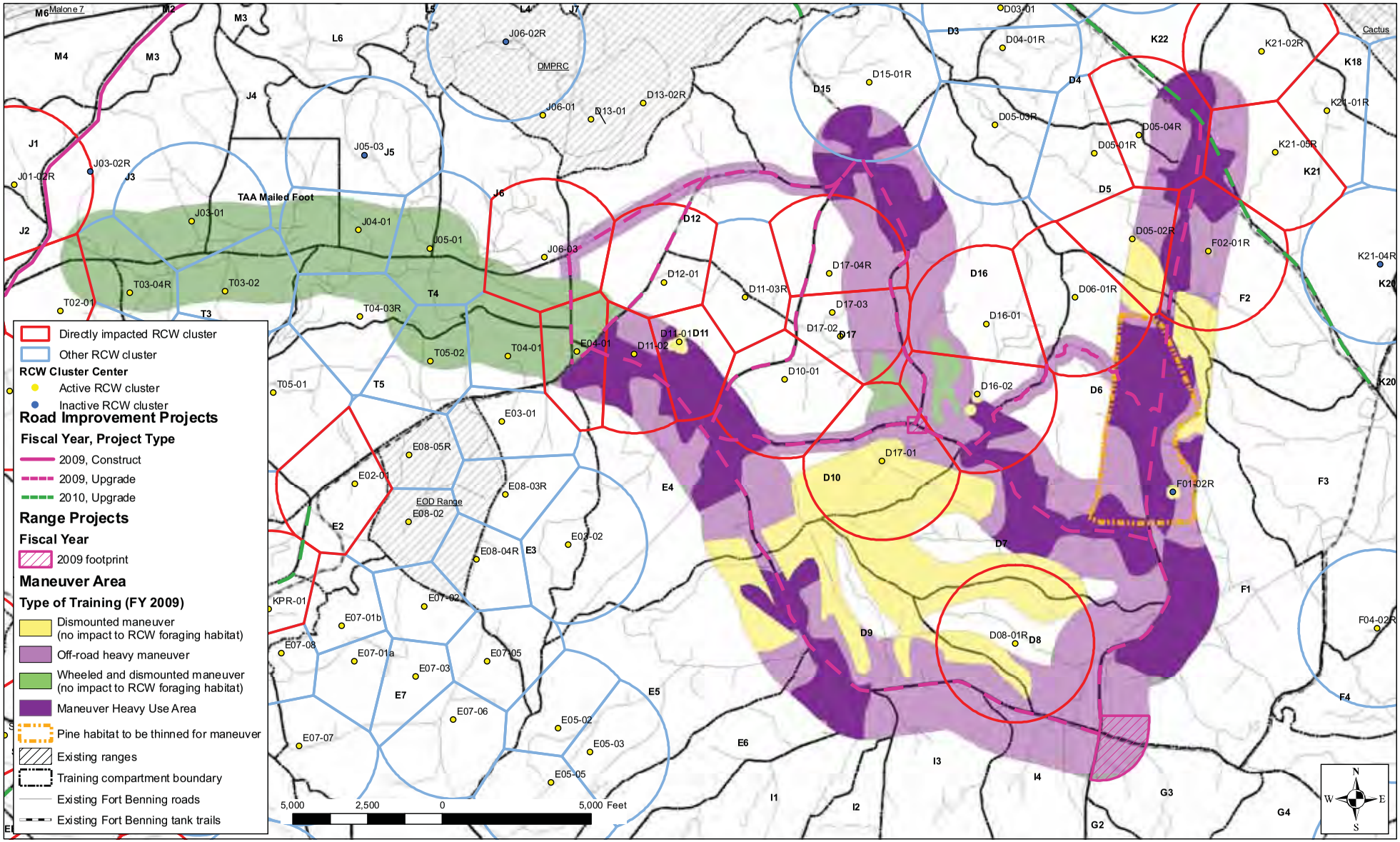


Figure 6-10. Fiscal years 2009-2010 construction activities and operational impacts for proposed projects located within red-cockaded woodpecker (RCW) clusters in the Southern Training Area for the Maneuver Center of Excellence, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Table 6-6. Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2009 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals										
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed						
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Habitat Removed Within the A20 Impact Area	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
64551	Multi-purpose Training Range (MPTR)	Northern Ranges	K09-02R	30.87	834.77	12.94	469.82	0.00	0.00	17.93	364.95	–	0	0	0	N
			K09-03R	1.47	50.63	1.47	50.63	0.00	0.00	0.00	0.00	–	0	0	0	N
	Construction Limits for MPTR		K09-02R	10.99	300.86	6.19	250.46	0.00	0.00	4.80	50.40	–	0	0	0	N
			K11-02	53.90	2,042.28	47.97	1,894.03	0.00	0.00	5.93	148.25	–	0	0	0	N
			K11-04R	56.28	1,048.55	5.60	226.80	0.00	0.00	50.68	821.75	–				
	Access Road for MPTR		K11-02	1.54	62.37	1.54	62.37	0.00	0.00	0.00	0.00	–	0	0	0	N
			K11-04R	4.26	135.33	1.86	75.33	0.00	0.00	2.40	60.00	–	0	0	0	N
64797	Access Road for Drivers Training Area	Harmony Church	R02-01R	6.11	172.38	2.68	88.44	0.00	0.00	3.43	83.94	–	0	0	0	N
65033	Fire and Movement Range (FM2)	Oscar Ranges	O07-01R	8.19	210.90	0.00	0.00	0.00	0.00	8.19	210.90	–	0	0	0	N
	Construction Limits for FM2		O07-01R	26.58	564.70	0.00	0.00	1.28	50.56	25.30	514.14	–	0	0	0	N
	Access Road for FM2		O07-01R	12.58	516.06	0.00	0.00	10.85	466.75	1.73	49.31	–	0	0	0	N
65035	Basic 10M-25M Firing Range (Z1)	Oscar Ranges	O05-03R	0.50	17.22	0.50	17.22	0.00	0.00	0.00	0.00	–	0	0	0	N
	Construction Limits for Z1		O05-03R	3.60	128.01	3.60	128.01	0.00	0.00	0.00	0.00	–	0	0	0	N
65036	Construction Limits for Basic 10M-25M Firing Range (Z2)		O05-02	4.29	149.46	2.47	109.41	0.39	13.55	1.43	26.50	–	0	0	0	N
	Access Road for Z2		O03-02	0.42	17.28	0.42	17.28	0.00	0.00	0.00	0.00	–	0	0	0	N
			O05-02	5.24	234.63	5.24	234.63	0.00	0.00	0.00	0.00	–	0	0	0	N
65043	Modified Record Fire Range (MRF1)	Oscar Ranges	O05-03R	1.62	0.00	0.00	0.00	0.00	0.00	1.62	0.00	–	0	0	0	N
	Construction Limits for Modified Record Fire Range (MRF1)		O05-01	0.71	36.34	0.00	0.00	0.00	0.00	0.71	36.34	–	0	0	0	N
			O05-03R	11.19	224.10	5.40	224.10	0.00	0.00	5.79	0.00	–	0	0	0	N
65049	Modified Record Fire Range (MRF7)	Oscar Ranges	O05-01	0.76	36.19	0.76	36.19	0.00	0.00	0.00	0.00	–				
			O05-02	16.78	614.72	2.86	136.19	0.89	83.66	13.03	394.87	–	0	0	0	N
	Construction Limits for MRF7		O05-01	8.92	488.31	7.55	359.53	1.37	128.78	0.00	0.00	–	0	0	0	N
			O05-02	12.83	587.11	9.14	435.25	0.94	88.36	2.75	63.50	–	0	0	0	N
	Access Road for MRF7		O05-01	2.29	109.05	2.29	109.05	0.00	0.00	0.00	0.00	–	0	0	0	N
65078	Anti-Armor Tracking & Live Fire Complex (LA-AR1)	Southern Ranges	A08-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.74	0	0	0	N
			A08-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.96	0	0	0	N
	Construction Limits for LA-AR1		A09-04R	17.11	427.70	0.00	0.00	0.00	0.00	17.11	427.70	–	0	0	0	N
65383	Stationary Tank Range (ST2)	Northern Ranges	K02-01	123.79	2,894.42	0.00	0.00	0.32	10.11	123.47	2,884.31	–	6	–	–	–
			O09-02	30.40	783.52	0.00	0.00	0.00	0.00	30.40	783.52	–	0	0	0	N
			O10-02	1.32	39.85	0.00	0.00	0.61	19.26	0.71	20.59	–	0	0	0	N
	Construction Limits for ST2		K02-01	39.60	899.31	0.00	0.00	0.08	2.53	39.52	896.78	–	0	0	0	N
			O09-02	12.65	316.63	0.00	0.00	0.00	0.00	12.65	316.63	–	0	0	0	N
			O10-02	1.82	55.08	0.00	0.00	0.89	28.11	0.93	26.97	–	0	0	0	N

Table 6-6 (cont.). Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2009 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals										
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed						
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Habitat Removed Within the A20 Impact Area	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
65554	Construct Training Area Roads Paved	Installation - wide	J01-02R	6.36	229.97	2.88	229.97	0.00	0.00	3.48	0.00	–	0	0	0	N
			J02-02R	16.37	500.35	4.69	199.33	0.00	0.00	11.68	301.02	–	5	3	0	N
			J06-03	10.18	400.97	10.18	400.97	0.00	0.00	0.00	0.00	–	0	0	0	N
			K08-03	12.50	434.05	12.50	434.05	0.00	0.00	0.00	0.00	–	0	0	1	N
			K08-04	15.14	565.75	13.78	525.63	0.00	0.00	1.36	40.12	–	0	0	0	N
			K09-01	3.43	110.59	1.20	44.80	0.00	0.00	2.23	65.79	–	0	0	0	N
			K09-03R	15.75	403.28	7.76	264.50	0.61	30.50	7.38	108.28	–	0	0	0	N
			K11-02	18.22	500.73	9.83	390.90	0.00	0.00	8.39	109.83	–	0	0	5	N
			K11-04R	19.23	349.11	1.83	79.61	0.00	0.00	17.40	269.50	–	0	0	0	N
			L02-02R	3.13	113.16	2.34	93.21	0.34	10.20	0.45	9.75	–	0	0	0	N
			O03-02	6.97	154.45	2.25	111.32	0.00	0.00	4.72	43.13	–	0	0	0	N
			O05-01	7.10	351.64	6.72	324.56	0.38	27.08	0.00	0.00	–	0	0	0	N
			O07-03R	20.17	582.20	9.34	349.63	0.00	0.00	10.83	232.57	–	0	0	0	N
			O08-01	12.67	321.96	3.05	96.57	0.00	0.00	9.62	225.39	–	0	0	0	N
			O08-02	17.80	516.85	3.70	131.57	0.00	0.00	14.10	385.28	–	0	0	2	N
			O10-01	13.36	314.35	0.00	0.00	4.75	221.39	8.61	92.96	–	0	0	0	N
			O10-02	8.11	231.53	2.98	119.20	0.60	18.95	4.53	93.38	–	0	0	0	N
			O10-03	11.65	328.75	0.41	15.79	7.00	237.58	4.24	75.38	–	0	0	0	N
			O13-06R	18.43	514.98	7.35	273.50	0.00	0.00	11.08	241.48	–	0	1	1	Y
			R02-01R	4.87	179.73	1.84	80.30	0.39	29.47	2.64	69.96	–	0	0	0	N
			T02-01	6.65	200.17	5.07	185.06	0.00	0.00	1.58	15.11	–	0	0	0	N
65554	Construct Training Area Roads-OSUT Maneuver Corridor	Northern Ranges	J02-02R	16.37	500.35	4.69	199.33	0.00	0.00	11.68	301.02	–	5	3	0	Y
67457	Infrastructure Support - Utilities		A08-01	2.73	75.82	1.33	52.54	0.00	0.00	1.40	23.28	–	0	0	0	N
			A08-02a	0.79	33.97	0.00	0.00	0.79	33.97	0.00	0.00	–	0	0	0	N
			C01-03	3.04	139.74	0.66	40.26	2.36	99.16	0.02	0.32	–	0	0	0	N
			C01-06	3.53	147.84	0.00	0.00	3.53	147.84	0.00	0.00	–	0	0	0	N
			HCC-08R	0.61	26.23	0.61	26.23	0.00	0.00	0.00	0.00	–	0	0	0	N
			HCC-10R	2.78	87.90	2.45	79.73	0.19	8.17	0.14	0.00	–	0	0	0	N
			R02-01R	3.91	189.16	1.77	80.22	1.08	81.60	1.06	27.34	–	0	0	0	N
			S02-01R	0.99	13.86	0.00	0.00	0.00	0.00	0.99	13.86	–	0	0	0	N
			S03-01R	1.20	51.60	0.00	0.00	1.20	51.60	0.00	0.00	–	0	0	0	N

Table 6-6 (cont.). Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2009 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals										
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed						
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Habitat Removed Within the A20 Impact Area	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
69358	Range Access Road - Good Hope MTA	Southern Ranges	A08-01	3.52	132.60	1.93	78.20	1.16	44.08	0.43	10.32	-	0	0	0	N
			A08-02a	2.30	84.50	1.80	63.00	0.50	21.50	0.00	0.00	-	0	0	0	N
			A09-03R	5.09	172.29	0.69	25.30	4.40	146.99	0.00	0.00	-	0	1	1	Y
			A09-05	4.18	150.10	3.83	140.60	0.15	4.50	0.20	5.00	-	0	1	1	Y
			HCC-10R	13.64	493.44	13.22	475.83	0.39	16.77	0.03	0.84	-	2	2	5	Y
			Q02-02	3.66	121.78	1.11	42.74	2.55	79.04	0.00	0.00	-	0	0	0	N
			S01-01	0.80	33.24	0.80	33.24	0.00	0.00	0.00	0.00	-	0	0	0	N
			S02-01R	6.80	286.32	6.80	286.32	0.00	0.00	0.00	0.00	-	0	0	0	N
69668	Good Hope Training Area Infrastructure	Southern Ranges	A09-03R	1.19	0.00	0.00	0.00	0.00	0.00	1.19	0.00	-	0	0	0	N
			Q02-04R	5.35	215.74	2.16	90.72	3.02	125.02	0.17	0.00	-	0	0	0	N
	Good Hope Maneuver Heavy Use Area	Southern Ranges	Q02-04R	6.14	265.46	0.00	0.00	6.14	265.46	0.00	0.00	-	0	0	0	N
69741	Training Area Infrastructure-19D/K OSUT	Northern Ranges	L02-02R	65.75	2,064.39	32.63	1,245.93	7.41	317.92	25.71	500.54	-	0	0	0	N
			L03-01	23.50	832.93	11.70	524.76	3.77	166.54	8.03	141.63	-	1	0	4	N
			M08-04R	3.02	66.12	1.86	61.29	0.00	0.00	1.16	4.83	-	0	0	0	N
			O10-04	3.43	114.27	0.00	0.00	3.38	114.27	0.05	0.00	-	0	0	0	N
			O12-02	9.59	201.39	0.00	0.00	0.00	0.00	9.59	201.39	-	0	0	0	N
			O13-01	25.54	733.31	1.60	61.99	5.20	192.40	18.74	478.92	-	2	1	6	Y
			O13-02	51.41	1,386.26	20.29	809.13	0.46	15.41	30.66	561.72	-	4	2	3	Y
			O14-02	25.84	757.92	9.72	505.44	0.00	0.00	16.12	252.48	-	0	0	1	N
			O14-03R	66.35	2,143.60	43.23	1,828.85	0.00	0.00	23.12	314.75	-	0	6	5	Y
69741	Training Area Infrastructure-19D/K OSUT	Northern Ranges	O15-01	28.24	581.82	6.17	215.95	0.00	0.00	22.07	365.87	-	0	1	5	Y
			O15-02	9.84	287.31	5.23	186.84	0.00	0.00	4.61	100.47	-	1	1	0	Y
			O15-03	4.79	174.99	4.79	174.99	0.00	0.00	0.00	0.00	-	0	0	0	N
69741	Training Area Infrastructure 19 D/K OSUT-Upgrade Tank Trails	Northern Ranges	O01-01	8.03	303.84	7.69	294.56	0.00	0.00	0.34	9.28	-	0	0	6	N
			O01-02	8.19	213.71	1.61	59.53	0.61	25.01	5.97	129.17	-	0	0	0	N
			O13-06R	5.78	110.22	0.00	0.00	0.00	0.00	5.78	110.22	-	0	0	0	N
			O14-01	23.98	686.85	13.99	555.39	0.00	0.00	9.99	131.46	-	2	0	1	N
69741	Tactical Training Base 19D/K OSUT	Northern Ranges	O12-02	9.59	201.39	0.00	0.00	0.00	0.00	9.59	201.39	-	0	0	0	N
69742	Northern Training Area Infrastructure	Northern Ranges	O01-01	2.31	95.33	2.31	95.33	0.00	0.00	0.00	0.00	-	0	0	0	N
			O11-01	13.63	222.46	3.38	144.54	1.46	70.92	8.79	7.00	-	0	0	0	N
			O11-02R	14.93	593.01	13.77	563.43	0.00	0.00	1.16	29.58	-	0	0	0	N
			O15-01	1.07	21.13	0.00	0.00	0.00	0.00	1.07	21.13	-	0	0	0	N
			O15-03	4.60	148.44	2.83	103.30	0.00	0.00	1.77	45.14	-	0	0	0	N

Table 6-6 (cont.). Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2009 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals										
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed						
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Habitat Removed Within the A20 Impact Area	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
69742	Northern Training Area Infrastructure-Upgrade Tank Trails	Northern Ranges	M08-05R	1.04	20.84	0.00	0.00	0.30	9.49	0.74	11.35	–	0	0	0	N
			O01-03	10.47	350.74	1.52	68.40	3.58	161.10	5.37	121.24	–	0	0	4	N
			O01-04R	10.34	300.81	6.18	220.43	0.77	31.19	3.39	49.19	–	0	0	0	N
			O03-01	11.28	331.90	1.00	40.00	4.74	167.60	5.54	124.30	–	6	1	2	Y
			O03-02	10.75	379.23	6.87	271.55	0.00	0.00	3.88	107.68	–	0	0	0	N
			O03-03	10.25	275.13	4.41	229.32	0.00	0.00	5.84	45.81	–	4	2	1	Y
			O03-04	22.92	356.64	4.05	132.38	0.00	0.00	18.87	224.26	–	0	0	5	N
			O03-06R	26.38	823.89	13.69	468.29	0.00	0.00	12.69	355.60	–	0	0	0	N
69742	Northern Training Area Infrastructure-Construct Tank Trails	Northern Ranges	O03-06R	4.94	182.22	4.94	182.22	0.00	0.00	0.00	0.00	–	0	0	0	N
	Support Staging Area	Northern Ranges	O03-06R	3.71	113.48	3.71	113.48	0.00	0.00	0.00	0.00	–	0	0	0	N
69743	Southern Training Area Infrastructure Urban Training Site	Southern Ranges	D16-02	0.24	4.92	0.00	0.00	0.00	0.00	0.24	4.92	–	0	0	0	N
			D17-01	6.74	161.17	2.63	103.46	0.00	0.00	4.11	57.71	–	0	0	0	N
69743	Southern Training Area Infrastructure - Maneuver Area	Southern Ranges	D05-02R	61.38	2,118.25	34.50	1,526.89	0.00	0.00	26.88	591.36	–	0	0	4	N
			D05-04R	127.55	4,527.36	102.40	4,223.05	0.00	0.00	25.15	304.31	–	0	0	0	N
			D06-01R	30.17	399.61	0.03	0.95	0.00	0.00	30.14	398.66	–	0	0	0	N
			D08-01R	83.72	2,618.92	46.40	1,924.82	0.00	0.00	37.32	694.10	–	0	0	0	N
			D10-01	8.59	29.05	0.00	0.00	0.00	0.00	8.59	29.05	–	0	0	0	N
			D11-01	78.96	1,795.76	46.34	1,728.40	0.00	0.00	32.62	67.36	–	0	0	0	N
			D11-02	125.66	4,032.61	82.13	3,041.24	0.00	0.00	43.53	991.37	–	7	–	–	–
69743	Southern Training Area Infrastructure - Maneuver Area	Southern Ranges	D12-01	6.74	210.13	3.44	133.46	0.00	0.00	3.30	76.67	–	0	1	2	Y
			D16-01	47.90	916.97	0.00	0.00	18.50	619.75	29.40	297.22	–	0	0	0	N
			D16-02	138.45	2,374.25	12.84	446.72	0.00	0.00	125.61	1,927.53	–	0	0	0	N
			D17-01	71.34	2,196.00	46.39	1,735.41	0.00	0.00	24.95	460.59	–	0	0	1	N
			D17-03	99.69	2,959.41	56.87	2,114.36	0.00	0.00	42.82	845.05	–	0	0	0	N
			D17-04R	79.71	2,347.45	35.73	1,306.25	0.00	0.00	43.98	1,041.20	–	0	1	3	Y
			E04-01	44.07	1,577.90	35.58	1,286.76	0.00	0.00	8.49	291.14	–	0	2	1	Y
			F02-01R	103.00	2,784.30	28.78	1,244.09	0.00	0.00	74.22	1,540.21	–	0	5	–	Y
			J06-03	21.68	786.58	17.78	671.53	0.00	0.00	3.90	115.05	–	0	0	0	N
			K21-02R	36.85	1,394.69	32.19	1,285.04	0.00	0.00	4.66	109.65	–	0	0	0	N
			K21-05R	59.24	2,375.07	59.21	2,374.50	0.00	0.00	0.03	0.57	–	0	0	0	N

Table 6-6 (cont.). Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2009 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals										
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed						
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Habitat Removed Within the A20 Impact Area	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
69743	Southern Training Area Infrastructure-Upgrade Paved Road and Tank Trails	Southern Ranges	D05-04R	9.59	385.48	8.36	372.56	0.00	0.00	1.23	12.92	–	0	0	0	N
			D06-01R	9.25	93.63	0.00	0.00	0.00	0.00	9.25	93.63	–	0	0	0	N
			D08-01R	2.22	52.73	0.00	0.00	0.00	0.00	2.22	52.73	–	0	0	0	N
			D10-01	9.30	132.04	2.50	87.75	0.00	0.00	6.80	44.29	–	0	0	2	N
			D11-01	5.53	152.47	3.52	122.63	0.00	0.00	2.01	29.84	–	0	0	0	N
			D11-02	13.79	429.55	6.78	254.82	0.00	0.00	7.01	174.73	–	0	0	0	N
			D12-01	20.19	602.11	10.43	478.49	0.00	0.00	9.76	123.62	–	0	1	2	Y
			D16-02	36.92	773.78	3.71	128.89	0.00	0.00	33.21	644.89	–	0	0	0	N
			D17-01	16.19	522.61	10.71	425.30	0.00	0.00	5.48	97.31	–	0	0	0	N
			D17-03	15.02	409.51	5.43	207.02	0.00	0.00	9.59	202.49	–	0	0	0	N
			D17-04R	17.97	557.94	7.50	311.61	0.00	0.00	10.47	246.33	–	0	0	2	N
			E04-01	15.73	725.67	13.69	666.96	0.00	0.00	2.04	58.71	–	2	2	3	Y
			F02-01R	15.78	460.56	6.19	266.17	0.00	0.00	9.59	194.39	–	0	0	0	N
			J06-03	12.43	441.25	9.03	340.95	0.00	0.00	3.40	100.30	–	0	0	0	N
72017	Vehicle Recovery Course	Harmony Church	R02-01R	21.21	774.94	18.50	619.00	2.08	145.60	0.63	10.34	–	0	0	0	N
			TOTAL:	**2,819.61**	**81,724.51**	**1,252.79**	**49,575.87**	**111.41**	**4,629.74**	**1,455.41**	**27,518.90**	**12.70**	**47**	**37**	**79**	

"–" denotes no impact because RCW cavity trees were taken by project.

Table 6-7. Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2010 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE Fort Benning, Georgia.

						SMS Foraging Habitat Removals									
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed					
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
65557	Repair Existing Trng Area Roads, Phase I	Installation - wide	A06-01	2.42	96.77	1.79	82.34	0.00	0.00	0.63	14.43	0	0	0	N
			A07-01	12.38	360.31	2.96	100.64	0.00	0.00	9.42	259.67	0	0	0	N
			A20-04	8.38	370.52	2.50	126.33	3.97	194.53	1.91	49.66	0	0	0	N
			A20-06	4.04	134.67	3.58	134.67	0.00	0.00	0.46	0.00	0	0	0	N
			BB03-01R	9.46	232.35	0.55	23.32	0.48	22.40	8.43	186.63	0	0	0	N
			BB04-01R	11.51	414.19	7.48	342.33	0.00	0.00	4.03	71.86	0	0	0	N
			BB05-01R	13.74	616.01	12.62	580.52	0.59	24.49	0.53	11.00	0	0	0	N
			C01-03	5.39	184.65	0.49	29.89	1.45	61.94	3.45	92.82	0	0	1	N
			C01-06	6.98	265.93	0.00	0.00	5.91	235.43	1.07	30.50	0	0	0	N
			D05-04	13.49	496.79	10.96	437.26	0.00	0.00	2.53	59.53				
			E02-01	2.93	71.41	1.27	39.37	0.69	22.23	0.97	9.81	0	0	0	N
			F02-01R	10.90	369.57	6.89	298.12	0.00	0.00	4.01	71.45	0	0	0	N
			HCC-10R	1.59	55.29	1.47	52.23	0.00	0.00	0.12	3.06	0	0	0	N
			HCC-11R	14.09	370.62	0.93	36.74	0.00	0.00	13.16	333.88	0	0	1	N
			K13-06	5.28	22.40	0.00	0.00	0.63	22.40	4.65	0.00	0	0	0	N
			K21-05R	9.57	396.03	9.57	396.03	0.00	0.00	0.00	0.00	0	0	0	N
			KPR-01	21.65	1,014.56	10.63	610.63	7.80	320.74	3.22	83.19	0	0	0	N
			L02-02R	9.55	222.22	0.05	2.50	0.16	4.80	9.34	214.92	0	0	0	N
			L03-01	10.31	264.77	2.64	84.52	0.00	0.00	7.67	180.25	0	0	0	N
			M01-01	3.79	127.25	1.69	75.84	0.00	0.00	2.10	51.41	0	0	0	N
			M08-01	18.35	654.17	12.05	514.03	0.00	0.00	6.30	140.14	2	1	4	Y
			M08-02a	9.16	435.87	8.66	409.12	0.50	26.75	0.00	0.00	0	0	1	N
			M08-02b	14.92	549.03	9.36	413.14	0.00	0.00	5.56	135.89	1	2	1	Y
			M08-04R	8.37	177.46	2.22	74.61	0.00	0.00	6.15	102.85	0	0	0	N
			M08-05R	7.04	149.40	0.26	9.62	1.54	47.84	5.24	91.94	0	0	0	N
			N01-02	4.36	156.85	0.98	38.22	2.36	98.23	1.02	20.40	0	0	0	N
			O01-02	11.76	311.70	4.00	148.00	0.00	0.00	7.76	163.70	0	0	0	N
			O01-03	12.71	319.28	3.57	175.63	0.76	36.10	8.38	107.55	0	0	3	N
			O01-04R	11.98	378.36	0.34	34.00	5.53	212.99	6.11	131.37	0	0	0	N
			O02-01R	18.07	459.92	7.82	315.70	1.82	70.06	8.43	74.16	0	0	0	N
			O03-02	14.01	524.64	11.23	477.53	0.00	0.00	2.78	47.11	0	0	1	N

MCOE, Fort Benning, Georgia.

Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	SMS Foraging Habitat Removals						Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed					
						Acres	BA	Acres	BA	Acres	BA				
65557	Repair Existing Trng Area Roads, Phase I	Installation - wide	O03-03	13.45	288.02	4.14	168.63	0.00	0.00	9.31	119.39	0	2	1	Y
			O03-04	4.78	105.20	1.21	44.17	0.00	0.00	3.57	61.03	0	0	0	N
			O03-05	25.70	756.92	12.74	494.48	4.93	194.74	8.03	67.70	0	2	7	Y
			O03-07	10.79	415.76	10.42	415.76	0.00	0.00	0.37	0.00	0	0	0	N
			O04-01	14.67	355.84	0.00	0.00	0.00	0.00	14.67	355.84	2	1	3	Y
			O04-03a	2.21	47.52	0.00	0.00	0.00	0.00	2.21	47.52	0	0	3	N
			O04-03b	11.52	327.24	4.37	205.39	0.00	0.00	7.15	121.85	3	2	0	Y
			O05-01	9.16	388.99	5.68	286.33	0.00	0.00	3.48	102.66	0	0	0	N
			O05-02	6.72	258.37	6.72	258.37	0.00	0.00	0.00	0.00	1	0	5	N
			O08-01	6.79	136.14	0.00	0.00	3.48	130.50	3.31	5.64	0	0	0	N
			O10-01	8.70	288.37	0.00	0.00	7.45	262.37	1.25	26.00	0	0	0	N
			O10-03	3.10	111.40	1.50	57.75	1.60	53.65	0.00	0.00	0	0	0	N
			O10-04	14.13	382.56	0.00	0.00	11.12	382.56	3.01	0.00	0	0	0	N
			O11-01	0.11	3.08	0.00	0.00	0.00	0.00	0.11	3.08	0	0	0	N
			O13-01	6.81	116.41	1.24	47.74	0.28	9.39	5.29	59.28	1	1	4	Y
			O14-03R	4.08	161.93	3.20	144.70	0.00	0.00	0.88	17.23	0	0	0	N
			S03-01R	4.02	124.28	0.00	0.00	0.92	39.56	3.10	84.72	0	0	0	N
69150	Classrooms and Dual BN Dining Facilities	Sand Hill	SHC-02	0.60	17.85	0.00	0.00	0.45	14.19	0.15	3.66	0	0	0	N
70027	Classrooms with BN Dining Facilities -GTA	Sand Hill	SHC-02	1.09	28.34	0.00	0.00	0.00	0.00	1.09	28.34	0	0	0	N
N/A	Construction Limits for MPMG Complex	Southern Ranges	A17-14a	2.64	137.28	2.64	137.28	0.00	0.00	0.00	0.00	0	0	2	N
			TOTAL:	**459.25**	**14,654.49**	**192.42**	**8,323.48**	**64.42**	**2,487.89**	**202.41**	**3,843.12**	**10**	**11**	**37**	

"–" denotes no impact because RCW cavity trees were taken by project.

Table 6-8. Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2011 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals									
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed					
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
64551	Beaten Area for Multi-purpose Training Range	Northern Ranges	K09-02R	2.51	41.37	0.77	23.10	0.00	0.00	1.74	18.27	0	0	0	N
			K12-01	45.82	1,962.37	45.82	1,962.37	0.00	0.00	0.00	0.00	6	0	1	N
			K13-02	77.31	2,916.70	58.38	2,426.42	0.00	0.00	18.93	490.28	0	0	1	N
			K13-04	93.77	2,340.61	37.00	1,207.66	24.90	1,132.95	31.87	0.00	9	–	–	–
			K13-05R	17.28	545.81	12.77	519.81	0.00	0.00	4.51	26.00	0	0	0	N
65033	Beaten Area for Fire and Movement Range (FM2)	Oscar Ranges	O07-01	2.79	79.52	0.00	0.00	0.00	0.00	2.79	79.52	0	0	0	N
65035	Beaten Area for Basic 10M-25M Firing Range (Z1)	Oscar Ranges	O05-03	1.18	48.97	1.18	48.97	0.00	0.00	0.00	0.00	0	0	0	N
65036	Beaten Area for Basic 10M-25M Firing Range (Z2)	Oscar Ranges	O05-02	10.04	291.19	4.92	185.51	0.48	16.68	4.64	89.00	0	0	0	N
			O05-03	4.44	54.96	0.00	0.00	0.16	5.56	4.28	49.40	0	0	0	N
65043	Beaten Area for Modified Record Fire Range (MRF1)	Oscar Ranges	O05-03	17.42	723.25	16.28	675.95	0.86	47.30	0.28	0.00	0	0	0	N
65049	Beaten Area for Modified Record Fire Range (MRF7)	Oscar Ranges	O05-02	10.12	401.43	0.00	0.00	4.69	162.93	5.43	238.50	0	0	0	N
			O05-03	15.50	538.88	0.00	0.00	8.46	334.62	7.04	204.26	0	0	0	N
65070	Multipurpose Machine Gun Range (MPMG2)	Southern Ranges	A17-01	3.24	200.41	3.24	200.41	0.00	0.00	0.00	0.00	0	0	0	N
			A17-02	44.86	1,412.21	21.35	1,271.91	0.00	0.00	23.51	140.30	0	0	0	N
			A17-03	1.09	56.68	1.09	56.68	0.00	0.00	0.00	0.00	0	0	0	N
			A17-06	18.21	874.85	18.21	874.85	0.00	0.00	0.00	0.00	2	0	0	N
			A17-08	114.87	6,426.31	99.91	6,341.50	0.00	0.00	14.96	84.81	5	–	–	–
			A17-11R	19.79	1,306.14	19.79	1,306.14	0.00	0.00	0.00	0.00	0	0	0	N
			A17-13	5.18	269.36	5.18	269.36	0.00	0.00	0.00	0.00	9	0	0	–
	Construction Limits for MPMG2		A17-01	93.97	4,767.06	81.93	4,303.52	12.04	463.54	0.00	0.00	5	–	–	–
			A17-02	70.22	2,083.33	37.06	1,815.94	0.00	0.00	33.16	267.39	6	–	–	–
			A17-03	70.63	3,658.75	58.65	3,059.75	11.98	599.00	0.00	0.00	10	–	–	–
			A17-06	69.42	3,048.68	69.30	3,045.60	0.00	0.00	0.12	3.08	11	–	–	–
			A17-08	15.70	799.71	11.93	778.42	0.00	0.00	3.77	21.29	0	0	0	N
			A17-11R	87.09	5,726.77	86.74	5,724.84	0.00	0.00	0.35	1.93	10	–	–	–
			A17-12R	31.22	997.83	4.75	313.50	0.00	0.00	26.47	684.33	0	0	0	N
			A17-13	62.57	3,236.04	53.77	2,796.04	8.80	440.00	0.00	0.00	10	–	–	–
	Access Road for MPMG2		A17-06	3.76	137.60	3.74	137.60	0.00	0.00	0.02	0.00	0	0	0	N

Table 6-8 (cont.). Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2011 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals									
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed					
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
65383	Beaten Area for Stationary Tank Range (ST2)	Northern Ranges	K02-01	7.74	139.91	0.00	0.00	0.08	2.48	7.66	137.43	0	0	0	N
			O09-02	1.35	25.65	0.00	0.00	0.00	0.00	1.35	25.65	0	0	0	N
			TOTAL:	**1,019.09**	**45,112.35**	**753.76**	**39,345.85**	**72.45**	**3,205.06**	**192.88**	**2,561.44**	**83**	**0**	**2**	

"–" denotes no impact because RCW cavity trees were taken by project.

Table 6-9. Direct project impacts for active red-cockaded woodpecker (RCW) clusters for Fiscal Year 2012 using the Standard for Managed Stability (SMS) (USFWS 2003a), Alternative A (Preferred Alternative) MCOE, Fort Benning, Georgia.

						SMS Foraging Habitat Removals									
						Suitable Habitat Removed		Potentially Suitable Habitat Removed		Future Potential Habitat Removed					
Project Number	Project Name	Location	Cluster Impacted	Total Acres of RCW Habitat Removed	Total BA of RCW Habitat Removed	Acres	BA	Acres	BA	Acres	BA	Cavity Trees Taken by Project	Cavity Trees With Impacts Within 50 feet	Cavity Trees With Impacts Within 51 - 200 feet	Disturbance due to Noise, Pedestrian or Vehicular Traffic (Y/N)
62953	Rail Loading Facility Expansion	Northern Ranges	T02-02R	7.61	376.70	0.00	0.00	7.61	376.70	0.00	0.00	0	0	0	N
65070	Beaten Area for Multipurpose Machine Gun Range (MPMG2)	Southern Ranges	A17-02	2.03	99.47	2.03	99.47	0.00	0.00	0.00	0.00	0	0	0	N
65246	Recreation Center, Harmony Church	Harmony Church	HCC-10R	1.12	33.60	0.00	0.00	1.12	33.60	0.00	0.00	0	0	0	N
	Recreation Center, Sand Hill	Sand Hill	SHC-02	1.89	44.77	0.00	0.00	0.00	0.00	1.89	44.77	0	0	0	N
69745	Training Barracks Complex (GTA)	Sand Hill	SHC-02	0.07	2.21	0.00	0.00	0.07	2.21	0.00	0.00	0	0	0	N
			TOTAL:	**12.72**	**556.75**	**2.03**	**99.47**	**8.80**	**412.51**	**1.89**	**44.77**	**0**	**0**	**0**	

"–" denotes no impact because RCW cavity trees were taken by project.

Table 6-10. Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative), MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	64551	Multipurpose Training Range (MPTR)	25mm, 120mm, 7.62mm, 5.56mm & .50 Cal	K09-03R	4409A	N	N	N	N	INA	4	1	
					4410A	N	N	N	N	INA	4	2	
					4411A	N	N	N	N	ACT	4	1	2008
					4412A	N	N	N	N	INA	4	2	
					5170	N	N	N	N	ACT	1	2	
					5730	N	N	N	N	ACT	1	1	
					5826A	N	N	N	N	INA	3	2	
					5900	Y	-	-	-				
	65383	Stationary Tank Range	120 mm & .50 Cal	K02-01 *	1617	Y	-	-	-	ACT	1	2	2008
					3900A	Y	-	-	-	ACT	4	1	
					3901A	Y	-	-	-	INA	4	2	
					4772A	Y	-	-	-	ACT	4	1	
					5720	Y	-	-	-	ACT	1	1	
					5871	Y	-	-	-	INA	1	1	
				O09-02	1614	N	N	N	N	INA	4	2	
					3095A	N	N	N	N	INA	4	2	
					3096A	N	N	N	N	INA	4	1	
					3098A	N	N	N	N	ACT	4	1	
					3099A	N	N	N	N	INA	4	2	
					3232	N	N	N	N	INA	2	2	
					3938	N	N	Y	N	INA	1	1	
					4836	N	N	Y	N	ACT	1	1	2007 - 2008
					5627	N	N	Y	N	ACT	2	2	2008
	65554	Construct Training Area Roads Paved		J02-02R	2683A	Y	-	-	-	INA	5	2	
					2685A	Y	-	-	-	ACT	4	1	
					2686A	N	Y	-	Y	ACT	4	1	
					2687A	Y	-	-	-	INA	4	1	
					2688A	N	Y	-	Y	ACT	4	1	
					5204	Y	-	-	-	ACT	2	2	
					5489	N	Y	-	N	INA	1	1	
					5511	N	N	N	N	ACT	1	1	2008
					5691	Y	-	-	-	ACT	1	1	
				K08-03	4967A	N	N	N	N	INA	4	1	
					4968A	N	N	N	N	ACT	4	1	
					5407	N	N	N	N	INA	1	1	
					5439	N	N	N	N	ACT	1	1	
					5440	N	N	Y	N	ACT	2	2	2008
				K11-02 *	1064	N	N	Y	N	INA	1	1	
					2595A	N	N	N	N	ACT	4	1	
					2596A	N	N	N	N	INA	4	1	
					2620A	N	N	Y	N	ACT	4	1	
					2621A	N	N	Y	N	INA	4	1	
					2737A	N	N	Y	N	ACT	4	1	
					3656	N	N	Y	N	INA	1	2	
					3688	N	N	N	N	INA	2	2	
					3788A	N	N	N	N	ACT	4	1	2008
					4852	N	N	N	N	INA	2	2	
					5211	N	N	N	N	ACT	2	2	
					5284	N	N	N	N	ACT	2	2	
					5434	N	N	N	N	ACT	1	1	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	65554	Construct Training Area Roads Paved		O08-02	3445A	N	N	N	N	ACT	4	1	
					3789	N	N	Y	N	INA	2	2	
					4768A	N	N	N	N	ACT	4	1	
					4769A	N	N	Y	N	ACT	4	1	
					5046	N	N	N	N	INA	2	2	
					5518	N	N	N	N	ACT	1	1	
					5750	N	N	N	N	ACT	2	2	
					5810	N	N	Y	N	ACT	1	1	2008
				O13-06R	1987	N	Y	-	N	INA	1	2	
					2314	N	N	N	N	ACT	2	2	
					3205A	N	N	N	N	INA	4	1	
					3206A	N	N	N	N	ACT	4	1	
					3207A	N	N	Y	N	ACT	4	1	
					3208A	N	N	N	N	ACT	4	1	2007 - 2008
					3209A	N	N	N	N	INA	5	2	
					5002A	N	N	N	N	ACT	4	1	
					5250	N	N	N	N	INA	1	2	
					5684	N	N	N	N	INA	2	2	
	69358	Range Access Road - Good Hope MTA		A09-03R	1541	N	N	N	N	INA	1	2	
					2554A	N	N	N	N	ACT	4	1	
					2563A	N	N	N	N	ACT	4	1	
					2564A	N	N	N	N	ACT	4	1	
					4197	N	N	N	N	INA	1	2	
					4456	N	N	Y	N	INA	2	2	
					4821	N	N	Y	N	INA	2	2	
					4854	N	N	N	N	ACT	1	1	2007 - 2008
					4858	N	N	N	N	INA	2	2	
					4859	N	N	N	N	INA	2	2	
				HCC-10R	4429A	N	N	Y	N	ACT	4	1	
					4430A	N	N	Y	N	INA	4	1	
					4431A	N	Y	-	Y	ACT	4	1	
					4432A	N	N	Y	N	ACT	4	1	2001-2008
					5688	Y	-	-	-	ACT	1	1	
					5689	N	N	Y	N	ACT	2	2	
					5743	N	N	N	N	INA	1	2	
					5803A	N	Y	-	Y	ACT	4	1	
					5804A	N	N	Y	N	INA	4	1	
					5805	Y	-	-	-	ACT	2	2	
	69741	Training Area Infrastructure - 19D/K OSUT		L03-01	0478	N	N	N	N	ACT	1	1	
					1947	N	N	N	N	INA	1	2	
					1948	N	N	N	N	ACT	1	1	2006 - 2008
					1949	N	N	N	N	INA	1	1	
					2319	Y	-	-	-	INA	2	2	
					3947	N	N	Y	N	INA	2	2	
					5179	N	N	Y	N	INA	2	1	
					5225	N	N	Y	N	ACT	1	2	
					5249	N	N	Y	N	INA	1	1	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	69741	Training Area Infrastructure - 19D/K OSUT		OO1-01	2000	N	N	Y	N	INA	1	1	
					2310	N	N	N	N	ACT	1	1	
					2810	N	N	N	N	INA	1	1	
					2811	N	N	Y	N	ACT	1	1	
					3240	N	N	N	N	INA	1	2	
					3262	N	N	N	N	INA	1	1	
					3642	N	N	Y	N	INA	4	2	
					3801A	N	N	N	N	INA	4	1	
					3802A	N	N	N	N	INA	1	1	
					3928	N	N	Y	N	ACT	1	1	2006 - 2008
					4842	N	N	Y	N	INA	1	1	
					5448	N	N	Y	N	ACT	1	1	
					5449	N	N	N	N	INA	1	1	
					5527	N	N	N	N	INA	2	1	
				O01-02	2923	N	Y	-	Y	ACT	2	2	
					3392	N	N	Y	N	INA	1	2	
					4086A	N	N	N	N	INA	4	1	
					4087A	N	N	N	N	INA	4	1	
					4779A	N	N	Y	N	ACT	4	1	
					5427	N	Y	-	Y	ACT	1	1	2007 - 2008
					5636	N	Y	-	Y	ACT	1	1	
				O13-01	2145	N	Y	-	N	INA	2	2	
					3120A	Y	-	-	-	INA	4	1	
					3121A	N	N	Y	N	INA	4	1	
					3122A	N	N	Y	N	ACT	4	1	
					3123A	N	N	Y	N	INA	4	1	
					5026	N	N	Y	N	ACT	2	1	
					5027	N	N	N	N	INA	1	2	
					5176	Y	-	-	-	INA	2	2	
					5177	N	N	N	N	INA	1	2	
					5198	N	N	N	N	ACT	1	1	2007 - 2008
					5530	N	N	Y	N	INA			
					5683	N	N	Y	N	ACT	1	2	
				O13-02	3103A	Y	-	-	-	ACT	4	1	
					3104A	Y	-	-	-	INA	4	1	
					3106A	N	Y	-	N	INA	4	1	
					3107A	N	N	Y	N	ACT	4	1	
					3213A	Y	-	-	-	INA	1	2	
					3214A	Y	-	-	-	ACT	6	1	2007 - 2008
					3939	N	N	Y	N	ACT	2	2	
					4003	N	Y	-	Y	ACT	1	1	
					5251	N	N	Y	N	ACT	1	1	
				O14-01	0312	N	N	Y	N	INA	1	2	
					2342	Y	-	-	-	INA	2	2	
					2343	N	N	N	N	INA	1	2	
					2344	N	N	N	N	ACT	1	1	2007 - 2008
					2345	Y	-	-	-	INA	2	2	
					2510	N	N	N	N	INA	1	1	
					2888	N	N	N	N	INA	2	2	
					3812	N	N	N	N	INA	2	2	
					4105	N	N	N	N	INA	2	2	
					4762A	N	N	N	N	ACT	4	1	
					4763A	N	N	N	N	ACT	4	1	
					5529	N	N	N	N	INA	1	1	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	69741	Training Area Infrastructure - 19D/K OSUT		O14-02	2320	N	N	N	N	INA	2	2	
					3236	N	N	N	N	ACT	1	1	
					3430	N	N	N	N	INA	2	2	
					3446A	N	N	N	N	INA	4	1	
					3703	N	N	N	N	INA	1	2	
					3715	N	N	N	N	ACT	1	1	
					3970	N	N	N	N	ACT	1	1	2008
					4507	N	N	N	N	INA	2	2	
					4508	N	N	N	N	ACT	2	2	
					4680	N	N	N	N	INA	2	2	
					4844	N	N	Y	N	INA	2	2	
					5424	N	N	N	N	INA	1	1	
					5788	N	N	N	N	ACT	1	1	
					5789	N	N	N	N	ACT	1	1	
				O14-03R	4116A	N	Y	-	Y	ACT	4	1	
					4117A	N	Y	-	N	INA	4	1	
					4118A	N	Y	-	Y	ACT	4	1	
					4119A	N	Y	-	Y	ACT	4	1	
					4274A	N	N	Y	N	ACT	4	1	2007 - 2008
					4275A	N	N	Y	N	INA	5	2	
					4759A	N	N	Y	N	INA	4	1	
					4827	N	N	Y	N	INA	1	1	
					4862	N	Y	-	N	INA	2	2	
					5234	N	Y	-	Y	ACT	2	2	
					5237	N	N	Y	N	INA	2	2	
				O15-01	1996	N	N	Y	N	INA	2	2	
					3615A	N	N	N	N	INA	4	1	
					3616A	N	N	Y	N	INA	4	2	
					4026	N	N	N	N	INA	2	2	
					4372A	N	N	Y	N	INA	4	1	
					4373A	N	N	N	N	INA	4	1	
					5554	N	N	N	N	ACT	1	1	
					5555	N	Y	-	Y	ACT	1	1	2007 - 2008
					5637	N	N	Y	N	INA	2	2	
					5638	N	N	Y	N	ACT	2	2	
					5639	N	N	N	N	ACT	2	2	
				O15-02	0785	N	N	N	N	ACT	1	1	2001 - 2008
					0814	N	N	N	N	INA	1	2	
					1568	Y	-	-	-	ACT	1	2	
					3530	N	N	N	N	ACT	1	1	
					3614A	N	N	N	N	INA	4	2	
					4021	N	N	N	N	ACT	1	1	
					4677	N	Y	-	N	INA	2	2	
	69742	Northern Training Area Infrastructure		O01-03	0105	N	N	N	N	INA	1	1	
					3456A	N	N	N	N	INA	4	2	
					4966A	N	N	N	N	INA	4	1	
					4993	N	N	Y	N	INA	1	1	
					5028	N	N	N	N	INA	1	2	
					5098	N	N	Y	N	ACT	1	2	
					5381	N	N	Y	N	INA	1	1	
					5649	N	N	Y	N	ACT	1	1	2008

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	69742	Northern Training Area Infrastructure		O03-01	0802	Y	-	-	-	INA	1	2	
					1741	N	N	Y	N	ACT	2	2	
					3716	Y	-	-	-	INA	1	2	
					4030	N	N	Y	N	INA	1	1	
					4997	Y	-	-	-	INA	2	2	
					5106A	Y	-	-	-	ACT	3	1	2005 - 2008
					5107A	Y	-	-	-	ACT	3	1	
					5520	Y	-	-	-	ACT	3	1	
					5790	N	Y	-	Y	ACT	1	1	
				O03-03	0115	Y	-	-	-	ACT	1	1	
					0116	N	Y	-	N	INA	1	2	
					2337	N	N	N	N	ACT	1	2	
					2903	Y	-	-	-	INA	2	2	
					3488	N	Y	-	Y	ACT	1	1	2007 - 2008
					3943	N	N	Y	N	INA	1	1	
					4172	Y	-	-	-	ACT	1	1	
					4570	Y	-	-	-	ACT	1	1	2008
					5078	N	N	N	N	INA	2	2	
				O03-04	0768	N	N	N	N	INA	1	1	
					1193	N	N	Y	N	INA	1	1	
					2338	N	N	N	N	INA	2	2	
					2793A	N	N	N	N	INA	4	1	
					2794A	N	N	N	N	ACT	4	1	
					2797A	N	N	Y	N	ACT	3	1	2006 - 2008
					2798A	N	N	Y	N	INA	5	2	
					2799A	N	N	Y	N	INA	5	2	
					2800A	N	N	Y	N	ACT	5	2	
					3644	N	N	N	N	INA	2	2	
	69743	Southern Training Area Infrastructure		D05-02R	4645A	N	N	Y	N	INA	4	1	
					4646A	N	N	Y	N	INA	4	1	
					4648A	N	N	N	N	ACT	4	1	
					5270A	N	N	Y	N	INA	4	1	
					5657	N	N	Y	N	ACT	1	1	2008
				D11-02 *	3852A	Y	-	-	-	ACT	4	1	
					3853A	Y	-	-	-	ACT	4	1	
					4240A	Y	-	-	-	INA	4	2	
					4517	Y	-	-	-	INA	1	1	
					5476	Y	-	-	-	INA	1	1	
					5655	Y	-	-	-	INA	1	1	
					5697	Y	-	-	-	ACT	1	1	2007 - 2008
				D17-04R	2637A	N	N	N	N	INA	4	1	
					2638A	N	N	N	N	INA	4	1	
					2639A	N	N	N	N	INA	5	2	
					2673A	N	N	N	N	ACT	1	1	
					2676A	N	N	Y	N	INA	4	1	
					4523	N	N	Y	N	INA	1	2	
					4942A	N	N	N	N	ACT	4	1	
					5012	N	N	Y	N	INA	1	1	
					5273	N	N	N	N	INA	1	2	
					5605	N	Y	-	Y	ACT	1	1	
					5865	N	N	N	N	ACT	1	1	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	69743	Southern Training Area Infrastructure		E04-01	0180	N	N	N	N	INA	1	1	
					2804	N	N	N	N	INA	1	1	
					3957	N	N	Y	N	INA	1	1	
					3958	N	Y	-	N	INA	2	2	
					4459	N	N	N	N	INA	1	1	
					5108	N	N	N	N	ACT	1	1	2008
					5109	N	N	N	N	INA	1	2	
					5185	N	Y	-	Y	ACT	1	2	
				F02-01R *	3465A	N	Y	-	Y	ACT	4	1	
					3466A	N	Y	-	Y	ACT	4	1	
					3467A	N	Y	-	Y	ACT	4	1	
					4083A	N	Y	-	Y	ACT	4	1	2008
					5681	N	Y	-	N	ACT	2	2	
	69743	Southern Training Area Infrastructure - Road		D10-01*	2327	N	N	N	N	INA	1	2	
					2823	N	N	Y	N	INA	1	1	
					2868	N	N	N	N	INA	1	1	
					4004	N	N	N	N	INA	1	1	
					4826	N	N	N	N	INA	1	2	
					5163	N	N	N	N	INA	1	1	
					5224	N	N	N	N	INA	2	2	
					5441	N	N	N	N	ACT	1	1	
					5461A	N	N	N	N	ACT	4	1	2006 - 2008
					5761A	N	N	N	N	ACT	4	1	
					5762A	N	N	Y	N	ACT	4	1	
				D12-01	2305	N	N	N	N	INA	1	1	
					2325	N	N	N	N	INA	1	1	
					2926	N	N	N	N	INA	1	2	
					3655	N	Y	-	N	INA	1	1	
					4863	N	N	Y	N	INA	1	1	
					5068	N	N	N	N	INA	2	2	
					5595	N	N	N	N	ACT	1	1	
					5763A	N	N	Y	N	ACT	4	1	2008
					5764A	N	N	N	N	INA	4	1	
				D17-04R	2637A	N	N	Y	N	INA	4	1	
					2638A	N	N	N	N	INA	4	1	
					2639A	N	N	N	N	INA	5	2	
					2673A	N	N	N	N	ACT	1	1	
					2676A	N	N	N	N	INA	4	1	
					4523	N	N	N	N	INA	1	2	
					4942A	N	N	Y	N	ACT	4	1	
					5012	N	N	N	N	INA	1	1	
					5273	N	N	N	N	INA	1	2	
					5605	N	N	N	N	ACT	1	1	
					5865	N	N	N	N	ACT	1	1	
				E04-01	0180	N	N	Y	N	INA	1	1	
					2804	N	Y	-	N	INA	1	1	
					3957	N	Y	-	N	INA	1	1	
					3958	Y	-	-	-	INA	2	2	
					4459	N	N	Y	N	INA	1	1	
					5108	N	N	Y	N	ACT	1	1	2008
					5109	Y	-	-	-	INA	1	2	
					5185	Y	-	-	-	ACT	1	2	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	72017	Vehicle Recovery Course		R01-01*	2135	Y	-	-	-	INA	1	2	
					3227	Y	-	-	-	INA	1	2	
					3360	Y	-	-	-	INA	2	2	
					4103	Y	-	-	-	INA	2	2	
					4661A	Y	-	-	-	INA	4	1	
					4662A	Y	-	-	-	INA	4	1	
					4681	Y	-	-	-	ACT	1	1	2006 - 2008
					4682	Y	-	-	-	INA	2	2	
					4975A	Y	-	-	-	ACT	4	1	
					4976A	Y	-	-	-	ACT	4	1	
					5491	Y	-	-	-	ACT	2	2	
					5740	Y	-	-	-	ACT	1	1	
				RO1-03R*	2650A	Y	-	-	-	INA	4	2	
					2652A	Y	-	-	-	INA	5	2	
					2654A	Y	-	-	-	ACT	4	1	
					2655A	Y	-	-	-	INA	5	2	
					2657A	Y	-	-	-	ACT	4	1	
					3902A	Y	-	-	-	ACT	4	1	2008
					4027	Y	-	-	-	INA	1	2	
					4691	Y	-	-	-	INA	1	2	
					4711	Y	-	-	-	INA	1	2	
					4833	Y	-	-	-	INA	1	2	
					4912	Y	-	-	-	INA	1	2	
					5054	Y	-	-	-	ACT	1	1	
					5867	Y	-	-	-	ACT	1	1	2008
			Total number of trees impacted in 2009			**69**	**34**	**82**					
2010	65557	Repair Existing Training Area Roads, Phase 1		C01-03	0124	N	N	N	N	INA	1	2	
					0587	N	N	N	N	ACT	1	1	
					0588	N	N	N	N	INA	1	2	
					1975	N	N	N	N	ACT	1	1	2008
					2151	N	N	N	N	INA	2	2	
					2856	N	N	N	N	INA	2	2	
					4764A	N	N	N	N	ACT	4	1	
					4765A	N	N	N	N	ACT	4	1	
					5382	N	N	N	N	ACT	1	1	
					5685	N	N	Y	N	ACT	2	2	
					5686	N	N	N	N	ACT	2	2	
					5744	N	N	N	N	ACT	2	2	
				HCC-11R *	4058A	N	N	N	N	INA	4	1	
					4059A	N	N	N	N	INA	4	1	
					4060A	N	N	N	N	ACT	4	1	
					4061A	N	N	N	N	ACT	4	1	
					5384	N	N	Y	N	ACT	1	1	
					5385	N	N	N	N	ACT	1	1	2005 - 2008
					5538	N	N	N	N	INA	1	1	
					5672	N	N	N	N	ACT	2	2	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2010	65557	Repair Existing Training Area Roads, Phase 1		KPR-01	2896	N	N	N	N	INA	1	1	
					3527	N	N	N	N	INA	1	2	
					3792	N	N	N	N	INA	1	2	
					3960	N	N	N	N	INA	1	1	
					4207	N	N	N	N	ACT	1	1	
					4667	N	N	N	N	INA	1	2	
					4706	N	N	N	N	INA	1	1	
					5219	N	N	N	N	INA	1	2	
					5220	N	N	N	N	INA	1	2	
					5699	N	N	N	N	ACT	1	1	
					5716	N	N	N	N	INA	1	1	
					5741	N	N	N	N	ACT	1	1	2008
					5896	N	N	N	N	ACT	1	1	
					5899	N	N	Y	N	ACT	1	1	
				M08-01	1039	Y	-	-	-	INA	1	2	
					1040	N	N	Y	N	INA	1	2	
					1884	N	N	N	N	INA	2	2	
					3349	N	N	Y	N	INA	1	1	
					4895	Y	-	-	-	INA	2	1	
					5003A	N	N	Y	N	ACT	4	1	
					5004A	N	N	N	N	INA	4	1	
					5533	N	N	Y	N	INA	1	1	
					5722	N	Y	-	Y	ACT	1	1	2008
				M08-02a	1272	N	N	N	N	ACT	2	2	
					2121	N	N	N	N	ACT	2	2	
					2123	N	N	N	N	ACT	1	1	2008
					2124	N	N	N	N	ACT	1	1	
					2270	N	N	Y	N	INA	2	2	
					3540	N	N	N	N	ACT	1	2	
					4371A	N	N	N	N	ACT	1	1	
					4374A	N	N	N	N	ACT	4	1	
					4375A	N	N	N	N	INA	4	1	
					4816	N	N	N	N	ACT	2	2	
					5635	N	N	N	N	INA	2	2	
				M08-02b	3997	N	N	Y	N	INA	1	2	
					5395	N	Y	-	Y	ACT	1	1	
					5469	Y	-	-	-	ACT	1	1	2008
					5478	N	N	N	N	ACT	2	2	
					5634	N	Y	-	N	INA	2	2	
				O01-03	0105	N	N	Y	N	INA	1	1	
					3456A	N	N	Y	N	INA	4	2	
					4966A	N	N	Y	N	INA	4	1	
					4993	N	N	N	N	INA	1	1	
					5028	N	N	N	N	INA	1	2	
					5098	N	N	N	N	ACT	1	2	
					5381	N	N	N	N	INA	1	1	
					5649	N	N	N	N	ACT	1	1	2008
				O03-02	1592	N	N	N	N	INA	1	2	
					1744	N	N	N	N	INA	2	1	
					2249	N	N	Y	N	INA	1	1	
					3436A	N	N	N	N	INA	4	1	
					3437A	N	N	N	N	INA	4	1	
					5005A	N	N	N	N	ACT	3	1	
					5420A	N	N	N	N	ACT	3	1	2006 - 2008

Activity Status
ACT Active
INA Inactive

Stage
1 Natural RCW cavity
2 Natural start
3 Drilled cavity
4 Insert cavity
5 Drilled start

1 Suitable
2 Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2010	65557	Repair Existing Training Area Roads, Phase 1		O03-03	0115	N	Y	-	Y	ACT	1	1	
					0116	N	Y	-	N	INA	1	2	
					2337	N	N	N	N	ACT	1	2	
					2903	N	N	Y	N	INA	2	2	
					3488	N	N	N	N	ACT	1	1	2007 - 2008
					3943	N	N	N	N	INA	1	1	
					4172	N	N	N	N	ACT	1	1	
					4570	N	N	N	N	ACT	1	1	2008
					5078	N	N	N	N	INA	2	2	
				O03-05	2242	N	N	Y	N	ACT	1	1	
					2243	N	N	Y	N	INA	1	1	
					2244	N	N	N	N	ACT	1	2	
					2508	N	Y	-	Y	ACT	1	2	
					2590A	N	N	Y	N	INA	4	1	
					2591A	N	N	Y	N	INA	4	1	
					2608A	N	Y	-	Y	ACT	4	1	
					2720A	N	N	Y	N	INA	5	2	
					2723A	N	N	Y	N	ACT	4	1	2006 - 2008
					4573	N	N	Y	N	INA	2	2	
				O04-01	1289	N	N	Y	N	INA	1	2	
					2003	Y	-	-	-	ACT	1	1	
					2974	N	N	N	N	ACT	1	1	
					3645	N	N	Y	N	INA	1	2	
					4595	N	Y	-	Y	ACT	1	1	2007 - 2008
					4717A	Y	-	-	-	INA	4	1	
					5632	N	N	Y	N	ACT	1	1	
				O04-03a	2111	N	N	N	N	ACT	1	2	
					2558A	N	N	N	N	INA	4	1	
					2559A	N	N	N	N	ACT	4	1	
					2560A	N	N	N	N	INA	4	1	
					3315A	N	N	N	N	INA	5	2	
					3316A	N	N	N	N	ACT	2	2	2008
					4032	N	N	Y	N	ACT	1	2	
					4596	N	N	Y	N	INA	1	2	
					4702	N	N	N	N	ACT	1	1	
					5633	N	N	Y	N	ACT	2	2	
				O04-03b	4927	N	Y	-	Y	ACT	1	1	2008
					4957	Y	-	-	-	INA	2	2	
					5061	Y	-	-	-	ACT	1	1	
					5501	N	Y	-	Y	ACT	1	1	
					5760	Y	-	-	-	ACT	2	2	
				O05-02	0770	N	N	Y	N	ACT	1	1	
					1726	Y	-	-	-	INA	1	2	
					2250	N	N	Y	N	ACT	1	1	
					2262	N	N	Y	N	ACT	1	1	2006 - 2008
					2263	N	N	Y	N	INA	1	1	
					4395A	N	N	Y	N	INA	4	1	
					4913	N	N	N	N	INA	2	2	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2010	65557	Repair Existing Training Area Roads, Phase 1		O13-01	2145	N	N	N	N	INA	2	2	
					3120A	N	N	N	N	INA	4	1	
					3121A	N	N	N	N	INA	4	1	
					3122A	N	N	Y	N	ACT	4	1	
					3123A	N	Y	-	N	INA	4	1	
					5026	N	N	Y	N	ACT	2	1	
					5027	N	N	N	N	INA	1	2	
					5176	Y	-	-	-	INA	2	2	
					5177	N	N	N	N	INA	1	2	
					5198	N	N	N	N	ACT	1	1	2007 - 2008
					5530	N	N	Y	N	INA			
					5683	N	N	Y	N	ACT	1	2	
				O14-03R	4116A	N	N	N	N	ACT	4	1	
					4117A	N	N	N	N	INA	4	1	
					4118A	N	N	N	N	ACT	4	1	
					4119A	N	N	N	N	ACT	4	1	
					4274A	N	N	N	N	ACT	4	1	2007 - 2008
					4275A	N	N	N	N	INA	5	2	
					4759A	N	N	N	N	INA	4	1	
					4827	N	N	Y	N	INA	1	1	
					4862	N	N	N	N	INA	2	2	
					5234	N	N	N	N	ACT	2	2	
					5237	N	N	N	N	INA	2	2	
			Total number of trees impacted in 2010			**10**	**11**	**37**					
2011	64551	MPTR Beaten Path	25mm, 120mm, 7.62mm, 5.56mm & .50 Cal	K12-01 *	2462	N	N	Y	N	INA	2	2	
					4690	Y	-	-	-	INA	1	2	
					4909A	Y	-	-	-	ACT	4	1	
					4910A	Y	-	-	-	ACT	4	1	
					4985A	Y	-	-	-	INA	3	1	
					4986A	Y	-	-	-	ACT	3	1	2008
					5675	Y	-	-	-	INA	1	1	
				K13-02	3514	N	N	N	N	INA	1	2	
					3544A	N	N	N	N	INA	4	2	
					4943A	N	N	N	N	ACT	4	1	
					4944A	N	N	N	N	ACT	4	1	
					4945A	N	N	Y	N	INA	4	1	
					4946A	N	N	N	N	ACT	4	1	
					5433	N	N	N	N	INA	1	1	
					5844	N	N	N	N	ACT	1	1	2008
				K13-04	3059	Y	-	-	-	INA	1	1	
					3086A	Y	-	-	-	ACT	4	1	
					3087A	Y	-	-	-	INA	4	1	
					4686	Y	-	-	-	INA	1	1	
					4687	Y	-	-	-	INA	1	1	
					4809	Y	-	-	-	ACT	1	1	2007 - 2008
					5674A	Y	-	-	-	INA	3	2	
					5678A	Y	-	-	-	ACT	4	1	
					5731	Y	-	-	-	ACT	1	1	
					5852	Y	-	-	-	ACT	1	1	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2011	65070	Multipurpose Machine Gun Range (MPMG2)	7.62mm & .50 Cal	A17-01 *	5616A	Y	-	-	-	ACT	4	1	
					5617A	Y	-	-	-	ACT	4	1	
					5618	Y	-	-	-	ACT	1	1	
					5619	Y	-	-	-	INA	1	1	
					5787	Y	-	-	-	ACT	1	1	2008
				A17-02 *	3563	Y	-	-	-	ACT	1	1	
					4329	Y	-	-	-	INA	1	1	
					4751A	Y	-	-	-	ACT	4	2	
					4752A	Y	-	-	-	INA	4	1	
					4846	Y	-	-	-	INA	1	1	
					5753	Y	-	-	-	ACT	1	1	2007 - 2008
				A17-03 *	1694	Y	-	-	-	INA	1	1	
					2192	Y	-	-	-	INA	1	1	
					4243	Y	-	-	-	ACT	1	1	
					4511	Y	-	-	-	ACT	1	1	
					4716	Y	-	-	-	INA	1	1	
					4853	Y	-	-	-	ACT	1	1	
					5071	Y	-	-	-	INA	2	2	
					5072	Y	-	-	-	INA	2	2	
					5389	Y	-	-	-	ACT	1	1	2008
					5390	Y	-	-	-	INA	2	2	
				A17-06	0320	Y	-	-	-	INA	1	1	
					2802	Y	-	-	-	INA	2	2	
					3329	Y	-	-	-	INA	1	2	
					3432	Y	-	-	-	ACT	1	1	
					3630	Y	-	-	-	INA	2	2	
					3681	Y	-	-	-	INA	2	2	
					4512	Y	-	-	-	ACT	2	2	
					4513	Y	-	-	-	ACT	1	1	
					4514	Y	-	-	-	INA	2	2	
					4515	Y	-	-	-	INA	2	2	
					4516	Y	-	-	-	ACT	1	1	
					4782	Y	-	-	-	ACT	1	1	
					5621	Y	-	-	-	ACT	1	1	2008
				A17-08	3692A	Y	-	-	-	INA	4	1	
					3949	Y	-	-	-	INA	1	1	
					4245	Y	-	-	-	ACT	1	1	
					4933	Y	-	-	-	INA	1	2	
					5073	Y	-	-	-	ACT	1	1	2007 - 2008
				A17-11R	2405	Y	-	-	-	INA	1	2	
					2545A	Y	-	-	-	ACT	4	1	
					2547A	Y	-	-	-	ACT	4	1	2007 - 2008
					2548A	Y	-	-	-	ACT	4	2	
					3308A	Y	-	-	-	INA	5	2	
					3680	Y	-	-	-	INA	1	2	
					4201	Y	-	-	-	INA	2	1	
					4560	Y	-	-	-	ACT	1	1	
					4845	Y	-	-	-	INA	2	2	
					5391	Y	-	-	-	ACT	1	1	

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-10 (cont.). Red-cockaded woodpecker cavity trees impacted within active clusters impacted by Fiscal Year 2009 - 2011 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2011	65070	Multipurpose Machine Gun Range (MPMG2)	7.62mm & .50 Cal	A17-13	3628	Y	-	-	-	INA	1	1	
					3845A	Y	-	-	-	INA	4	2	
					3846A	Y	-	-	-	INA	4	2	
					3847A	Y	-	-	-	INA	4	2	
					4234	Y	-	-	-	ACT	1	1	
					4235	Y	-	-	-	INA	1	2	
					4781A	Y	-	-	-	INA	4	2	
					4860	Y	-	-	-	ACT	1	1	
					5388	Y	-	-	-	ACT	1	1	
					5880	Y	-	-	-	ACT	1	2	2008
			Total number of trees impacted in 2011			**75**	**0**	**2**					

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

* These clusters were analyzed and "taken" by Transformation projects, but project impacts within this partition are currently being re-analyzed by MCOE projects.

Table 6-11. Red-cockaded woodpecker cavity trees impacted within inactive clusters impacted by Fiscal Year 2009 - 2012 Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Fiscal Year	Project Number	Project Name	Ammunition	Cluster Number	Cavity Tree	Tree Taken? (Yes (Y)/ No (N))	Impact within 50 feet? (Y/N)	Impact within 51 - 200 feet? (Y/N)	Harassment	Activity Status	Stage	Cavity Condition	Nest tree History
2009	65554	Construct Training Area Roads Paved		O09-03R	3768A	N	N	Y	-	INA	4	1	
					3769A	N	N	Y	-	INA	4	1	
					3770A	N	N	Y	-	INA	4	1	
					3771A	N	N	Y	-	INA	4	1	
	69358	Range Access Road - Good Hope MTA		HCC-01R	4397A	N	N	N	-	INA	4	2	
					4417A	N	N	N	-	INA	4	2	
					4418A	N	N	Y	-	INA	4	2	
	69741	Training Area Infrastructure - 19D/K OSUT		O13-05	1681	Y	-	-	-	INA	1	2	
					1956	N	N	N	-	INA	1	2	
					2497	N	N	N	-	INA	1	2	
					4666	Y	-	-	-	INA	1	1	
					4760A	Y	-	-	-	INA	4	1	
					4761A	N	N	Y	-	INA	4	1	
	69743	Southern Training Area Infrastructure - Maneuver Area		D17-02	176	N	N	N	-	INA	1	1	
					1599	N	N	N	-	INA	1	1	
					1600	N	N	Y	-	INA	1	2	
					1823	N	N	N	-	INA	1	2	
					2387	N	N	N	-	INA	1	1	
					3871	N	N	N	-	INA	1	2	
					4536	N	N	N	-	INA	2	2	
					4537	N	N	Y	-	INA	2	2	
					5604	N	N	N	-	INA	1	1	
				F01-02R	4632A	N	N	Y	-	INA	4	2	
					4633A	N	N	Y	-	INA	4	1	
					4634A	N	N	Y	-	INA	4	1	
					4635A	N	N	Y	-	INA	4	1	
	72017	Vehicle Recovery Training Area		R01-02R	2613A	Y	-	-	-	INA	4	2	
					2614A	Y	-	-	-	INA	4	2	
					2632A	Y	-	-	-	INA	4	2	
					2633A	Y	-	-	-	INA	4	2	
					5609A	N	N	Y	-	INA	4	2	
					5610A	N	N	Y	-	INA	3	1	
					5611A	N	N	Y	-	INA	4	1	
					5612A	N	N	Y	-	INA	3	1	
2012	65246	Recreation Centers, Harmony Church and SandHill		SHC-01R	3245	N	N	Y	-	INA	1	2	
			Total number of trees impacted			**7**	**0**	**17**					

Activity Status

ACT	Active
INA	Inactive

Stage

1	Natural RCW cavity	4	Insert cavity
2	Natural start	5	Drilled start
3	Drilled cavity		

Cavity Condition

1	Suitable
2	Unsuitable

Table 6-12. Red-cockaded woodpecker (RCW) groups impacted directly or indirectly using the Standard for Managed Stability (USFWS 2003a) for Fort Benning MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Impacted Cluster	Habitat Deficient Pre-Project	Total Acreage Removed by Project (Suitable/ Potentially Suitable)	# of Cavity Trees Removed	Take by Cavity Tree Loss	Take by Habitat/ Forage Loss	Take by Harassment	Group Level Take[1]	Neighborhood Level Take[1, 2]
A06-01	N	1.79	0	N	N	N	N	N
A07-01	Y	2.96	0	N	Y	-	-	-
A08-01	N	4.42	0	N	N	N	N	N
A08-02a	N	3.09	0	N	N	N	N	N
A08-03	N	0.00	0	N	N	N	N	N
A08-04	N	0.00	0	N	N	N	N	N
A09-03R	N	5.09	0	N	N	N	N	N
A09-04R	Y	0.00	0	N	N	N	N	N
A09-05	N	3.98	0	N	N	N	N	N
A17-01	N	97.21	5 of 5	Y	Y	-	-	-
A17-02	Y	60.44	6 of 6	Y	Y	-	-	-
A17-03	N	71.72	10 of 10	Y	Y	-	-	-
A17-06	N	91.25	13 of 13	Y	Y	-	-	-
A17-08	N	111.84	5 of 5	Y	Y	-	-	-
A17-11R	N	106.53	10 of 10	Y	Y	-	-	-
A17-12R	Y	4.75	0	N	Y	-	-	-
A17-13	N	67.75	10 of 10	Y	Y	-	-	-
A17-14a	N	2.64	0	N	N	N	N	N
A20-04	N	6.47	0	N	N	N	Y	-
A20-06	N	3.58	0	N	N	N	N	N
BB03-01R	Y	1.03	0	N	Y	-	-	-
BB04-01R	N	7.48	0	N	N	N	N	N
BB05-01R	N	13.21	0	N	N	N	N	N
C01-03	N	4.96	0	N	N	N	N	N
C01-06	N	9.44	0	N	N	N	N	N
D05-02R	N	34.50	0	N	N	N	N	N
D05-04R	N	121.72	0	N	N	N	N	N
D06-01R	Y	0.03	0	N	Y	-	-	-
D08-01R	N	46.40	0	N	Y	-	-	-
D10-01	Y	2.50	0	N	Y	-	-	-
D11-01	N	49.86	0	N	Y	-	-	-
D11-02	N	88.91	7 of 7	Y	Y	-	-	-
D12-01	N	13.87	0	N	N	-	-	-
D16-01	Y	18.50	0	N	Y	-	-	-
D16-02	Y	16.55	0	N	Y	-	-	-
D17-01	N	59.73	0	N	Y	-	-	-
D17-03	N	62.30	0	N	Y	-	-	-
D17-04R	N	43.23	0	N	Y	-	-	-
E02-01	N	1.96	0	N	N	N	N	N
E04-01	N	49.27	3 of 8	N	Y	-	-	-
F02-01R	Y	41.86	0	N	Y	-	-	-

Table 6-12 (cont.). Red-cockaded woodpecker (RCW) groups impacted directly or indirectly using the Standard for Managed Stability (USFWS 2003a) for Fort Benning MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Impacted Cluster	Habitat Deficient Pre-Project	Total Acreage Removed by Project (Suitable/ Potentially Suitable)	# of Cavity Trees Removed	Take by Cavity Tree Loss	Take by Habitat/ Forage Loss	Take by Harassment	Group Level Take[1]	Neighborhood Level Take[1, 2]
HCC-08R	N	0.61	0	N	N	N	N	N
HCC-10R	N	18.84	2 of 10	N	N	Y	-	-
HCC-11R	Y	0.93	0	N	Y	-	-	-
J01-02R	Y	2.88	0	N	Y	-	-	-
J02-02R	Y	4.69	5 of 9	Y	Y	-	-	-
J06-03	N	36.99	0	N	N	N	N	N
K02-01	Y	0.48	6 of 6	Y	Y	-	-	-
K08-03	N	12.50	0	N	N	N	N	N
K08-04	N	13.78	0	N	N	N	N	N
K09-01	N	1.20	0	N	N	N	N	N
K09-02R	N	19.90	0	N	N	N	N	N
K09-03R	N	9.84	1 of 8	N	N	N	N	N
K11-02	N	59.34	0	N	N	N	Y	-
K11-04R	Y	9.29	0	N	Y	-	-	-
K12-01	N	45.82	6 of 7	Y	N	-	-	-
K13-02	N	58.38	0	N	Y	-	-	-
K13-04	N	61.90	10 of 10	Y	Y	-	-	-
K13-05R	Y	12.77	0	N	Y	-	-	-
K13-06	N	0.63	0	N	N	N	Y	-
K21-02R	N	32.19	0	N	N	N	N	N
K21-05R	N	68.78	0	N	N	N	N	N
KPR-01	N	18.43	0	N	N	N	N	N
L02-02R	N	42.93	0	N	Y	-	-	-
L03-01	Y	18.11	1 of 9	N	Y	-	-	-
M01-01	Y	1.69	0	N	Y	-	-	-
M08-01	N	12.05	2 of 9	N	N	Y	-	-
M08-02a	N	9.16	0	N	N	N	N	N
M08-02b	N	9.36	1 of 5	N	N	Y	-	-
M08-04R	N	4.08	0	N	N	N	N	N
M08-05R	N	2.10	0	N	N	N	N	N
N01-02	N	3.34	0	N	N	N	N	N
O01-01	N	10.00	0	N	N	N	N	N
O01-02	Y	6.22	0	N	Y	-	-	-
O01-03	N	9.43	0	N	N	N	N	N
O01-04R	N	12.82	0	N	N	N	N	N
O02-01R	N	9.64	0	N	N	N	N	N
O03-01	Y	5.74	6 of 9	Y	Y	-	-	-
O03-02	N	20.77	0	N	N	N	N	N
O03-03	Y	8.55	4 of 9	Y	Y	-	-	-

Table 6-12 (cont.). Red-cockaded woodpecker (RCW) groups impacted directly or indirectly using the Standard for Managed Stability (USFWS 2003a) for Fort Benning MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Impacted Cluster	Habitat Deficient Pre-Project	Total Acreage Removed by Project (Suitable/ Potentially Suitable)	# of Cavity Trees Removed	Take by Cavity Tree Loss	Take by Habitat/ Forage Loss	Take by Harassment	Group Level Take[1]	Neighborhood Level Take[1, 2]
O03-04	Y	5.26	0	N	Y	-	-	-
O03-05	N	17.67	0	N	N	N	N	N
O03-06R	N	22.34	0	N	N	N	N	N
O03-07	N	10.42	0	N	N	N	N	N
O04-01	Y	0.00	2 of 7	N	Y	-	-	-
O04-03a	Y	0.00	0	N	Y	-	-	-
O04-03b	Y	4.37	3 of 5	Y	Y	-	-	-
O05-01	N	24.75	0	N	N	N	N	N
O05-02	N	38.74	1 of 7	N	Y	-	-	-
O05-03R	N	36.44	0	N	N	N	N	N
O07-01R	N	12.13	0	N	N	N	Y	-
O07-03R	N	9.34	0	N	N	N	Y	-
O08-01	Y	6.53	0	N	Y	-	-	-
O08-02	N	3.70	0	N	Y	-	-	-
O09-02	N	0.00	0	N	N	N	Y	-
O10-01	N	12.20	0	N	N	N	N	N
O10-02	Y	5.08	0	N	Y	-	-	-
O10-03	N	10.51	0	N	N	N	N	N
O10-04	N	14.50	0	N	N	N	N	N
O11-01	N	4.84	0	N	N	N	N	N
O11-02	Y	13.77	0	N	Y	-	-	-
O12-02	N	0.00	0	N	N	N	Y	-
O13-01	Y	8.32	2 of 12	N	Y	-	-	-
O13-02	N	20.75	4 of 9	N	N	Y	-	-
O13-06R	Y	7.35	0	N	Y	-	-	-
O14-01	N	13.99	2 of 12	N	N	N	N	N
O14-02	Y	9.72	0	N	Y	-	-	-
O14-03R	N	46.43	0	N	N	Y	-	-
O15-01	Y	6.17	0	N	Y	-	-	-
O15-02	Y	5.23	1 of 7	N	Y	-	-	-
O15-03	Y	7.62	0	N	Y	-	-	-
Q02-02	N	3.66	0	N	N	N	N	N
Q02-04R	N	11.32	0	N	N	N	N	N
R02-01R	N	28.34	0	N	Y	-	-	-
S01-01	N	0.80	0	N	N	N	N	N
S02-01R	N	6.80	0	N	N	N	N	N
S03-01R	Y	2.12	0	N	Y	-	-	-
SHC-02	N	0.52	0	N	N	N	Y	-
T02-01	Y	5.07	0	N	Y	-	-	-
T02-02R	Y	7.61	0	N	Y	-	-	-

Table 6-12 (cont.). Red-cockaded woodpecker (RCW) groups impacted directly or indirectly using the Standard for Managed Stability (USFWS 2003a) for Fort Benning MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Impacted Cluster	Habitat Deficient Pre-Project	Total Acreage Removed by Project (Suitable/ Potentially Suitable)	# of Cavity Trees Removed	Take by Cavity Tree Loss	Take by Habitat/ Forage Loss	Take by Harassment	Group Level Take[1]	Neighborhood Level Take[1, 2]
CLUSTER NOT IMPACTED BY MCOE PROJECTS								
D11-03R	–	–	0	–	–	–	–	Y
J01-01	–	–	0	–	–	–	–	Y
J01-03R	–	–	0	–	–	–	–	Y
K10-01R	–	–	0	–	–	–	–	Y
K11-03	–	–	0	–	–	–	–	Y
K14-01R	–	–	0	–	–	–	–	Y
O04-02	–	–	0	–	–	–	–	Y
O06-03R	–	–	0	–	–	–	–	Y
O06-04R	–	–	0	–	–	–	–	Y
TOTAL		**2,453.37**	**128**	**15**	**55**	**5**	**8**	**9**

[1] If RCW cluster is "taken" by habitat loss or cavity tree loss, it was not considered at the group or neighborhood level.

[2] Additional takes due to Neighborhood impacts are conceivable due to habitat fragmentation, reduction of productivity and dispersal impairment.

[3] This group was not considered a "take" because minimization efforts were made and no suitable or potentially suitable habitat was impacted.

Table 6-13. The number of red-cockaded woodpecker clusters requiring Incidental Takes ("Take") by the fiscal year of construction initiation, Alternative A (Preferred Alternative) Maneuver Center of Excellence projects, Fort Benning, Georgia. The **table does not include group or neighborhood takes.**

Fiscal Year "Taken"	Project Number (PN)	Project Resulting in "Take"	Clusters "Taken"
2009	64551	Mulit-purpose Training Range (MPTR)	K11-04R
	65383	Stationary Tank Range (ST2)*	K02-01***
	65554	Construct Training Area Roads Paved*	J01-02R J02-02R*** O08-01 O08-02 O10-02 O13-06R T02-01
	67457	Infrastructure Support	S03-01R
	69358	Range Access Road - Good Hope MTA*	HCC-10R****
	69741	Training Area Infrastructure-19D/K OSUT*	L02-02R L03-01 O01-02 O13-01 O13-02**** O14-02 O14-03R**** O15-01 O15-02

Table 6-13 (cont.). The number of red-cockaded woodpecker clusters requiring Incidental Takes ("Take") by the fiscal year of construction initiation, Alternative A (Preferred Alternative) Maneuver Center of Excellence projects, Fort Benning, Georgia. **The table does not include group or neighborhood takes.**

Fiscal Year "Taken"	Project Number (PN)	Project Resulting in "Take"	Clusters "Taken"
2009	69742	Northern Training Area Infrastructure	O03-01*** O03-03*** O03-04 O11-02R O15-03
	69743	Southern Training Area Infrastructure*	D06-01R D08-01R D10-01 D11-01 D11-02*** D16-01 D16-02 D17-01 D17-03 D17-04R E04-01 F02-01R
	72017	Vehicle Recovery Area	R02-01R
			Total FY 2009 = 38 Takes
2010	65557	Repair Existing Training Area Roads, Phase 1*	A07-01 BB03-01R HCC-11R M01-01 M08-01**** M08-02b****

Table 6-13 (cont.). The number of red-cockaded woodpecker clusters requiring Incidental Takes ("Take") by the fiscal year of construction initiation, Alternative A (Preferred Alternative) Maneuver Center of Excellence projects, Fort Benning, Georgia. **The table does not include group or neighborhood takes.**

Fiscal Year "Taken"	Project Number (PN)	Project Resulting in "Take"	Clusters "Taken"
2010 cont'd		Repair Existing Training Area Roads, Phase 1*	O04-01 O04-03a O04-03b*** O05-02
			Total FY 2010 = 10 Takes
2011	64551	Beaten Area MPTR	K12-01 ** K13-02 K13-04*** K13-05R
	65070	Multi-purpose Machine Gun Range (MPMG2)*	A17-01*** A17-02*** A17-03*** A17-06*** A17-08*** A17-11R*** A17-12R A17-13***
			Total FY 2011 = 12 Takes
2012	62953	Rail Loading Facility Expansion*	T02-02R
			Total FY 2012 = 1 Take

When a cluster was impacted by 2 projects in the same fiscal year, the project that removed the most habitat was considered to result in "take".

* Asterisk indicates reanalyzed Transformation projects.

** Cluster "taken" by cavity tree removal.

*** Cluster "taken" by foraging habitat and cavity tree removal.

**** Cluster "taken" by harrassment.

Table 6-14. Post- project ability of red-cockaded woodpecker (RCW) clusters "**taken**" by Alternative A (Preferred Alternative) Maneuver Center of Excellence projects to meet the Recovery Standard (RS) (USFWS 2003a) in the future, Fort Benning, Georgia. The table only lists takes by habitat/ foraging habitat loss.

Cannot Meet RS (< 120 Acres of Manageable Habitat)		**May Not Meet RS (121-149 Acres of Manageable Habitat)**	**Can meet RS (≥ 150 Acres of Manageable Habitat)**
A17-01	O04-03b	D08-01R	A07-01
A17-02	O05-02	D10-01	BB03-01R
A17-03	O11-02R	J02-02R	D16-01
A17-06	O13-01	O01-02	D17-01
A17-08	O14-02	O15-02	HCC-11R
A17-11R	O15-01	R02-01R	J01-02R
A17-12R	O15-03	S03-01R	O03-03
A17-13			O03-04
D06-01R			O08-01
D11-01			O08-02
D11-02			O10-02
D16-02			O13-06R
D17-03			T02-01
D17-04R			T02-02R
E04-01			
F02-01R			
K02-01			
K11-04R			
K13-02			
K13-04			
K13-05R			
L02-02R			
L03-01			
M01-01			
O03-01			
O04-01			
O04-03a			
TOTAL:	**34**	**7**	**14**

Table 6-15. Post- project ability of red-cockaded woodpecker (RCW) clusters **not "taken"**due to loss of foraging habitat by Alternative A (Preferred Alternative) Maneuver Center of Excellence projects to meet the Recovery Standard (RS) (USFWS 2003a) in the future, Fort Benning, Georgia.

Cannot Meet RS (< 120 Acres of Manageable Habitat)	**May Not Meet RS (121-149 Acres of Manageable Habitat)**	**Can Meet RS (≥ 150 Acres of Manageable Habitat)**	
A08-02a	A09-03R	A06-01	O05-03R
A08-03	BB04-01R	A08-01	O07-01R[2]
A17-14a	C01-03	A08-04	O07-03R[2]
C01-06	D05-04R	A09-04R	O10-01
D05-02R	HCC-10R[3]	A09-05	O12-02[2]
K08-03R	K08-04	A20-04[2]	O13-02[3]
K09-02R	K09-01	A20-06	O14-01
M08-02b[3]	M08-02a	BB05-01R	O14-03R[3]
	N01-02	D12-01	Q02-02
	O01-01	E02-01R	Q02-04R
	O01-03	HCC-08R	S02-01R
	O01-04R	J06-03	SHC-02[2]
	O03-02	K09-03R	
	O09-02[2]	K11-02[2]	
	O10-03	K12-01[1]	
	O10-04	K13-06[2]	
	O11-01	K21-02R	
	S01-01	K21-05R	
		KPR-01	
		M08-01[3]	
		M08-04R	
		M08-05R	
		O02-01R	
		O03-05	
		O03-06R	
		O03-07	
		O05-01	
TOTAL: 8	**18**	**39**	

[1]Cluster is taken to due cavity tree loss.

[2]Cluster is taken indirectly at the group level.

[3]Cluster is taken due to harrassment.

Table 6-16. Post- project suitable and potentially suitable foraging habitat using the Standard for Managed Stability (USFWS 2003) with a high risk of loblolly pine decline for red-cockaded woodpecker partitions impacted by Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Cluster	Total Suitable and Potentially Suitable Acreage	Total High Risk Suitable and Potentially Suitable Acreage	Percent of Acres With High Risk Loblolly Pine Decline
A06-01	151.85	0.00	0.00%
A07-01	32.63	11.91	36.50%
A08-01	154.85	23.46	15.15%
A08-02A	85.26	0.00	0.00%
A08-03	97.79	0.00	0.00%
A08-04	27.11	0.00	0.00%
A09-03R	114.87	13.03	11.34%
A09-04R	82.44	55.38	67.18%
A09-05	120.97	54.29	44.88%
A17-01	20.76	8.14	39.21%
A17-02	2.26	0.00	0.00%
A17-03	36.55	16.59	45.39%
A17-06	5.41	0.00	0.00%
A17-08	0.00	0.00	0.00%
A17-11R	16.79	0.00	0.00%
A17-12R	53.73	0.00	0.00%
A17-13	37.03	10.05	27.14%
A17-14A	84.01	51.51	61.31%
A20-04	88.66	13.33	15.03%
A20-06	117.97	22.54	19.11%
BB03-01R	29.00	3.50	12.07%
BB04-01R	91.71	25.28	27.57%
BB05-01R	175.45	44.28	25.24%
C01-03	85.82	17.89	20.85%
C01-06	93.13	34.64	37.20%
D05-02R	91.05	7.43	8.16%
D05-04R	122.15	60.84	49.81%
D06-01R	63.09	7.97	12.63%
D08-01R	39.61	21.69	54.76%
D10-01	45.68	22.30	48.82%
D11-01	44.15	0.00	0.00%
D11-02	0.15	0.00	0.00%
D12-01	93.01	2.91	3.13%
D16-01	38.64	0.00	0.00%
D16-02	0.00	0.00	0.00%
D17-01	84.82	70.85	83.53%
D17-03	51.79	14.35	27.71%
D17-04R	47.56	0.00	0.00%
E02-01	106.50	6.96	6.54%
E04-01	65.73	15.86	24.13%
F02-01R	11.82	0.87	7.36%
HCC-08R	96.20	21.07	21.90%
HCC-10R	113.15	27.22	24.06%
HCC-11R	10.62	1.02	9.60%
J01-02R	48.04	0.34	0.71%

Table 6-16 (cont.). Post- project suitable and potentially suitable foraging habitat using the Standard for Managed Stability (USFWS 2003) with a high risk of loblolly pine decline for red-cockaded woodpecker partitions impacted by Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Cluster	Total Suitable and Potentially Suitable Acreage	Total High Risk Suitable and Potentially Suitable Acreage	Percent of Acres With High Risk Loblolly Pine Decline
J02-02R	13.35	0.00	0.00%
J06-03	178.15	4.35	2.44%
K02-01	0.04	0.04	100.00%
K08-03	85.48	26.35	30.83%
K08-04	136.31	34.49	25.30%
K09-01	89.08	0.16	0.18%
K09-02R	107.09	0.01	0.01%
K09-03R	178.90	47.17	26.37%
K11-02	164.98	22.53	13.66%
K11-04R	37.21	2.65	7.12%
K12-01	91.29	8.64	9.46%
K13-02	41.60	8.64	20.77%
K13-04	32.91	15.46	46.98%
K13-05R	42.30	1.30	3.07%
K13-06	162.60	57.20	35.18%
K21-02R	142.83	0.39	0.27%
K21-05R	176.60	1.26	0.71%
KPR-01	131.35	83.35	63.46%
L02-02R	76.67	0.59	0.77%
L03-01	32.38	4.69	14.48%
M01-01	46.62	2.61	5.60%
M08-01	123.04	30.10	24.46%
M08-02a	131.73	10.10	7.67%
M08-02b	76.98	1.14	1.48%
M08-04R	91.13	33.10	36.32%
M08-05R	176.68	69.64	39.42%
N01-02	91.25	40.38	44.25%
O01-01	129.07	23.74	18.39%
O01-02	29.99	1.75	5.84%
O01-03	100.32	32.14	32.04%
O01-04R	108.75	17.11	15.73%
O02-01R	106.35	3.56	3.35%
O03-01	40.53	9.50	23.44%
O03-02	95.65	1.48	1.55%
O03-03	37.27	14.72	39.50%
O03-04	31.10	11.54	37.11%
O03-05	178.80	45.57	25.49%
O03-06R	99.98	34.60	34.61%
O03-07	111.96	49.92	44.59%
O04-01	0.00	0.00	0.00%
O04-03a	0.00	0.00	0.00%
O04-03b	21.81	1.18	5.41%
O05-01	204.13	48.42	23.72%
O05-02	61.60	1.87	3.04%
O05-03R	157.13	32.07	20.41%

Table 6-16 (cont.). Post- project suitable and potentially suitable foraging habitat using the Standard for Managed Stability (USFWS 2003) with a high risk of loblolly pine decline for red-cockaded woodpecker partitions impacted by Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

Cluster	Total Suitable and Potentially Suitable Acreage	Total High Risk Suitable and Potentially Suitable Acreage	Percent of Acres With High Risk Loblolly Pine Decline
O07-01R	119.61	80.09	66.96%
O07-03R	139.16	117.96	84.77%
O08-01	29.89	14.94	49.98%
O08-02	73.99	32.54	43.98%
O09-02	77.14	14.39	18.65%
O10-01	100.26	66.20	66.03%
O10-02	69.70	43.83	62.88%
O10-03	101.42	53.57	52.82%
O10-04	124.76	80.17	64.26%
O11-01	75.00	19.24	25.65%
O11-02R	57.73	6.75	11.69%
O12-02	109.00	39.40	36.15%
O13-01	50.22	35.77	71.23%
O13-02	82.55	33.65	40.76%
O13-06R	67.06	41.16	61.38%
O14-01	106.56	19.23	18.05%
O14-02	25.99	0.00	0.00%
O14-03R	109.05	60.65	55.62%
O15-01	27.04	2.47	9.13%
O15-02	66.54	0.18	0.27%
O15-03	60.43	23.09	38.21%
Q02-02	150.27	80.06	53.28%
Q02-04R	125.12	69.74	55.74%
R02-01R	72.40	14.64	20.22%
S01-01	126.43	42.24	33.41%
S02-01R	113.79	40.07	35.21%
S03-01R	44.02	14.69	33.37%
SHC-02	153.18	76.38	49.86%
T02-01	24.20	23.34	96.45%
T02-02R	50.12	40.53	80.87%

cluster is taken by Alternative A Transformation

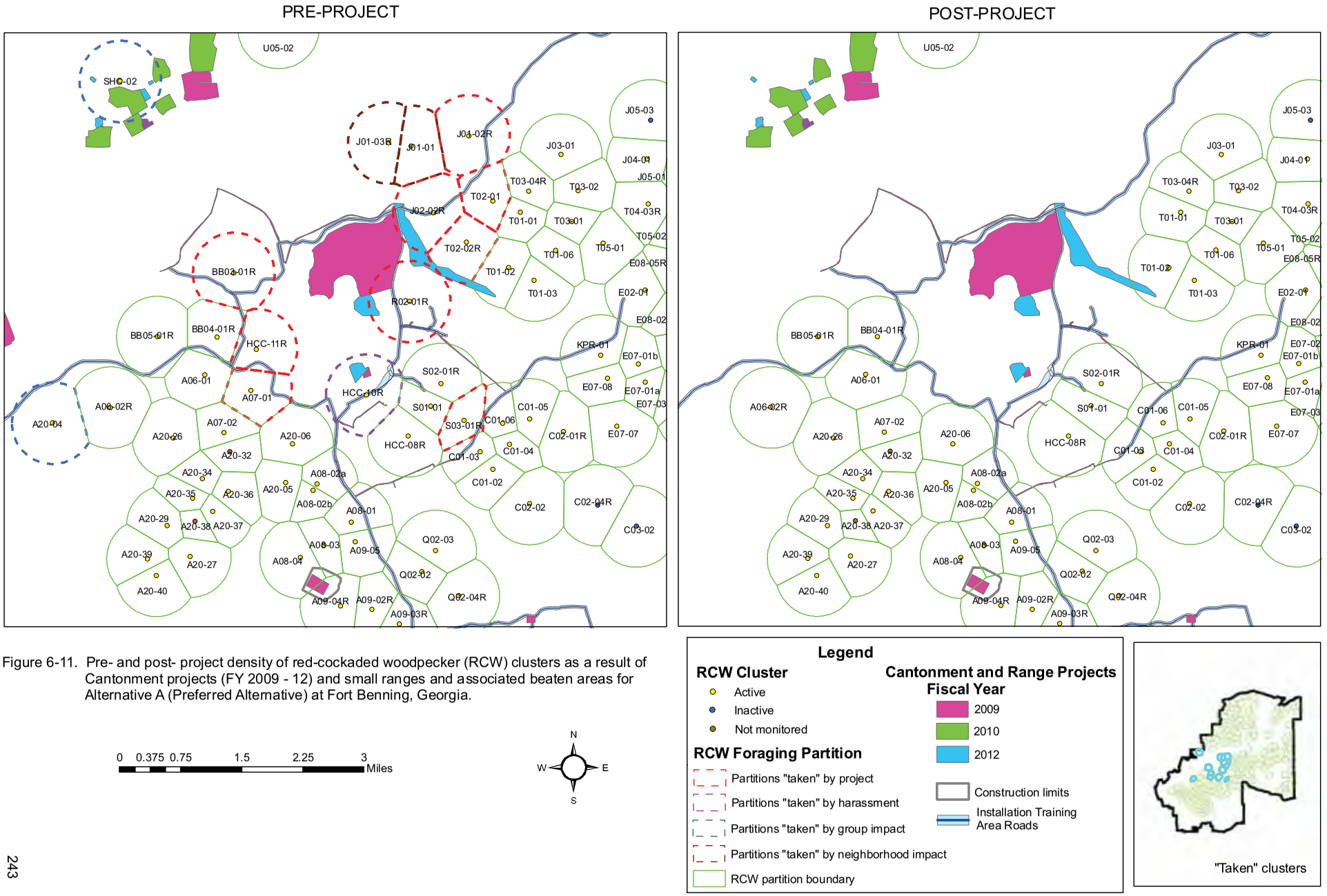


Figure 6-11. Pre- and post- project density of red-cockaded woodpecker (RCW) clusters as a result of Cantonment projects (FY 2009 - 12) and small ranges and associated beaten areas for Alternative A (Preferred Alternative) at Fort Benning, Georgia.

PRE-PROJECT

POST-PROJECT

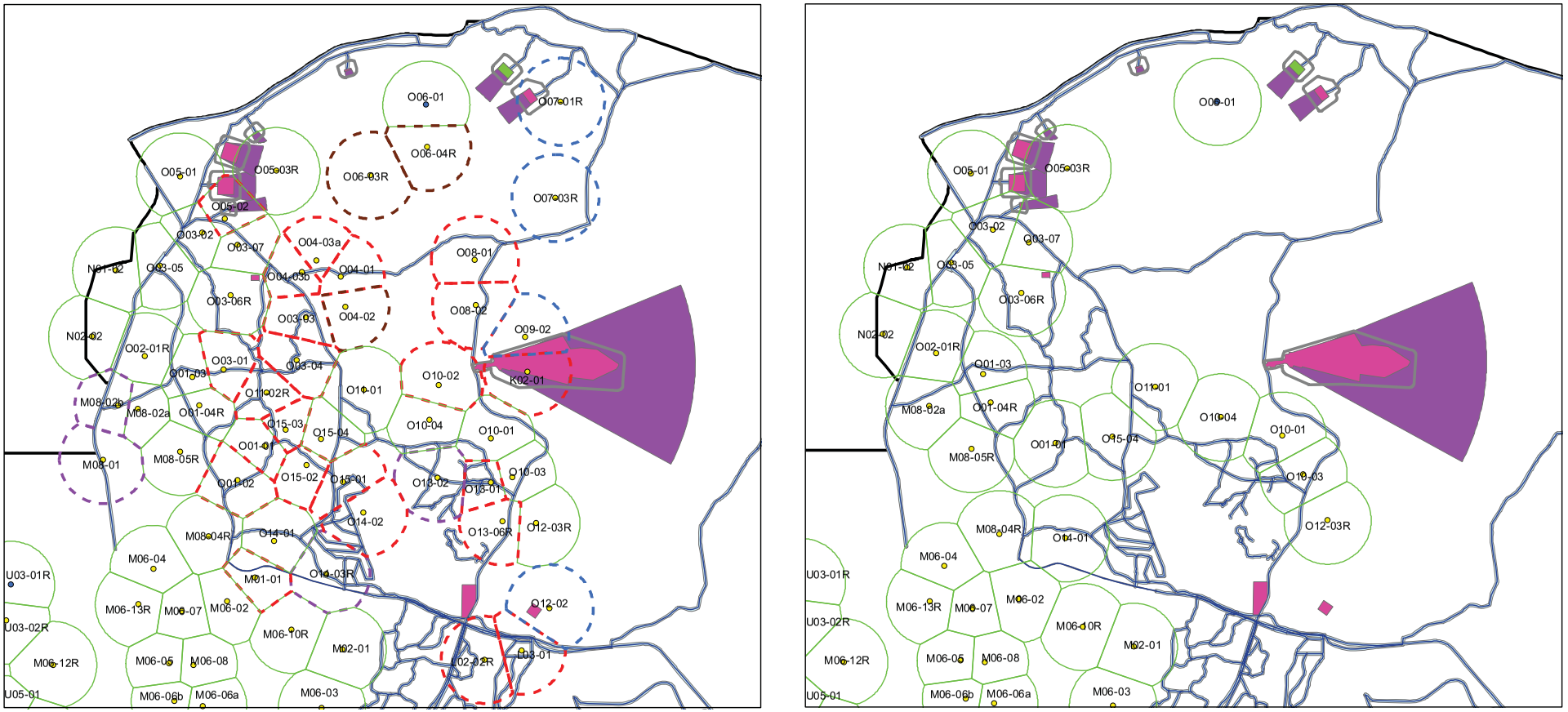


Figure 6-12. Pre- and post- project density of red-cockaded woodpecker (RCW) clusters as a result of Installation Training Area Roads and Northern Ranges, Alternative A (Preferred Alternative) Fort Benning, Georgia.

0 0.45 0.9 1.8 2.7 3.6 Miles

N W E S

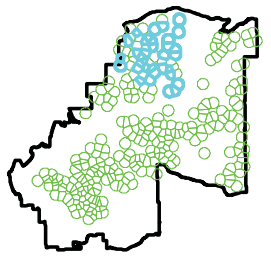
Legend

RCW Cluster
- Active
- Inactive
- Not monitored

RCW Foraging Partition
- Partitions "taken" by project
- Partitions "taken" by harassment
- Partitions "taken" by group impact
- Partitions "taken" by neighborhood impact
- RCW partition boundary

Northern Ranges Fiscal Year
- 2009
- 2010
- 2011

- Construction limits
- Installation Training Area Roads
- Fort Benning boundary



"Taken" clusters

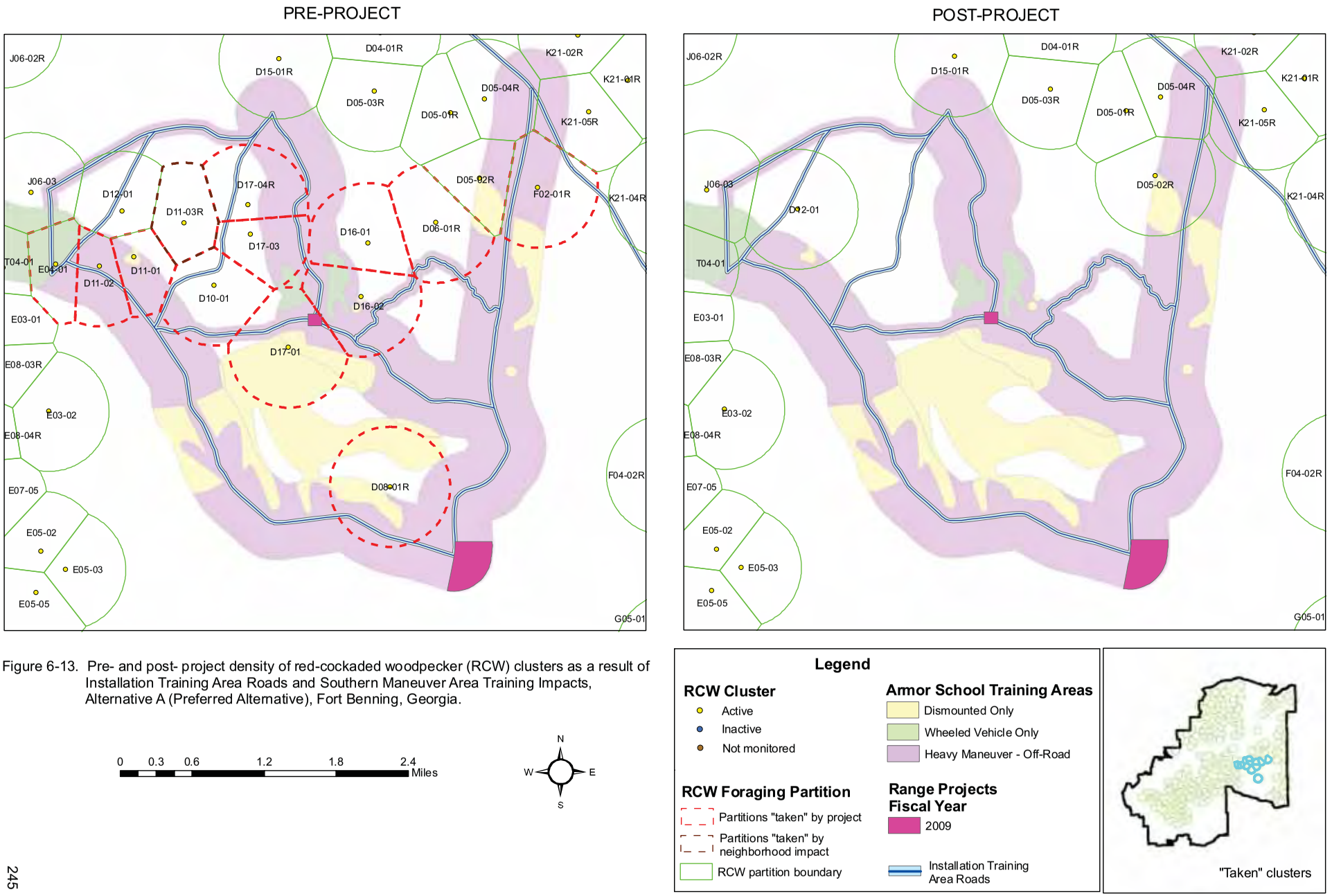


Figure 6-13. Pre- and post- project density of red-cockaded woodpecker (RCW) clusters as a result of Installation Training Area Roads and Southern Maneuver Area Training Impacts, Alternative A (Preferred Alternative), Fort Benning, Georgia.

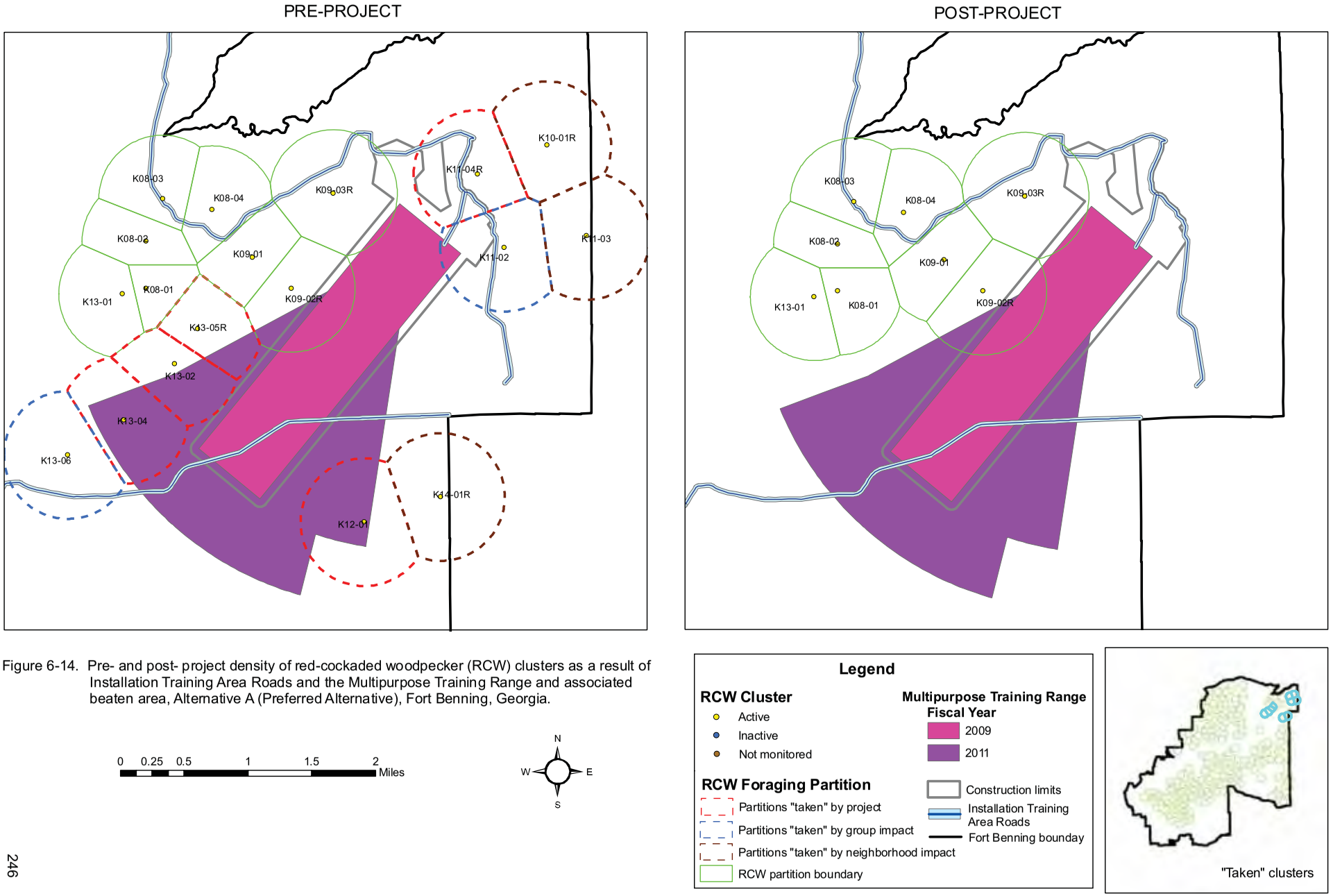


Figure 6-14. Pre- and post- project density of red-cockaded woodpecker (RCW) clusters as a result of Installation Training Area Roads and the Multipurpose Training Range and associated beaten area, Alternative A (Preferred Alternative), Fort Benning, Georgia.

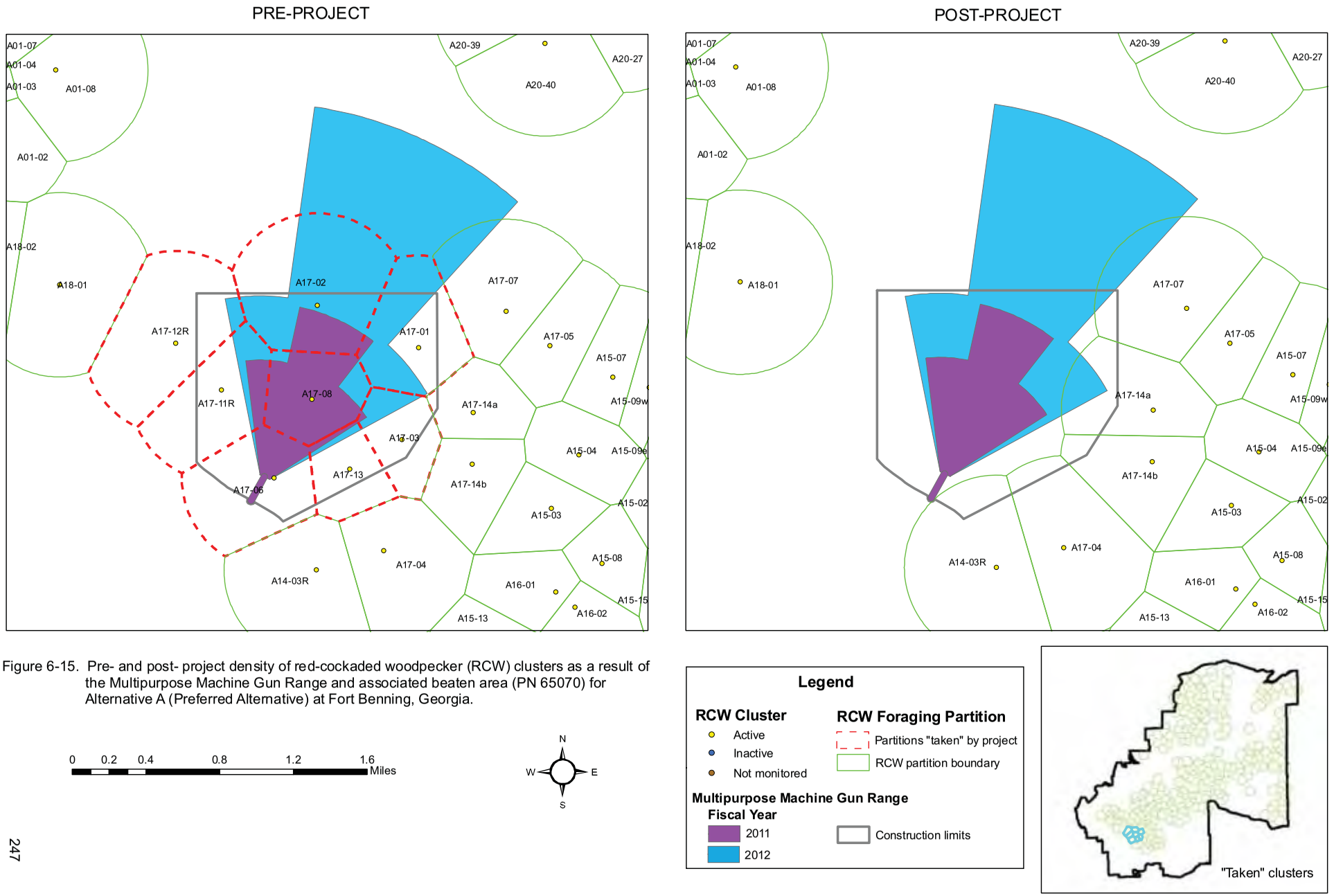


Figure 6-15. Pre- and post- project density of red-cockaded woodpecker (RCW) clusters as a result of the Multipurpose Machine Gun Range and associated beaten area (PN 65070) for Alternative A (Preferred Alternative) at Fort Benning, Georgia.

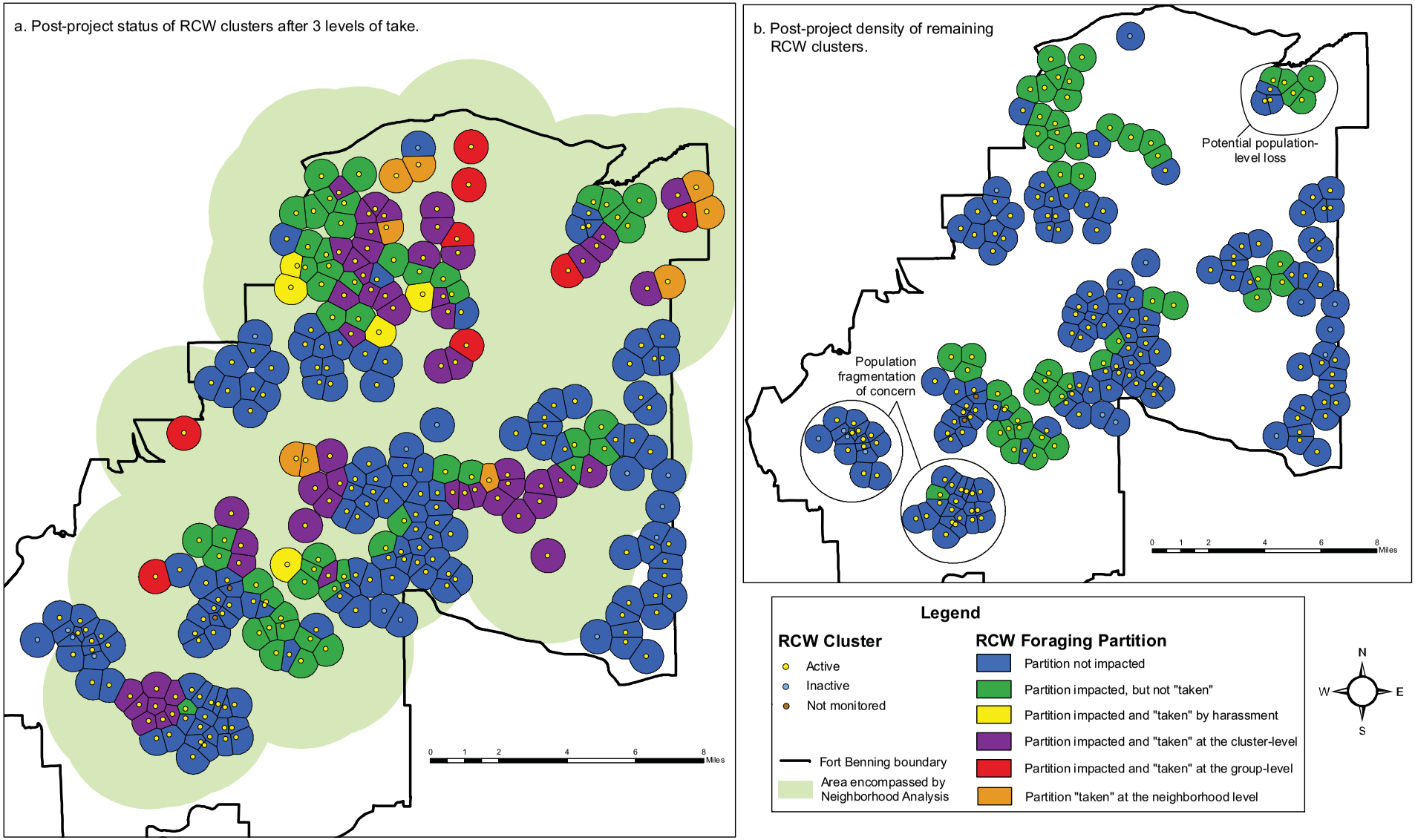


Figure 6-16. (a.) Post-project status of red-cockaded woodpecker (RCW) clusters after cluster, group (1.25 mile radius) and neighborhood (2.57 radius) analyses and (b.) post-project density of RCW clusters, Alternative A (Preferred Alternative), Fort Benning, Georgia.

FB Cluster A06-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 12 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 7,067.44 ft^2 of pine BA on 153.64 acres of suitable habitat and 734.22 ft^2 of pine BA on 33.72 acres of future potential habitat. There were 35.23 acres of forested habitat within the A20 Impact Area. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 7,801.66 ft^2 of pine BA on 187.36 acres of future potential habitat. There were 35.23 acres of forested habitat within the A20 Impact Area. There was no suitable or potentially suitable habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 96.77 ft^2 of pine BA on 2.42 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 6,985.10 ft^2 of pine BA on 151.85 acres of suitable habitat and 719.79 ft^2 of pine BA on 33.09 acres of future potential habitat. There were 35.23 acres of forested habitat within the A20 Impact Area. There was no potentially suitable habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 7,704.89 ft^2 of pine BA on 184.94 acres of future potential habitat. There were 35.23 acres of forested habitat within the A20 Impact Area. There was no suitable or potentially suitable habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

FB Cluster A07-01: This cluster had a PBG in 2004 and 2006 to 2008; there was a solitary male in 2005 (Table 6-5). There were 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,313.44 ft^2 of pine BA on 35.59 acres of suitable habitat and 4,009.86 ft^2 of pine BA on 147.44 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 90.62 ft^2 of pine BA on 1.97 acres of potentially suitable habitat and 5,232.68 ft^2 of pine BA on 181.06 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 360.31 ft^2 of pine BA on 12.38 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 1,212.80 ft^2 of pine BA on 32.63 acres of suitable habitat and 3,750.19 ft^2 of pine BA on 138.02 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 36.50% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 90.62 ft^2 of pine BA on 1.97 acres of potentially suitable habitat and 4,872.37 ft^2 of pine BA on 168.68 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster A08-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,648.57 ft^2 of pine BA on 113.80 acres of suitable habitat, 1,709.06 ft^2 of pine BA on 45.47 acres of potentially suitable habitat and 377.04 ft^2 of pine BA on 27.96 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 6,734.67 ft^2 of pine BA on 187.23 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-4).

The 2009 Infrastructure Support - Utilities (PN 67457) will remove 75.82 ft^2 of pine BA on 2.73 acres. The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 132.60 ft^2 of pine BA on 3.52 acres (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 4,517.83 ft^2 of pine BA on 110.54 acres of suitable habitat, 1,664.98 ft^2 of pine BA on 44.31 acres of potentially suitable habitat

and 343.44 ft^2 of pine BA on 26.13 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 15.15% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 6,526.25 ft^2 of pine BA on 180.98 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster A08-02a: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 9 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,895.42 ft^2 of pine BA on 81.50 acres of suitable habitat and 294.55 ft^2 of pine BA on 6.85 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,839.67 ft^2 of pine BA on 49.77 acres of potentially suitable habitat and 1,350.30 ft^2 of pine BA on 38.58 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2009 Infrastructure Support - Utilities (PN 67457) will remove 33.97 ft^2 of pine BA on 0.79 acres. The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 84.50 ft^2 of pine BA on 2.30 acres (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 2,832.42 ft^2 of pine BA on 79.70 acres of suitable habitat and 239.08 ft^2 of pine BA on 5.56 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,784.20 ft^2 of pine BA on 48.48 acres of potentially suitable habitat and 1,287.30 ft^2 of pine BA on 36.78 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition cannot meet the RS in the future (Table 6-15).

FB Cluster A08-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,009.39 ft^2 of pine BA on 97.79 acres of suitable habitat and 51.00 ft^2 of pine BA on 2.00 acres of future potential habitat. There was no potentially suitable habitat. There were 17.33 acres of forested habitat within the A20 Impact Area (Table 6-3).

The pre- project RS foraging habitat totals were 4,060.39 ft^2 of pine BA on 99.79 acres of future potential habitat. There was no suitable or potentially suitable habitat. There were 17.33 acres of forested habitat within the A20 Impact Area (Table 6-4).

The 2009 Anti-Armor Tracking and Live Fire Complex (PN 65078) will remove 5.74 acres of forested habitat within the A20 Impact Area (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 4,009.39 ft^2 of pine BA on 97.79 acres of suitable habitat and 51.00 ft^2 of pine BA on 2.00 acres of future potential habitat. There was no potentially suitable habitat. There were 11.59 acres of forested habitat within the A20 Impact Area (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,060.39 ft^2 of pine BA on 99.79 acres of future potential habitat. There was no suitable or potentially suitable habitat. There were 11.59 acres of forested habitat within the A20 Impact Area (Table 6-4). This partition cannot meet the RS in the future (Table 6-15).

FB Cluster A08-04: This cluster was inactive from 2004 to 2006 but had a PBG in 2007 and 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,111.51 ft^2 of pine BA on 27.11 acres of suitable habitat. There was no potentially suitable or future potential habitat. There were 154.79 acres of forested habitat within the A20 Impact Area (Table 6-3).

The pre- project RS foraging habitat totals were 1,111.51 ft^2 of pine BA on 27.11 acres of future potential habitat. There was no suitable or potentially suitable habitat. There were 154.79 acres of forested habitat within the A20 Impact Area (Table 6-4).

The 2009 Anti-Armor Tracking and Live Fire Complex (PN 65078) will remove 6.96 acres of forested habitat within the A20 Impact Area (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 1,111.51 ft^2 of pine BA on 27.11 acres of suitable habitat. There was no potentially suitable or future potential habitat. There were 147.83 acres of forested habitat within the A20 Impact Area (Table 6-3). Despite pre-project deficiencies, this cluster will not be taken at the cluster level because of forested acreage within the A20 Impact Area (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,111.51 ft^2 of pine BA on 27.11 acres of future potential habitat. There was no suitable or potentially suitable habitat. There were 147.83 acres of forested habitat within the A20 Impact Area (Table 6-4). This partition cannot meet the RS in the future (Table 6-15).

FB Cluster A09-03R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Good Hope MTA Range Access Road (PN 69358) will result in impacts within 50 feet of 1 cavity tree and 51 to 200 feet of a second cavity tree (Table 6-10).

The pre- project SMS foraging habitat totals were 419.17 ft^2 of pine BA on 11.89 acres of suitable habitat and 3,526.72 ft^2 of pine BA on 108.07 acres of potentially suitable habitat and 0.00 ft^2 of pine BA on 8.40 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,945.89 ft^2 of pine BA on 128.36 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-3).

The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 172.29 ft^2 of pine BA on 5.09 acres. The 2009 Good Hope Training Area Infrastructure (PN 69668) will remove 0.00 ft^2 of pine BA on 1.19 acre (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 393.87 ft^2 of pine BA on 11.20 acres of suitable habitat, 3,379.73 ft^2 of pine BA on 103.67 acres of potentially suitable habitat and

0.00 ft^2 of pine BA on 7.21 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 11.34% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,773.60 ft^2 of pine BA on 122.08 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-15).

FB Cluster A09-04R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,563.11 ft^2 of pine BA on 78.15 acres of suitable habitat, 130.85 ft^2 of pine BA on 4.29 acres of potentially suitable habitat and 2,680.81 ft^2 of pine BA on 121.29 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,374.77 ft^2 of pine BA on 203.73 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-4).

The 2009 Construction Buffer for Anti-Armor Tracking and Live Fire Complex (PN 65078) will remove 427.70 ft^2 of pine BA on 17.11 acres (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 2,563.11 ft^2 of pine BA on 78.15 acres of suitable habitat, 130.85 ft^2 of pine BA on 4.29 acres of potentially suitable habitat and 2,253.11 ft^2 of pine BA on 104.18 acres of future potential habitat (Table 6-3). Because minimization efforts were made, and no suitable or potentially suitable habitat was impacted, this cluster will not be taken at the cluster level despite pre-project deficiencies (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 67.18% of the SMS post-project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,947.07 ft^2 of pine BA on 186.62 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster A09-05: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,190.16 ft^2 of pine BA on 111.60 acres of suitable habitat, 405.51 ft^2 of pine BA on 13.35 acres of potentially suitable habitat and 1,206.58 ft^2 of pine BA on 50.12 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,802.25 ft^2 of pine BA on 175.07 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-4).

The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 150.10 ft^2 of pine BA on 4.18 acres (Table 6-6 and Figure 6-7).

The post- project SMS foraging habitat totals were 4,049.56 ft^2 of pine BA on 107.77 acres of suitable habitat, 401.01 ft^2 of pine BA on 13.20 acres of potentially suitable habitat and 1,201.58 ft^2 of pine BA on 49.92 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 44.88% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,652.15 ft^2 of pine BA on 170.89 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster A17-01: This cluster had a PBG in 2007 and 2008 and unknown status in 2006 (Table 6-5). It had been designated as a relic site removed from management prior to 2006. This cluster had 5 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 Multipurpose Machine Gun Range (MPMG2) (PN 65070) will remove all 5 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 4,545.01 ft^2 of pine BA on 85.96 acres of suitable habitat and 1,509.58 ft^2 of pine BA on 32.01 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 4,545.01 ft^2 of pine BA on 85.96 acres of potentially suitable habitat and 1,509.58 ft^2 of pine BA on 32.01 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2011 MPMG2 (PN 65070) will remove 200.41 ft^2 of pine BA on 3.24 acres. The MPMG2 construction limits will remove 4,767.06 ft^2 of pine BA on 93.97 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 41.08 ft^2 of pine BA on 0.79 acres of suitable habitat and 1,046.04 ft^2 of pine BA on 19.97 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat (Table 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 39.21% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 41.08 ft^2 of pine BA on 0.79 acres of potentially suitable habitat and 1,046.04 ft^2 of pine BA on 19.97 acres of future potential habitat. There was no suitable habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster A17-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 MPMG2 (PN 65070) and associated beaten area will remove all 6 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 3,298.06 ft^2 of pine BA on 62.70 acres of suitable habitat and 428.19 ft^2 of pine BA on 58.72 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,298.06 ft^2 of pine BA on 62.70 acres of potentially suitable habitat and 428.19 ft^2 of pine BA on 58.72 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2011 MPMG2 (PN 65070) will remove 1,412.21 ft^2 of pine BA on 44.86 acres. The MPMG2 construction limits will remove 2,083.33 ft^2 of pine BA on 70.22 acres (Table 6-8 and

Figure 6-7). The MPMG2 beaten area will remove 99.47 ft^2 of pine BA on 2.03 acres (Table 6-9 and Figure 6-7).

The post- project SMS foraging habitat totals were 110.74 ft^2 of pine BA on 2.26 acres of suitable habitat and 20.50 ft^2 of pine BA on 2.05 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 110.74 ft^2 of pine BA on 2.26 acres of potentially suitable habitat and 20.50 ft^2 of pine BA on 2.05 acres of future potential habitat. There was no suitable habitat (Table 6-4). This partition cannot meet RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster A17-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 MPMG2 (PN 65070) will remove all 10 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 4,660.04 ft^2 of pine BA on 88.10 acres of suitable habitat and 1,008.50 ft^2 of pine BA on 20.17 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,805.40 ft^2 of pine BA on 53.95 acres of potentially suitable habitat and 2,863.14 ft^2 of pine BA on 54.32 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2011 MPMG2 (PN 65070) will remove 56.68 ft^2 of pine BA on 1.09 acre. The MPMG2 construction limits will remove 3,658.75 ft^2 of pine BA on 70.63 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 1,543.61 ft^2 of pine BA on 28.36 acres of suitable habitat and 409.50 ft^2 of pine BA on 8.19 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3). This cluster will also be taken at the cluster level due

to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 45.39% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1.04 ft^2 of pine BA on 0.02 acres of potentially suitable habitat and 1,952.07 ft^2 of pine BA on 36.53 acres of future potential habitat. There was no suitable habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster A17-06: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 13 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 MPMG2 (PN 65070) and access road will remove all 13 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 4,321.54 ft^2 of pine BA on 96.66 acres of suitable habitat and 98.00 ft^2 of pine BA on 24.01 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,661.88 ft^2 of pine BA on 51.19 acres of potentially suitable habitat and 1,757.66 ft^2 of pine BA on 69.48 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2011 MPMG2 (PN 65070) will remove 874.85 ft^2 of pine BA on 18.21 acres. The MPMG2 construction limits will remove 3,048.68 ft^2 of pine BA on 69.42 acres. The MPMG2 access road will remove 137.60 ft^2 of pine BA on 3.76 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 263.49 ft^2 of pine BA on 5.41 acres of suitable habitat and 94.92 ft^2 of pine BA on 23.87 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The pre- project RS foraging habitat totals were 221.52 ft^2 of pine BA on 4.26 acres of potentially suitable habitat and 136.89 ft^2 of pine BA on 25.02 acres of future potential habitat.

There was no suitable habitat (Table 6-4). This partition cannot meet RS in the future (Table 6-14).

FB Cluster A17-08: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 MPMG2 (PN 65070) will remove all 5 cavity trees, which will result in "take" of the cluster by loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 7,119.92 ft^2 of pine BA on 111.84 acres of suitable habitat and 106.10 ft^2 of pine BA on 18.73 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 7,119.92 ft^2 of pine BA on 111.84 acres of potentially suitable habitat and 106.10 ft^2 of pine BA on 18.73 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2011 MPMG2 (PN 65070) will remove 6,426.31 ft^2 of pine BA on 114.87 acres. The MPMG2 construction limits will remove 799.71 ft^2 of pine BA on 15.70 acres (Table 6-8 and Figure 6-7).

There was no suitable, potentially suitable or future potential SMS foraging habitat post-project (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

There was no suitable, potentially suitable, or future potential RS foraging habitat post-project (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

FB Cluster A17-11R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 MPMG2 (PN 65070) will remove all 10 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 8,139.12 ft^2 of pine BA on 123.32 acres of suitable habitat and 1.93 ft^2 of pine BA on 0.35 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 8,139.12 ft^2 of pine BA on 123.32 acres of potentially suitable habitat and 1.93 ft^2 of pine BA on 0.35 acre of future potential habitat (Table 6-4). There was no suitable habitat.

The 2011 MPMG2 (PN 65070) will remove 1,306.14 ft^2 of pine BA on 19.79 acres. The MPMG2 construction limits will remove 5,726.77 ft^2 of pine BA on 87.09 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 1,108.14 ft^2 of pine BA on 16.79 acres of suitable habitat (Table 6-3). There was no potentially suitable or future potential habitat. This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,108.14 ft^2 of pine BA on 16.79 acres of potentially suitable habitat (Table 6-4). There was no suitable or future potential habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster A17-12R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 977.46 ft^2 of pine BA on 14.81 acres of suitable habitat, 1,593.96 ft^2 of pine BA on 43.67 acres of potentially suitable habitat and 1,486.81 ft^2 of pine BA on 62.53 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 977.46 ft^2 of pine BA on 14.81 acres of potentially suitable habitat and 3,080.77 ft^2 of pine BA on 106.20 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2011 MPMG2 (PN 65070) construction limits will remove 998.03 ft^2 of pine BA on 31.22 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 663.96 ft^2 of pine BA on 10.06 acres of suitable habitat, 1,593.96 ft^2 of pine BA on 43.67 acres of potentially suitable habitat and 802.28 ft^2 of pine BA on 36.06 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies

(Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 663.96 ft^2 of pine BA on 10.06 acres of potentially suitable habitat and 2,396.24 ft^2 of pine BA on 79.73 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster A17-13: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). Construction of the 2011 MPMG2 (PN 65070) will remove all 10 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 4,178.72 ft^2 of pine BA on 80.36 acres of suitable habitat and 1,221.00 ft^2 of pine BA on 24.42 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 4,178.72 ft^2 of pine BA on 80.36 acres of potentially suitable habitat and 1,221.00 ft^2 of pine BA on 24.42 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2011 MPMG2 (PN 65070) will remove 269.36 ft^2 of pine BA on 5.18 acres. The MPMG2 construction limits will remove 3,236.04 ft^2 of pine BA on 62.57 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 1,113.32 ft^2 of pine BA on 21.41 acres of suitable habitat and 781.00 ft^2 of pine BA on 15.62 acres of potentially suitable habitat. There was no future potential habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 27.14% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,113.32 ft^2 of pine BA on 21.41 acres of potentially suitable habitat and 781.00 ft^2 of pine BA on 15.62 acres of future potential habitat. There was no suitable habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

FB Cluster A17-14a: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,542.07 ft^2 of pine BA on 66.47 acres of suitable habitat, 1,130.39 ft^2 of pine BA on 20.18 acres of potentially suitable habitat and 95.52 ft^2 of pine BA on 15.92 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 229.32 ft^2 of pine BA on 4.41 acres of potentially suitable habitat and 4,538.66 ft^2 of pine BA on 98.16 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The MPMG2 (PN 65070) construction limits will remove 137.28 ft^2 of pine BA on 2.64 acres (Table 6-8 and Figure 6-7).

The post- project SMS foraging habitat totals were 3,404.79 ft^2 of pine BA on 63.83 acres of suitable habitat, 1,130.39 ft^2 of pine BA on 20.18 acres of potentially suitable habitat and 95.52 ft^2 of pine BA on 15.92 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-15). Loblolly pine that is at high risk of decline accounts for 61.31% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 92.04 ft^2 of pine BA on 1.77 acres of potentially suitable habitat and 4,538.66 ft^2 of pine BA on 98.16 acres of future potential habitat. There was no suitable habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-15).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster A20-04: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,059.61 ft^2 of pine BA on 20.97 acres of suitable habitat, 3,424.07 ft^2 of pine BA on 74.16 acres of potentially suitable habitat and 1,545.99 ft^2 of pine BA on 62.22 acres of future potential habitat. There were 155.36 acres of forested habitat within the A20 Impact Area (Table 6-3).

The pre- project RS foraging habitat totals were 272.64 ft^2 of pine BA on 4.26 acres of potentially suitable habitat and 5,757.03 ft^2 of pine BA on 153.09 acres of future potential habitat. There were 155.36 acres of forested habitat within the A20 Impact Area. There was no suitable habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 370.52 ft^2 of pine BA on 8.38 acres (Table 6-7 and Figure 6-5)

The post- project SMS foraging habitat totals were 933.28 ft^2 of pine BA on 18.47 acres of suitable habitat, 3,229.54 ft^2 of pine BA on 70.19 acres of potentially suitable habitat and 1,496.33 ft^2 of pine BA on 60.31 acres of future potential habitat. There were 155.36 acres of forested habitat within the A20 Impact Area (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 15.03% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 272.64 ft^2 of pine BA on 4.26 acres of potentially suitable habitat and 5,386.51 ft^2 of pine BA on 144.71 acres of future potential habitat. There were 155.36 acres of forested habitat within the A20 Impact Area. There was no suitable habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-11).

FB Cluster A20-06: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,441.49 ft^2 of pine BA on 121.55 acres of suitable habitat and 1,402.06 ft^2 of pine BA on 50.97 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 5,843.55 ft^2 of pine BA on 172.52 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 134.67 ft^2 of pine BA on 4.04 acres (Table 6-7 and Figure 6-5)

The post- project SMS foraging habitat totals were 4,306.82 ft^2 of pine BA on 117.97 acres of suitable habitat and 1,402.06 ft^2 of pine BA on 50.51 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 19.11% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,708.88 ft^2 of pine BA on 168.48 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster BB03-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 872.37 ft^2 of pine BA on 23.48 acres of suitable habitat, 326.60 ft^2 of pine BA on 6.55 acres of potentially suitable habitat and 1,786.60 ft^2 of pine BA on 100.60 acres of future potential habitat (Table 6-3).

The pre- project RS habitat foraging totals were 424.04 ft^2 of pine BA on 8.78 acres of potentially suitable habitat and 4,004.10 ft^2 of pine BA on 166.76 acres of future potential habitat. There was no suitable habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 232.35 ft^2 of pine BA on 9.46 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 849.05 ft^2 of pine BA on 22.93 acres of suitable habitat, 304.20 ft^2 of pine BA on 6.07 acres of potentially suitable habitat and 1,599.97 ft^2 of pine BA on 92.17 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 12.07% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 386.60 ft^2 of pine BA on 7.99 acres of potentially suitable habitat and 3,809.19 ft^2 of pine BA on 158.09 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition may meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster BB04-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,134.91 ft^2 of pine BA on 102.51 acres of suitable habitat, 291.37 ft^2 of pine BA on 4.02 acres of potentially suitable habitat and 809.54 ft^2 of pine BA on 37.28 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 461.13 ft^2 of pine BA on 10.85 acres of suitable habitat, 1,036.17 ft^2 of pine BA on 23.22 acres of potentially suitable habitat and 3,738.52 ft^2 of pine BA on 109.74 acres of future potential habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 414.19 ft^2 of pine BA on 11.51 acres (Table 6-7 and Figure 6-5). As a result of project impacts, 337.64 ft^2 of pine BA on 7.34 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 3,454.94 ft^2 of pine BA on 87.69 acres of suitable habitat, 291.37 ft^2 of pine BA on 4.02 acres of potentially suitable habitat and 737.68 ft^2 of pine BA on 33.25 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 27.57% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 461.13 ft^2 of pine BA on 10.85 acres of suitable habitat, 1,025.50 ft^2 of pine BA on 22.95 acres of potentially suitable habitat and 2,997.36 ft^2 of pine BA on 91.16 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster BB05-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,424.61 ft^2 of pine BA on 87.25 acres of suitable habitat, 3,976.85 ft^2 of pine BA on 101.41 acres of potentially suitable habitat and 1,308.38 ft^2 of pine BA on 55.34 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 8,709.84 ft^2 of pine BA on 244.00 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 616.01 ft^2 of pine BA on 13.74 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 2,844.09 ft^2 of pine BA on 74.63 acres of suitable habitat, 3,952.36 ft^2 of pine BA on 100.82 acres of potentially suitable habitat and 1,297.38 ft^2 of pine BA on 54.81 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 25.24% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 8,093.83 ft^2 of pine BA on 230.26 of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster C01-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 12 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Area Training Roads (Phase I) (PN 65557) will have impacts within 51 to 200 feet of 1 cavity tree (Table 6-10).

The pre- project SMS foraging habitat totals were 982.80 ft^2 of pine BA on 18.97 acres of suitable habitat, 2,841.78 ft^2 of pine BA on 71.81 acres of potentially suitable habitat and 676.98 ft^2 of pine BA on 41.32 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 704.55 ft^2 of pine BA on 11.55 acres of suitable habitat, 1,557.11 ft^2 of pine BA on 35.46 acres of potentially suitable habitat and 2,239.90 ft^2 of pine BA on 85.09 acres of future potential habitat (Table 6-4).

The 2009 Infrastructure Support - Utilities (PN 67457) will remove 139.74 ft^2 of pine BA on 3.04 acres (Table 6-6 and Figure 6-5). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 184.65 ft^2 of pine BA on 5.39 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 912.65 ft^2 of pine BA on 17.82 acres of suitable habitat, 2,680.68 ft^2 of pine BA on 68.00 acres of potentially suitable habitat and 583.84 ft^2 of pine BA on 37.85 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 20.85% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 634.40 ft^2 of pine BA on 10.40 acres of suitable habitat, 1,424.13 ft^2 of pine BA on 32.43 acres of potentially suitable habitat and 2,118.64 ft^2 of pine BA on 80.84 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster C01-06: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,212.32 ft^2 of pine BA on 27.04 acres of suitable habitat, 3,105.49 ft^2 of pine BA on 75.53 acres of potentially suitable habitat and 75.90 ft^2 of pine BA on 19.38 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,212.32 ft^2 of pine BA on 27.04 acres of suitable habitat, 2,024.01 ft^2 of pine BA on 47.07 acres of potentially suitable habitat and 1,157.38 ft^2 of pine BA on 47.84 acres of future potential habitat (Table 6-4).

The 2009 Infrastructure Support - Utilities (PN 67457) will remove 147.84 ft^2 of pine BA on 3.53 acres (Table 6-6 and Figure 6-5). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 265.93 ft^2 of pine BA on 6.98 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 1,212.32 ft^2 of pine BA on 27.04 acres of suitable habitat, 2,722.22 ft^2 of pine BA on 66.09 acres of potentially suitable habitat and 45.40 ft^2 of pine BA on 18.31 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 37.20% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,212.32 ft^2 of pine BA on 27.04 acres of suitable habitat, 1,812.88 ft^2 of pine BA on 42.16 acres of potentially suitable habitat and

954.74 ft^2 of pine BA on 42.24 acres of future potential habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-15).

FB Cluster D05-02R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,943.82 ft^2 of pine BA on 125.55 acres of suitable habitat and 853.42 ft^2 of pine BA on 38.87 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 5,797.24 ft^2 of pine BA on 164.42 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 2,118.25 ft^2 of pine BA on 61.38 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 3,416.93 ft^2 of pine BA on 91.05 acres of suitable habitat and 262.06 ft^2 of pine BA on 11.99 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 8.16% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,678.99 ft^2 of pine BA on 103.04 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-15).

FB Cluster D05-04R: This cluster had a PBG from 2005 to 2008 (Table 6-5) and contained 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 9,780.13 ft^2 of pine BA on 243.87 acres of suitable habitat and 502.91 ft^2 of pine BA on 46.85 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3).

The pre- project RS foraging habitat totals were 10,283.04 ft^2 of pine BA on 290.72 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-4).

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 4,527.36 ft^2 of pine BA on 127.55 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 385.48 ft^2 of pine BA on 9.59 acres (Table 6-6 and Figure 6-10). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 496.79 ft^2 of pine BA on 13.49 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 4,747.26 ft^2 of pine BA on 122.15 acres of suitable habitat and 126.15 ft^2 of pine BA on 17.94 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 49.81% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS habitat totals were 4,873.41 ft^2 of pine BA on 140.09 acres of future potential habitat. There was no suitable or potentially suitable habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

FB Cluster D06-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,955.13 ft^2 of pine BA on 63.12 acres of suitable habitat and 1,490.97 ft^2 of pine BA on 92.27 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 3,446.10 ft^2 of pine BA on 155.39 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 399.61 ft^2 of pine BA on 30.17 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 93.63 ft^2 of pine BA on 9.25 acres (Table 6-6 and Figure 6-10). As a result of project impacts, 135.64 ft^2 of pine BA on 13.94 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 1,954.18 ft^2 of pine BA on 63.09 acres of suitable habitat and 863.04 ft^2 of pine BA on 38.94 acres of future potential habitat (Table 6-

3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 12.63% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,817.22 ft^2 of pine BA on 102.03 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet RS in the future (Table 6-14).

FB Cluster D08-01R: This cluster had a PBG in 2004, 2007 and 2008; there was a solitary male in 2005 and 2006 (Table 6-5). There were 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,154.70 ft^2 of pine BA on 86.01 acres of suitable habitat and 1,317.27 ft^2 of pine BA on 131.25 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 5,355.42 ft^2 of pine BA on 242.89 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

Under the SMS, the 2009 Southern Training Area Infrastructure (PN 69743) will remove 2,618.92 ft^2 of pine BA on 83.72 acres. The 2009 Southern Training Area Infrastructure - Upgrade Tank Trails (PN 69743) will remove 52.73 ft^2 of pine BA on 2.22 acres (Table 6-6 and Figure 6-10).

Under the RSG, the 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 3,327.72 ft^2 of pine BA on 104.22 acres. The 2009 Southern Training Area Infrastructure - Upgrade Tank Trails (PN 69743) will remove 227.05 ft^2 of pine BA on 7.34 acres (Table 6-4 and Figure 6-10).

The post- project SMS foraging habitat totals were 1,229.88 ft^2 of pine BA on 39.61 acres of suitable habitat and 570.44 ft^2 of pine BA on 91.71 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 54.76% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,800.65 ft^2 of pine BA on 131.33 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition may meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster D10-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Southern Training Area Infrastructure and Upgraded Tank Trails (PN 69743) will impact 2 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 1,605.05 ft^2 of pine BA on 48.18 acres of suitable habitat and 929.93 ft^2 of pine BA on 105.75 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,333.53 ft^2 of pine BA on 40.41 acres of suitable habitat and 1,891.77 ft^2 of pine BA on 132.84 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

Under the SMS, the 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 29.05 ft^2 of pine BA on 8.59 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 132.04 ft^2 of pine BA on 9.30 acres (Table 6-6 and Figure 6-10). As a result of project impacts, 115.13 ft^2 of pine BA on 4.97 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

Under the RSG, the 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 445.63 ft^2 of pine BA on 20.19 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 312.24 ft^2 of pine BA on 14.11 acres (Table 6-4 and Figure 6-10). As a result of project impacts, 127.45 ft^2 of pine BA on 5.26 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-4).

The post- project SMS foraging habitat totals were 1,517.30 ft^2 of pine BA on 45.68 acres of suitable habitat and 741.46 ft^2 of pine BA on 85.39 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to

loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 48.82% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,274.13 ft^2 of pine BA on 38.61 acres of suitable habitat and 1,065.85 ft^2 of pine BA on 95.08 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition may meet RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster D11-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Southern Training Area Infrastructure and Upgraded Tank Trails (PN 69743) will impact all 8 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 3,502.41 ft^2 of pine BA on 94.01 acres of suitable habitat and 104.47 ft^2 of pine BA on 49.69 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 3,174.20 ft^2 of pine BA on 83.36 acres of suitable habitat and 432.68 ft^2 of pine BA on 60.34 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 1,795.76 ft^2 of pine BA on 78.96 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 152.47 ft^2 of pine BA on 5.53 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 1,651.38 ft^2 of pine BA on 44.15 acres of suitable habitat and 7.27 ft^2 of pine BA on 15.05 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,441.21 ft^2 of pine BA on 37.37 acres of suitable habitat and 217.44 ft^2 of pine BA on 21.84 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data). In addition, this cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster D11-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Southern Training Area Infrastructure (PN 69743) will remove all 7 cavity trees which will result in "take" of the cluster by loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 3,871.19 ft^2 of pine BA on 104.88 acres of suitable habitat and 1,277.31 ft^2 of pine BA on 54.91 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,762.51 ft^2 of pine BA on 45.69 acres of suitable habitat and 3,385.99 ft^2 of pine BA on 114.10 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 4,032.61 ft^2 of pine BA on 125.66 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 429.55 ft^2 of pine BA on 13.79 acres (Table 6-6 and Figure 6-10). As a result of project impacts, 572.20 ft^2 of pine BA on 15.94 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 5.77 ft^2 of pine BA on 0.15 acre of suitable habitat and 108.37 ft^2 of pine BA on 4.25 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5.77 ft^2 of pine BA on 0.15 acre of suitable habitat and 108.37 ft^2 of pine BA on 4.25 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data). In addition, this cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster D12-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 9 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Southern Training Area Infrastructure and Upgraded Tank Trails (PN 69743) will impact 1 cavity tree within 50 feet and 2 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 4,975.59 ft^2 of pine BA on 106.88 acres of suitable habitat and 2,011.29 ft^2 of pine BA on 111.76 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 2,761.74 ft^2 of pine BA on 58.36 acres of suitable habitat and 4,225.14 ft^2 of pine BA on 160.28 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 210.13 ft^2 of pine BA on 6.74 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 602.11 ft^2 of pine BA on 20.19 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 4,363.64 ft^2 of pine BA on 93.01 acres of suitable habitat and 1,811.00 ft^2 of pine BA on 98.70 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 3.13% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,535.49 ft^2 of pine BA on 53.88 acres of suitable habitat and 3,639.15 ft^2 of pine BA on 137.83 acres of future potential habitat (Table

6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster D16-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,494.10 ft^2 of pine BA on 38.63 acres of suitable habitat, 620.09 ft^2 of pine BA on 18.51 acres of potentially suitable habitat and 2,506.48 ft^2 of pine BA on 167.49 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 838.00 ft^2 of pine BA on 16.76 acres of suitable habitat and 3,782.67 ft^2 of pine BA on 207.87 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 916.97 ft^2 of pine BA on 47.90 acres (Table 6-7 and Figure 6-10).

The post- project SMS foraging habitat totals were 1,494.10 ft^2 of pine BA on 38.63 acres of suitable habitat, 0.34 ft^2 of pine BA on 0.01 acre of potentially suitable habitat and 2,209.26 ft^2 of pine BA on 138.09 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 838.00 ft^2 of pine BA on 16.76 acres of suitable habitat and 2,865.70 ft^2 of pine BA on 159.97 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster D16-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Southern Training Area Infrastructure (PN 69743) will impact 1 cavity tree within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 575.61 ft^2 of pine BA on 16.55 acres of suitable habitat and 3,423.84 ft^2 of pine BA on 209.69 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 3,999.45 ft^2 of pine BA on 226.24 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 2,374.25 ft^2 of pine BA on 138.45 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 773.78 ft^2 of pine BA on 36.92 acres. The 2009 Southern Training Area Infrastructure - Urban Training Site (PN 69743) will remove 4.92 ft^2 of pine BA on 0.24 acre (Table 6-6 and Figure 6-10). As a result of project impacts, 497.47 ft^2 of pine BA on 24.03 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 349.03 ft^2 of pine BA on 26.60 acres of future potential habitat (Table 6-3). There was no suitable or potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 349.03 ft^2 of pine BA on 26.60 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster D17-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be taken or impacted by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,844.96 ft^2 of pine BA on 134.03 acres of suitable habitat, 320.86 ft^2 of pine BA on 10.52 acres of potentially suitable habitat and 1,655.40 ft^2 of pine BA on 160.44 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,500.32 ft^2 of pine BA on 34.49 acres of suitable habitat and 5,320.90 ft^2 of pine BA on 270.50 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure Urban Training Site (PN 69743) will remove 161.17 ft^2 of pine BA on 6.74 acres. The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 2,196.00 ft^2 of pine BA on 71.34 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 522.61 ft^2 of pine BA on 16.19 acres (Table 6-6 and Figure 6-10). As a result of project impacts, 578.42 ft^2 of pine BA on 24.28 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 2,580.79 ft^2 of pine BA on 74.30 acres of suitable habitat, 320.86 ft^2 of pine BA on 10.52 acres of potentially suitable habitat and 461.37 ft^2 of pine BA on 101.62 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 83.53% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 609.00 ft^2 of pine BA on 14.00 acres of suitable habitat and 2,754.02 ft^2 of pine BA on 172.44 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster D17-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,242.34 ft^2 of pine BA on 114.09 acres of suitable habitat and 1,782.06 ft^2 of pine BA on 89.62 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 598.00 ft^2 of pine BA on 13.00 acres of suitable habitat and 5,426.40 ft^2 of pine BA on 190.71 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 2,959.41 ft^2 of pine BA on 99.69 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 409.51 ft^2 of pine BA on 15.02 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 1,920.96 ft^2 of pine BA on 51.79 acres of suitable habitat and 734.52 ft^2 of pine BA on 37.21 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 27.71% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 8.74 ft^2 of pine BA on 0.19 acre of suitable habitat and 2,646.74 ft^2 of pine BA on 88.81 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster D17-04R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Southern Training Area Infrastructure (PN 69743) will impact 4 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 3,545.37 ft^2 of pine BA on 90.79 acres of suitable habitat and 1,865.55 ft^2 of pine BA on 101.80 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,485.25 ft^2 of pine BA on 34.55 acres of suitable habitat and 3,925.67 ft^2 of pine BA on 158.04 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 2,347.45 ft^2 of pine BA on 79.71 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 557.94 ft^2 of pine BA on 17.97 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 1,927.51 ft^2 of pine BA on 47.56 acres of suitable habitat and 578.02 ft^2 of pine BA on 47.35 acres of future potential habitat (Table 6-

3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,060.93 ft^2 of pine BA on 24.93 acres of suitable habitat and 1,444.60 ft^2 of pine BA on 69.98 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster E02-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,821.35 ft^2 of pine BA on 89.39 acres of suitable habitat, 576.34 ft^2 of pine BA on 19.07 acres of potentially suitable habitat and 395.65 ft^2 of pine BA on 73.24 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 44.62 ft^2 of pine BA on 0.92 acre of suitable habitat and 3,748.72 ft^2 of pine BA on 180.78 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 71.41 ft^2 of pine BA on 2.93 acres (Table 6-7 and Figure 6-10).

The post- project SMS foraging habitat totals were 2,781.98 ft^2 of pine BA on 88.12 acres of suitable habitat, 554.11 ft^2 of pine BA on 18.38 acres of potentially suitable habitat and 385.84 ft^2 of pine BA on 72.27 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 6.54% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 44.62 ft^2 of pine BA on 0.92 acre of suitable habitat and 3,677.31 ft^2 of pine BA on 177.85 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster E04-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). Upgraded tank trails within the Southern Training Area Infrastructure (PN 69743) will impact 3 cavity trees within 51 to 200 feet, 2 within 50 feet and remove 3 inactive cavity trees. The Southern Training Area Infrastructure - Maneuver Area (PN 69743) will impact 1 cavity tree within 51 to 200 feet and 2 cavity trees within 50 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 4,509.48 ft^2 of pine BA on 115.00 acres of suitable habitat and 1,259.72 ft^2 of pine BA on 52.36 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 406.95 ft^2 of pine BA on 9.65 acres of suitable habitat, 575.70 ft^2 of pine BA on 6.06 acres of potentially suitable habitat and 4,786.55 ft^2 of pine BA on 151.65 acres of future potential habitat (Table 6-4).

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 1,577.90 ft^2 of pine BA on 44.07 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 725.67 ft^2 of pine BA on 15.73 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 2,555.76 ft^2 of pine BA on 65.73 acres of suitable habitat and 909.87 ft^2 of pine BA on 41.83 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 24.13% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 245.25 ft^2 of pine BA on 5.45 acres of suitable habitat, 282.15 ft^2 of pine BA on 2.97 acres of potentially suitable habitat and 2,867.01 ft^2 of pine BA on 99.14 acres of future potential habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster F02-01R: This cluster was inactive in 2004, had a solitary male in 2005 and a PBG from 2006 to 2008 (Table 6-5). It had 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,336.44 ft^2 of pine BA on 53.68 acres of suitable habitat and 2,646.83 ft^2 of pine BA on 136.76 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 2,130.20 ft^2 of pine BA on 48.58 acres of suitable habitat and 2,853.07 ft^2 of pine BA on 141.86 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 2,784.30 ft^2 of pine BA on 103.00 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 460.56 ft^2 of pine BA on 15.78 acres (Table 6-6 and Figure 6-10). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 369.57 ft^2 of pine BA on 10.90 acres (Table 6-7 and Figure 6-10).

The post- project SMS foraging habitat totals were 528.06 ft^2 of pine BA on 11.82 acres of suitable habitat and 840.78 ft^2 of pine BA on 48.94 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 7.36% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 528.06 ft^2 of pine BA on 11.82 acres of suitable habitat and 840.78 ft^2 of pine BA on 48.94 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster HCC-08R: This cluster was inactive in 2004, had a solitary male from 2005 to 2007 and had a PBG in 2008 (Table 6-5). It contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,556.16 ft^2 of pine BA on 46.77 acres of suitable habitat, 1,573.41 ft^2 of pine BA on 50.04 acres of potentially suitable habitat and 2,398.11 ft^2 of pine BA on 92.09 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 117.82 ft^2 of pine BA on 2.74 acres of potentially suitable habitat and 5,409.86 ft^2 of pine BA on 186.16 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 Infrastructure Support - Utilities (PN 67457) will remove 26.23 ft^2 of pine BA on 0.61 acre (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 1,529.93 ft^2 of pine BA on 46.16 acres of suitable habitat, 1,573.41 ft^2 of pine BA on 50.04 acres of potentially suitable habitat and 2,398.11 ft^2 of pine BA on 92.09 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 21.90% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 91.59 ft^2 of pine BA on 2.13 acres of suitable habitat and 5,409.86 ft^2 of pine BA on 186.16 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster HCC-10R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Good Hope Range Access Road (PN 69358) will impact 2 cavity trees within 50 feet, 5 trees within 51 to 200 feet and will remove 1 active cavity tree and 1 active start (Table 6-10). These impacts and removals will likely result in "take" of the cluster by harassment (Table 6-12).

The pre- project SMS foraging habitat totals were 4,302.80 ft^2 of pine BA on 122.28 acres of suitable habitat, 457.11 ft^2 of pine BA on 11.74 acres of potentially suitable habitat and 204.00 ft^2 of pine BA on 11.07 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 347.01 ft^2 of pine BA on 8.07 acres of potentially suitable habitat and 4,616.90 ft^2 of pine BA on 137.02 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 Infrastructure Support - Utilities (PN 67457) will remove 87.90 ft^2 of pine BA on 2.78 acres. The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 493.44 ft^2 of pine BA on 13.64 acres (Table 6-6 and Figure 6-5). The 2010 Existing Training Area Road Repairs Project (PN 65557) will remove 55.29 ft^2 of pine BA on 1.59 acres (Table 6-7 and Figure 6-5). The 2012 Harmony Church Recreation Center (PN 65246) will remove 33.60 ft^2 of pine BA on 1.12 acres (Table 6-9 and Figure 6-5). As a result of project impacts, 75.09 ft^2 of pine BA on 2.03 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 3,619.92 ft^2 of pine BA on 103.11 acres of suitable habitat, 398.57 ft^2 of pine BA on 10.04 acres of potentially suitable habitat and 200.10 ft^2 of pine BA on 10.78 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 24.06% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 322.07 ft^2 of pine BA on 7.49 acres of potentially suitable habitat and 3,896.52 ft^2 of pine BA on 116.44 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition may meet the RS in the future (Table 6-15).

FB Cluster HCC-11R: This cluster was captured by A07-01 in 2004, but had a PBG from 2005 to 2008 (Table 6-5). It had 8 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will have impacts within 51 to 200 feet of 1 cavity tree (Table 6-10).

The pre- project SMS foraging habitat totals were 385.31 ft^2 of pine BA on 11.73 acres of suitable habitat, 56.00 ft^2 of pine BA on 1.05 acres of potentially suitable habitat and 4,659.29 ft^2 of pine BA on 196.06 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 68.73 ft^2 of pine BA on 1.74 acres of potentially suitable habitat and 5,031.87 ft^2 of pine BA on 207.10 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2010 Existing Training Area Road Repairs Project (PN 65557) will remove 370.62 ft^2 of pine BA on 14.09 acres (Table 6-7 and Figure 6-5). As a result of project impacts, 47.11 ft^2 of pine BA on 1.23 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 301.46 ft^2 of pine BA on 9.57 acres of suitable habitat, 56.00 ft^2 of pine BA on 1.05 acres of potentially suitable habitat, and 4,325.41 ft^2 of pine BA on 182.90 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-2, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 9.60% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,682.87 ft^2 of pine BA on 193.52 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster J01-02R: This cluster had a solitary male in 2004 and a PBG from 2005 to 2008 (Table 6-5). There were 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,215.31 ft^2 of pine BA on 50.92 acres of suitable habitat and 1,213.96 ft^2 of pine BA on 147.86 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 470.25 ft^2 of pine BA on 10.45 acres of suitable habitat, 289.60 ft^2 of pine BA on 3.62 acres of potentially suitable habitat and 2,669.42 ft^2 of pine BA on 184.71 acres of future potential habitat (Table 6-4).

The 2009 Construction of Paved Training Area Roads Project (PN 65554) will remove 229.97 ft^2 of pine BA on 6.36 acres (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 1,985.34 ft^2 of pine BA on 48.04 acres of suitable habitat and 1,213.96 ft^2 of pine BA on 144.38 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 0.71% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 470.25 ft^2 of pine BA on 10.45 acres of suitable habitat, 289.23 ft^2 of pine BA on 3.61 acres of potentially suitable habitat and 2,439.82 ft^2 of pine BA on 178.36 acres of future potential habitat (Table 6-4). This partition can meet the RS in the future (Table 6-14).

FB Cluster J02-02R: This cluster had a PBG from 2004 to 2008 (Table 6-5). It had 9 cavity trees in various stages of completion and suitability (Appendix G). The Construction of Paved Training Area Roads (PN 65554) will impact 3 cavity trees within 50 feet and remove 5 cavity trees, which will result in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 459.43 ft^2 of pine BA on 10.81 acres of suitable habitat, 271.13 ft^2 of pine BA on 7.23 acres of potentially suitable habitat and 2,792.57 ft^2 of pine BA on 122.52 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 459.43 ft^2 of pine BA on 10.81 acres of suitable habitat and 3,063.70 ft^2 of pine BA on 129.75 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Construct Paved Training Area Roads - OSUT Maneuver Corridor (PN 65554) will remove 500.35 ft^2 of pine BA on 16.37 acres (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 260.10 ft^2 of pine BA on 6.12 acres of suitable habitat, 271.13 ft^2 of pine BA on 7.23 acres of potentially suitable habitat and 2,491.55 ft^2 of pine BA on 110.84 acres of future potential habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 260.10 ft^2 of pine BA on 6.12 acres of suitable habitat and 2,762.68 ft^2 of pine BA on 118.07 acres of future potential habitat (Table 6-

4). There was no potentially suitable habitat. This partition may meet the RS in the future (Table 6-14).

FB Cluster J06-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 7,751.93 ft^2 of pine BA on 215.01 acres of suitable habitat, 4.04 ft^2 of pine BA on 0.13 acre of potentially suitable habitat and 2,012.96 ft^2 of pine BA on 73.30 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 53.63 ft^2 of pine BA on 1.43 acre of suitable habitat and 9,715.30 ft^2 of pine BA on 287.01 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Construction of Paved Training Area Roads Project (PN 65554) will remove 400.97 ft^2 of pine BA on 10.18 acres. The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 786.58 ft^2 of pine BA on 21.68 acres. The 2009 Southern Training Area Infrastructure - Upgrade Paved Roads and Tank Trails (PN 69743) will remove 441.25 ft^2 of pine BA on 12.43 acres (Table 6-6 and Figure 6-10).

The post- project SMS foraging habitat totals were 6,338.48 ft^2 of pine BA on 178.02 acres of suitable habitat, 4.04 ft^2 of pine BA on 0.13 acre of potentially suitable habitat and 1,797.61 ft^2 of pine BA on 66.00 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 2.44% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 36.38 ft^2 of pine BA on 0.97 acres of suitable habitat and 8,103.75 ft^2 of pine BA on 243.18 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster K02-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 6 cavity trees in various stages of completion and suitability (Appendix G). The Stationary Tank Range

(ST2) (65383) will remove all 6 cavity trees, resulting in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 330.41 ft^2 of pine BA on 10.65 acres of potentially suitable habitat and 5,602.37 ft^2 of pine BA on 245.71 acres of future potential habitat (Table 6-3). There was no suitable habitat.

The pre- project RS foraging habitat totals were 5,932.78 ft^2 of pine BA on 256.36 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 ST2 (PN 65383) will remove 2,894.42 ft^2 of pine BA on 123.79 acres. The ST2 construction limits will remove 899.31 ft^2 of pine BA on 39.60 acres (Table 6-6 and Figure 6-6). The 2011 ST2 beaten area will remove 139.91 ft^2 of pine BA on 7.74 acres (Table 6-8 and Figure 6-6). As a result of project impacts, 356.70 ft^2 of pine BA on 12.69 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 1.26 ft^2 of pine BA on 0.04 acre of potentially suitable habitat and 1,641.18 ft^2 of pine BA on 72.50 acres of future potential habitat (Table 6-3). There was no suitable habitat. This cluster will also be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 100.00% of the SMS post-project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,642.44 ft^2 of pine BA on 72.54 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster K08-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 5 cavity trees in various stages of completion and suitability (Appendix G). The Construction of Paved Training Area Roads (PN 65554) will impact 1 cavity tree within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 3,561.55 ft^2 of pine BA on 97.98 acres of suitable habitat and 0 ft^2 of pine BA on 28.93 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,603.10 ft^2 of pine BA on 37.72 acres of suitable habitat and 1,958.45 ft^2 of pine BA on 89.19 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Construct Paved Training Area Roads Project (PN 65554) will remove 434.05 ft^2 of pine BA on 12.50 acres (Table 6-6 and Figure 6-9).

The post- project SMS foraging habitat totals were 3,127.50 ft^2 of pine BA on 85.48 acres of suitable habitat and 0.00 ft^2 of pine BA on 28.93 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 30.83% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,484.95 ft^2 of pine BA on 34.94 acres of suitable habitat and 1,642.55 ft^2 of pine BA on 79.47 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-15).

FB Cluster K08-04: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 6,661.97 ft^2 of pine BA on 180.60 acres of suitable habitat and 129.66 ft^2 of pine BA on 11.79 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 983.45 ft^2 of pine BA on 23.14 acres of suitable habitat, 207.48 ft^2 of pine BA on 5.46 acres of potentially suitable habitat and 5,600.70 ft^2 of pine BA on 163.79 acres of future potential habitat (Table 6-4).

The 2009 Construct Paved Training Area Roads Project (PN 65554) will remove 565.75 ft^2 of pine BA on 15.14 acres (Table 6-6 and Figure 3-8). As a result of project impacts, 1,086.30 ft^2 of pine BA on 37.59 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 5,139.58 ft^2 of pine BA on 136.31 acres of suitable habitat and 0.00 ft^2 of pine BA on 3.35 acres of future potential habitat (Table 6-

3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 3-13). Loblolly pine that is at high risk of decline accounts for 25.30% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 878.05 ft^2 of pine BA on 20.66 acres of suitable habitat, 112.10 ft^2 of pine BA on 2.95 acres of potentially suitable habitat and 4,149.43 ft^2 of pine BA on 116.05 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster K09-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,810.40 ft^2 of pine BA on 89.84 acres of suitable habitat, 22.00 ft^2 of pine BA on 0.44 acre of potentially suitable habitat and 1,672.01 ft^2 of pine BA on 59.02 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,240.38 ft^2 of pine BA on 49.40 acres of suitable habitat, 1,034.70 ft^2 of pine BA on 27.09 acres of potentially suitable habitat and 2,229.33 ft^2 of pine BA on 72.81 acres of future potential habitat (Table 6-4).

The 2009 Construct Paved Training Area Roads Project (PN 65554) will remove 110.59 ft^2 of pine BA on 3.43 acres (Table 6-6 and Figure 6-9).

The post- project SMS foraging habitat totals were 3,765.60 ft^2 of pine BA on 88.64 acres of suitable habitat, 22.00 ft^2 of pine BA on 0.44 acre of potentially suitable habitat and 1,606.22 ft^2 of pine BA on 56.79 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 0.18% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,240.38 ft^2 of pine BA on 49.40 acres of suitable habitat, 994.80 ft^2 of pine BA on 26.04 acres of potentially suitable habitat and 2,158.64 ft^2 of pine BA on 70.43 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster K09-02R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,621.83 ft^2 of pine BA on 124.95 acres of suitable habitat, 102.00 ft^2 of pine BA on 2.04 acres of potentially suitable habitat and 478.76 ft^2 of pine BA on 26.19 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 97.71 ft^2 of pine BA on 2.44 acres of suitable habitat, 102.00 ft^2 of pine BA on 2.04 acres of potentially suitable habitat and 5,002.88 ft^2 of pine BA on 148.70 acres of future potential habitat (Table 6-4).

The 2009 Multi-purpose Training Range (MPTR) (PN 64551) will remove 834.77 ft^2 of pine BA on 30.87 acres. The MPTR construction limits will remove 300.86 ft^2 of pine BA on 10.99 acres (Table 6-6 and Figure 6-9). The MPTR beaten area will remove 41.37 ft^2 of pine BA on 2.51 acres (Table 6-8 and Figure 6-9).

The post- project SMS foraging habitat totals were 3,878.45 ft^2 of pine BA on 105.05 acres of suitable habitat, 102.00 ft^2 of pine BA on 2.04 acres of potentially suitable habitat and 45.14 ft^2 of pine BA on 1.72 acre of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 0.01% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 0.91 ft^2 of pine BA on 0.02 acre of suitable habitat, 102.00 ft^2 of pine BA on 2.04 acres of potentially suitable habitat and 3,922.68 ft^2 of pine BA on 106.75 acres of future potential habitat (Table 6-4). This partition cannot meet RS in the future (Table 6-15).

FB Cluster K09-03R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 5,160.01 ft^2 of pine BA on 144.42 acres of suitable habitat, 2,216.00 ft^2 of pine BA on 44.32 acres of potentially suitable habitat and 644.11 ft^2 of pine BA on 58.23 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,216.00 ft^2 of pine BA on 44.32 acres of potentially suitable habitat and 5,804.12 ft^2 of pine BA on 202.65 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 MPTR (PN 64551) will remove 50.63 ft^2 of pine BA on 1.47 acre. The 2009 Construct Paved Training Area Roads Project (PN 65554) will remove 403.28 ft^2 of pine BA on 15.75 acres (Table 6-6 and Figure 6-9).

The post- project SMS foraging habitat totals were 4,844.88 ft^2 of pine BA on 135.19 acres of suitable habitat, 2,185.50 ft^2 of pine BA on 43.71 acres of potentially suitable habitat and 535.83 ft^2 of pine BA on 50.85 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 26.37% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,185.50 ft^2 of pine BA on 43.71 acres of potentially suitable habitat and 5,380.71 ft^2 of pine BA on 186.04 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster K11-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 13 cavity trees in various stages of completion and suitability (Appendix G). The Construction of Paved Training Area Roads (PN 65554) will impact 5 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 8,250.23 ft^2 of pine BA on 219.20 acres of suitable habitat, 174.08 ft^2 of pine BA on 5.12 acres of potentially suitable habitat and 386.90 ft^2 of pine BA on 58.35 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,854.25 ft^2 of pine BA on 68.15 acres of suitable habitat and 5,956.96 ft^2 of pine BA on 214.52 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 MPTR (PN 64551) construction limits will remove 2,042.28 ft^2 of pine BA on 53.90 acres. The access road for the MPTR will remove 62.37 ft^2 of pine BA on 1.54 acre. The 2009 Construct Paved Training Area Roads Project (PN 65554) will remove 500.73 ft^2 of pine BA on 18.22 acres (Table 6-6 and Figure 6-9).

The post- project SMS foraging habitat totals were 5,902.93 ft^2 of pine BA on 159.86 acres of suitable habitat, 174.08 ft^2 of pine BA on 5.12 acres of potentially suitable habitat and 128.82 ft^2 of pine BA on 44.03 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 13.66% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,200.82 ft^2 of pine BA on 27.65 acres of suitable habitat and 5,005.01 ft^2 of pine BA on 181.36 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster K11-04R: This cluster was inactive from 2004 to 2006 but had a PBG in 2007 and 2008 (Table 6-5). It contained 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,730.88 ft^2 of pine BA on 46.50 acres of suitable habitat and 1,966.25 ft^2 of pine BA on 129.93 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 716.26 ft^2 of pine BA on 16.98 acres of suitable habitat and 2,980.87 ft^2 of pine BA on 159.45 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 MPTR (PN 64551) construction limits will remove 1,048.55 ft^2 of pine BA on 56.28 acres. The access road for the MPTR will remove 135.33 ft^2 of pine BA on 4.26 acres. The 2009 Construct Paved Training Area Roads Project (PN 65554) will remove 349.11 ft^2 of pine BA on 19.23 acres (Table 6-6 and Figure 6-9).

The post- project SMS foraging habitat totals were 1,349.14 ft^2 of pine BA on 37.21 acres of suitable habitat and 815.00 ft^2 of pine BA on 59.45 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to

loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 7.12% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 334.52 ft^2 of pine BA on 7.69 acres of suitable habitat and 1,829.62 ft^2 of pine BA on 88.97 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster K12-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). Construction of the MPTR (PN 64551) beaten area will impact 1 cavity tree within 51 to 200 feet and remove 6 cavity trees. These removals will result in "take" of the cluster by loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 5,735.15 ft^2 of pine BA on 137.11 acres of suitable habitat and 397.22 ft^2 of pine BA on 65.27 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 3,577.17 ft^2 of pine BA on 83.19 acres of suitable habitat and 2,555.20 ft^2 of pine BA on 119.19 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The MPTR (PN 64551) beaten area will remove 1,962.37 ft^2 of pine BA on 45.82 acres (Table 6-8 and Figure 6-9).

The post- project SMS foraging habitat totals were 3,772.78 ft^2 of pine BA on 91.29 acres of suitable habitat and 397.22 ft^2 of pine BA on 65.27 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 9.46% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,689.47 ft^2 of pine BA on 39.29 acres of suitable habitat and 2,480.53 ft^2 of pine BA on 117.27 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster K13-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 8 cavity trees in various stages of completion and suitability (Appendix G). Construction of the MPTR (PN 64551) beaten area will impact 1 cavity tree within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 4,397.26 ft^2 of pine BA on 92.47 acres of suitable habitat, 300.40 ft^2 of pine BA on 7.51 acres of potentially suitable habitat and 1,421.84 ft^2 of pine BA on 52.66 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,536.62 ft^2 of pine BA on 45.08 acres of suitable habitat and 3,582.88 ft^2 of pine BA on 107.56 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The MPTR (PN 64551) beaten area will remove 2,916.70 ft^2 of pine BA on 77.31 acres (Table 6-8 and Figure 6-9).

The post- project SMS foraging habitat totals were 1,970.84 ft^2 of pine BA on 34.09 acres of suitable habitat, 300.40 ft^2 of pine BA on 7.51 acres of potentially suitable habitat and 931.56 ft^2 of pine BA on 33.73 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 20.77% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,970.84 ft^2 of pine BA on 34.09 acres of suitable habitat and 1,231.97 ft^2 of pine BA on 41.24 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster K13-04: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). Construction of the MPTR (PN 64551) beaten area will remove all 10 cavity trees, resulting in "take" of the cluster by loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 1,779.47 ft^2 of pine BA on 54.07 acres of suitable habitat, 1,885.00 ft^2 of pine BA on 40.74 acres of potentially suitable habitat and 720.16 ft^2 of pine BA on 84.04 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 32.90 ft^2 of pine BA on 0.70 acre of potentially suitable habitat and 4,351.73 ft^2 of pine BA on 178.15 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The MPTR (PN 64551) beaten area will remove 2,340.61 ft^2 of pine BA on 93.77 acres (Table 6-8 and Figure 6-9).

The post- project SMS foraging habitat totals were 571.81 ft^2 of pine BA on 17.07 acres of suitable habitat, 752.05 ft^2 of pine BA on 15.84 acres of potentially suitable habitat and 720.16 ft^2 of pine BA on 52.17 acres of future potential habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 46.98% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 32.90 ft^2 of pine BA on 0.70 acre of potentially suitable habitat and 2,011.12 ft^2 of pine BA on 84.38 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster K13-05R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,538.46 ft^2 of pine BA on 55.07 acres of suitable habitat and 1,062.07 ft^2 of pine BA on 54.29 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,033.22 ft^2 of pine BA on 19.60 acres of suitable habitat, 996.15 ft^2 of pine BA on 22.90 acres of potentially suitable habitat and 1,571.16 ft^2 of pine BA on 66.86 acres of future potential habitat (Table 6-4).

The MPTR (PN 64551) beaten area will remove 545.81 ft^2 of pine BA on 17.28 acres (Table 6-8 and Figure 6-9).

The post- project SMS foraging habitat totals were 2,018.65 ft^2 of pine BA on 42.30 acres of suitable habitat and 1,036.07 ft^2 of pine BA on 49.78 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 3.07% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,020.47 ft^2 of pine BA on 19.35 acres of suitable habitat, 996.15 ft^2 of pine BA on 22.90 acres of potentially suitable habitat and 1,038.11 ft^2 of pine BA on 49.83 acres of future potential habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

FB Cluster K13-06: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,171.79 ft^2 of pine BA on 33.75 acres of suitable habitat, 5,483.35 ft^2 of pine BA on 129.48 acres of potentially suitable habitat and 0 ft^2 of pine BA on 46.70 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,564.95 ft^2 of pine BA on 75.85 acres of potentially suitable habitat and 3,090.19 ft^2 of pine BA on 134.08 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 22.40 ft^2 of pine BA on 5.28 acres (Table 6-7 and Figure 6-9).

The post- project SMS foraging habitat totals were 1,171.79 ft^2 of pine BA on 33.75 acres of suitable habitat, 5,460.95 ft^2 of pine BA on 128.85 acres of potentially suitable habitat and 0.00 ft^2 of pine BA on 42.05 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 35.18% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,564.95 ft^2 of pine BA on 75.85 acres of potentially suitable habitat and 3,067.79 ft^2 of pine BA on 128.80 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-14).

FB Cluster K21-02R: This cluster was inactive in 2005, but had a PBG in 2004, 2006, 2007 and 2008 (Table 6-5). It contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 7,509.92 ft^2 of pine BA on 175.02 acres of suitable habitat and 780.02 ft^2 of pine BA on 33.15 of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 2,639.38 ft^2 of pine BA on 51.25 acres of suitable habitat and 5,650.56 ft^2 of pine BA on 156.92 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Southern Training Area Infrastructure - Maneuver Area (PN 69743) will remove 1,394.69 ft^2 of pine BA on 36.85 acres (Table 6-6 and Figure 6-9).

The post- project SMS foraging habitat totals were 6,224.88 ft^2 of pine BA on 142.83 acres of suitable habitat and 670.37 ft^2 of pine BA on 28.49 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-14). Loblolly pine that is at high risk of decline accounts for 0.27% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,639.38 ft^2 of pine BA on 51.25 acres of suitable habitat and 4,255.87 ft^2 of pine BA on 120.07 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster K21-05R: This cluster had a PBG in 2007 and 2008 (Table 6-5) and had 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 10,454.52 ft^2 of pine BA on 245.38 acres of suitable habitat and 321.50 ft^2 of pine BA on 27.39 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 5,102.19 ft^2 of pine BA on 111.35 acres of suitable habitat, 112.53 ft^2 of pine BA on 2.42 acres of potentially suitable habitat and 5,561.30 ft^2 of pine BA on 159.00 acres of future potential habitat (Table 6-4).

The 2009 Southern Training Infrastructure - Maneuver Area (PN 69743) will remove 2,375.07 ft^2 of pine BA on 59.24 acres (Table 6-6 and Figure 6-10). The 2010 Repair Existing Training Area Roads Project (PN 65557) project will remove 396.03 ft^2 of pine BA on 9.57 acres (Table 6-7 and Figure 6-9).

The post- project SMS foraging habitat totals were 7,683.99 ft^2 of pine BA on 176.60 acres of suitable habitat and 320.93 ft^2 of pine BA on 27.36 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-13). Loblolly pine that is at high risk of decline accounts for 0.71% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,853.46 ft^2 of pine BA on 105.51 acres of suitable habitat, 112.53 ft^2 of pine BA on 2.42 acres of potentially suitable habitat and 3,038.93 ft^2 of pine BA on 96.03 acres of future potential habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

This cluster is a SRC and is therefore included in the Incidental Take Statement in the RCW ESMP BO due to training impacts; however, this "take" does not cover project impacts (USFWS 2002).

FB Cluster KPR-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 12 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,519.79 ft^2 of pine BA on 82.03 acres of suitable habitat, 2,869.86 ft^2 of pine BA on 67.75 acres of potentially suitable habitat and 501.11 ft^2 of pine BA on 27.50 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,987.70 ft^2 of pine BA on 60.42 acres of potentially suitable habitat and 4,903.06 ft^2 of pine BA on 116.86 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 1,014.56 ft^2 of pine BA on 21.65 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 3,909.16 ft^2 of pine BA on 71.40 acres of suitable habitat, 2,549.12 ft^2 of pine BA on 59.95 acres of potentially suitable habitat and 417.92 ft^2 of pine BA on 24.28 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 63.46% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,654.30 ft^2 of pine BA on 53.63 acres of potentially suitable habitat and 4,221.90 ft^2 of pine BA on 102.00 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster L02-02R: This cluster was inactive from 2004 to 2005, but had a PBG from 2006 to 2008 (Table 6-5). It had 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,613.67 ft^2 of pine BA on 117.31 acres of suitable habitat, 1,052.86 ft^2 of pine BA on 24.17 acres of potentially suitable habitat and 2,206.05 ft^2 of pine BA on 112.06 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,418.24 ft^2 of pine BA on 90.79 acres of suitable habitat, 1,080.91 ft^2 of pine BA on 19.84 acres of potentially suitable habitat and 3,373.43 ft^2 of pine BA on 142.91 acres of future potential habitat (Table 6-4).

The 2009 Training Area Infrastructure-19D/K OSUT (PN 69741) will remove 2,064.38 ft^2 of pine BA on 65.75 acres. The 2009 Construct Training Area Roads Project (PN 65554) will remove 113.16 ft^2 of pine BA on 3.13 acres (Table 6-6 and Figure 6-6). The 2010 Repair

Existing Training Area Roads Project (PN 65557) will remove 222.22 ft^2 of pine BA on 9.55 acres (Table 6-7 and Figure 6-6). As a result of project impacts, 1,845.66 ft^2 of pine BA on 63.85 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 2,796.21 ft^2 of pine BA on 71.02 acres of suitable habitat, 169.50 ft^2 of pine BA on 5.65 acres of potentially suitable habitat and 661.44 ft^2 of pine BA on 34.31 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 0.77% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,428.04 ft^2 of pine BA on 64.49 acres of suitable habitat, 303.75 ft^2 of pine BA on 4.86 acres of potentially suitable habitat and 895.36 ft^2 of pine BA on 41.63 acres of future potential habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects. In addition, it is a SRC and is therefore included in the Incidental Take Statement in the RCW ESMP BO due to training impacts; however, this "take" does not cover project impacts (USFWS 2002).

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FB Cluster L03-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 9 cavity trees in various stages of completion and suitability (Appendix G). The Training Area Infrastructure (19D/K OSUT) (PN 69741) will have impacts within 51 to 200 feet of 4 cavity trees and remove 1 inactive start tree (Table 6-10).

The pre- project SMS foraging habitat totals were 1,966.83 ft^2 of pine BA on 41.59 acres of suitable habitat, 399.76 ft^2 of pine BA on 8.90 acres of potentially suitable habitat and 1,140.23 ft^2 of pine BA on 57.40 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,472.04 ft^2 of pine BA on 27.26 acres of suitable habitat, 238.13 ft^2 of pine BA on 4.59 acres of potentially suitable habitat and 1,796.65 ft^2 of pine BA on 76.04 acres of future potential habitat (Table 6-4).

The 2009 Training Area Infrastructure-19D/K OSUT Project (PN 69741) will remove 832.93 ft^2 of pine BA on 21.56 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing

Training Area Roads Project (PN 65557) will remove 264.77 ft^2 of pine BA on 10.31 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 1,357.55 ft^2 of pine BA on 27.25 acres of suitable habitat, 233.22 ft^2 of pine BA on 5.13 acres of potentially suitable habitat and 818.35 ft^2 of pine BA on 41.70 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 14.48% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,081.08 ft^2 of pine BA on 20.02 acres of suitable habitat, 147.34 ft^2 of pine BA on 2.84 acres of potentially suitable habitat and 1,180.70 ft^2 of pine BA on 51.22 acres of future potential habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster M01-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,133.46 ft^2 of pine BA on 48.31 acres of suitable habitat and 1,323.19 ft^2 of pine BA on 65.14 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,925.10 ft^2 of pine BA on 42.78 acres of potentially suitable habitat and 1,531.55 ft^2 of pine BA on 70.67 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 127.25 ft^2 of pine BA on 3.79 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,057.62 ft^2 of pine BA on 46.62 acres of suitable habitat and 1,271.78 ft^2 of pine BA on 63.04 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-

12). Loblolly pine that is at high risk of decline accounts for 5.60% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,867.50 ft^2 of pine BA on 41.50 acres of potentially suitable habitat and 1,461.90 ft^2 of pine BA on 68.16 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster M08-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 9 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 1 cavity tree within 50 feet, 4 cavity trees within 51 to 200 feet and will remove 1 inactive cavity tree and 1 active start tree (Table 6-10). These impacts and removals will likely result in "take" of the cluster by harassment (Table 6-12).

The pre- project SMS foraging habitat totals were 5,256.85 ft^2 of pine BA on 115.13 acres of suitable habitat, 758.48 ft^2 of pine BA on 19.96 acres of potentially suitable habitat and 3,323.74 ft^2 of pine BA on 133.14 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 9,339.07 ft^2 of pine BA on 268.23 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 654.17 ft^2 of pine BA on 18.35 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 4,742.82 ft^2 of pine BA on 103.08 acres of suitable habitat, 758.48 ft^2 of pine BA on 19.96 acres of potentially suitable habitat and 3,183.60 ft^2 of pine BA on 126.84 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 24.46% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 8,684.90 ft^2 of pine BA on 249.88 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster M08-02a: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing

Training Roads (Phase I) (PN 65557) will have impacts within 51 to 200 feet of 1 cavity tree (Table 6-10).

The pre- project SMS foraging habitat totals were 5,686.47 ft^2 of pine BA on 123.64 acres of suitable habitat, 830.68 ft^2 of pine BA on 17.25 acres of potentially suitable habitat and 286.45 ft^2 of pine BA on 17.55 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,479.35 ft^2 of pine BA on 46.60 acres of suitable habitat, 1,246.00 ft^2 of pine BA on 31.53 acres of potentially suitable habitat and 3,078.25 ft^2 of pine BA on 80.31 acres of future potential habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 435.87 ft^2 of pine BA on 9.16 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 5,277.35 ft^2 of pine BA on 114.98 acres of suitable habitat, 803.93 ft^2 of pine BA on 16.75 acres of potentially suitable habitat and 286.45 ft^2 of pine BA on 17.55 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 7.67% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,128.54 ft^2 of pine BA on 39.53 acres of suitable habitat, 1,246.00 ft^2 of pine BA on 31.53 acres of potentially suitable habitat and 2,993.19 ft^2 of pine BA on 78.22 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster M08-02b: This cluster had a PBG from 2005 to 2008 (Table 6-5) and had 5 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 2 cavity trees within 50 feet, 1 cavity tree within 51 to 200 feet and will remove 1 active cavity tree (Table 6-10). These impacts and removals will likely result in "take" of the cluster by harassment (Table 6-12).

The pre- project SMS foraging habitat totals were 3,351.79 ft^2 of pine BA on 75.99 acres of suitable habitat, 374.84 ft^2 of pine BA on 10.35 acres of potentially suitable habitat and 663.06 ft^2 of pine BA on 30.41 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,418.76 ft^2 of pine BA on 31.08 acres of suitable habitat, 812.45 ft^2 of pine BA on 17.97 acres of potentially suitable habitat and 2,158.48 ft^2 of pine BA on 67.70 acres of future potential habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 549.03 ft^2 of pine BA on 14.92 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,938.65 ft^2 of pine BA on 66.63 acres of suitable habitat, 374.84 ft^2 of pine BA on 10.35 acres of potentially suitable habitat and 527.17 ft^2 of pine BA on 24.85 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 1.48% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,255.32 ft^2 of pine BA on 27.38 acres of suitable habitat, 634.13 ft^2 of pine BA on 14.03 acres of potentially suitable habitat and 1,998.62 ft^2 of pine BA on 62.36 acres of future potential habitat (Table 6-4). This partition cannot meet the RS in the future (Table 6-15).

FB Cluster M08-04R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,894.52 ft^2 of pine BA on 52.64 acres of suitable habitat, 1,383.53 ft^2 of pine BA on 42.57 acres of potentially suitable habitat and 2,140.82 ft^2 of pine BA on 100.17 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,418.87 ft^2 of pine BA on 195.38 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Training Area Infrastructure-19D/K OSUT (PN 69741) will remove 66.12 ft^2 of pine BA on 3.02 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 177.46 ft^2 of pine BA on 8.37 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 1,758.62 ft^2 of pine BA on 48.56 acres of suitable habitat, 1,383.53 ft^2 of pine BA on 42.57 acres of potentially suitable habitat and 2,033.14 ft^2 of pine BA on 92.86 acres of future potential habitat (Table 6-3). This cluster will

not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 36.32% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,175.29 ft^2 of pine BA on 183.99 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster M08-05R: This cluster had a PBG in 2004, 2005, 2006 and 2008 and a solitary male in 2007 (Table 6-5). It had 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,240.06 ft^2 of pine BA on 94.72 acres of suitable habitat, 3,652.10 ft^2 of pine BA on 84.06 acres of potentially suitable habitat and 1,182.08 ft^2 of pine BA on 73.04 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,014.73 ft^2 of pine BA on 15.98 acres of potentially suitable habitat and 8,059.51 ft^2 of pine BA on 235.84 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade Project (PN 69742) will remove 20.84 ft^2 of pine BA on 1.04 acre (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 149.40 ft^2 of pine BA on 7.04 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 4,230.44 ft^2 of pine BA on 94.46 acres of suitable habitat, 3,594.77 ft^2 of pine BA on 82.22 acres of potentially suitable habitat and 1,078.79 ft^2 of pine BA on 67.06 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 39.42% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,014.73 ft^2 of pine BA on 15.98 acres of potentially suitable habitat and 7,889.27 ft^2 of pine BA on 227.76 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster N01-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,522.32 ft^2 of pine BA on 65.26 acres of suitable habitat, 1,339.39 ft^2 of pine BA on 29.33 acres of potentially suitable habitat and 351.12 ft^2 of pine BA on 33.59 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 938.86 ft^2 of pine BA on 20.41 acres of suitable habitat, 502.08 ft^2 of pine BA on 10.46 acres of potentially suitable habitat and 2,890.39 ft^2 of pine BA on 100.31 acres of future potential habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 156.85 ft^2 of pine BA on 4.36 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,484.10 ft^2 of pine BA on 64.28 acres of suitable habitat, 1,241.16 ft^2 of pine BA on 26.97 acres of potentially suitable habitat and 330.72 ft^2 of pine BA on 32.57 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 44.25% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 938.86 ft^2 of pine BA on 20.41 acres of suitable habitat, 502.08 ft^2 of pine BA on 10.46 acres of potentially suitable habitat and 2,733.54 ft^2 of pine BA on 95.95 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster O01-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 14 cavity trees in various stages of completion and suitability (Appendix G). The Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 6 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 4,120.49 ft^2 of pine BA on 110.72 acres of suitable habitat, 935.95 ft^2 of pine BA on 28.35 acres of potentially suitable habitat and 47.78 ft^2 of pine BA on 9.25 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,482.92 ft^2 of pine BA on 34.25 acres of suitable habitat, 2.05 ft^2 of pine BA on 0.05 acre of potentially suitable habitat and 3,619.25 ft^2 of pine BA on 114.02 acres of future potential habitat (Table 6-4).

The 2009 Training Area Infrastructure (19D/K OSUT) Tank Trail Upgrade (PN 69741) will remove 303.84 ft^2 of pine BA on 8.03 acres. The 2009 Northern Training Area Infrastructure (PN 69742) will remove 95.33 ft^2 of pine BA on 2.31 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,730.60 ft^2 of pine BA on 100.72 acres of suitable habitat, 935.95 ft^2 of pine BA on 28.35 acres of potentially suitable habitat and 38.50 ft^2 of pine BA on 8.91 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 18.39% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,318.94 ft^2 of pine BA on 30.52 acres of suitable habitat, 2.05 ft^2 of pine BA on 0.05 acre of potentially suitable habitat and 3,384.06 ft^2 of pine BA on 107.41 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster O01-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). The Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 3 cavity trees within 50 feet and 2 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 877.11 ft^2 of pine BA on 24.05 acres of suitable habitat, 498.56 ft^2 of pine BA on 12.16 acres of potentially suitable habitat and 2,236.35 ft^2 of pine BA on 112.46 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 76.32 ft^2 of pine BA on 2.12 acres of suitable habitat, 498.56 ft^2 of pine BA on 12.16 acres of potentially suitable habitat and 3,037.14 ft^2 of pine BA on 134.39 acres of future potential habitat (Table 6-4).

The 2009 Training Area Infrastructure-19D/K OSUT Tank Trail Upgrade (PN 69741) will remove 213.71 ft^2 of pine BA on 8.19 acres (Table 6-6 and Figure 6-6). The 2010 Repair

Existing Training Area Roads Project (PN 65557) will remove 311.70 ft^2 of pine BA on 11.76 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 669.58 ft^2 of pine BA on 18.44 acres of suitable habitat, 473.55 ft^2 of pine BA on 11.55 acres of potentially suitable habitat and 1,943.48 ft^2 of pine BA on 98.73 acres of future potential habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 5.84% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 74.88 ft^2 of pine BA on 2.08 acres of suitable habitat, 473.55 ft^2 of pine BA on 11.55 acres of potentially suitable habitat and 2,538.18 ft^2 of pine BA on 115.09 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-14).

FB Cluster O01-03: This cluster had a PBG in 2004, 2005, 2006 and 2008 but was captured by O03-02 in 2007 (Table 6-5). It had 8 cavity trees in various stages of completion and suitability (Appendix G). The Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will impact 4 cavity trees within 51 to 200 feet. In addition, the Repair of Existing Training Roads (Phase I) (PN 65557) will impact 3 different cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 3,768.47 ft^2 of pine BA on 86.23 acres of suitable habitat, 1,079.14 ft^2 of pine BA on 23.52 acres of potentially suitable habitat and 745.27 ft^2 of pine BA on 40.74 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 156.91 ft^2 of pine BA on 3.35 acres of suitable habitat and 5,435.97 ft^2 of pine BA on 147.14 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will remove 350.74 ft^2 of pine BA on 10.47 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 319.28 ft^2 of pine BA on 12.71 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,524.44 ft^2 of pine BA on 81.14 acres of suitable habitat, 881.94 ft^2 of pine BA on 19.18 acres of potentially suitable habitat and 516.48 ft^2 of pine BA on 26.99 acres of future potential habitat (Table 6-3). This cluster will not be

taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 32.04% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 102.58 ft^2 of pine BA on 2.19 acres of suitable habitat and 4,820.28 ft^2 of pine BA on 125.12 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition may meet the RS in the future (Table 6-15).

FB Cluster O01-04R: This cluster had a PBG in 2004, 2005, 2006 and 2008 but had a solitary male in 2007 (Table 6-5). It contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,058.33 ft^2 of pine BA on 48.70 acres of suitable habitat, 2,922.05 ft^2 of pine BA on 72.87 acres of potentially suitable habitat and 819.75 ft^2 of pine BA on 47.54 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 0.76 ft^2 of pine BA on 0.01 acre of suitable habitat and 5,799.37 ft^2 of pine BA on 169.10 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will remove 300.81 ft^2 of pine BA on 10.34 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 378.36 ft^2 of pine BA on 11.98 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 1,803.90 ft^2 of pine BA on 42.18 acres of suitable habitat, 2,677.87 ft^2 of pine BA on 66.57 acres of potentially suitable habitat and 639.19 ft^2 of pine BA on 38.04 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 15.73% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 0.76 ft^2 of pine BA on 0.01 acre of suitable habitat and 5,120.20 ft^2 of pine BA on 146.78 acres of future potential habitat (Table 6-

4). There was no potentially suitable habitat. This partition may meet the RS in the future (Table 6-15).

FB Cluster O02-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,430.15 ft^2 of pine BA on 54.69 acres of suitable habitat, 2,560.76 ft^2 of pine BA on 61.30 acres of potentially suitable habitat and 1,889.73 ft^2 of pine BA on 103.56 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,738.00 ft^2 of pine BA on 37.31 acres of suitable habitat, 2,416.13 ft^2 of pine BA on 56.85 acres of potentially suitable habitat and 2,726.51 ft^2 of pine BA on 125.39 acres of future potential habitat (Table 6-4).

The 2010 Repair Existing Training Area Roads project (PN 65557) will remove 459.92 ft^2 of pine BA on 18.07 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,114.45 ft^2 of pine BA on 46.87 acres of suitable habitat, 2,490.70 ft^2 of pine BA on 59.48 acres of potentially suitable habitat and 1,815.57 ft^2 of pine BA on 95.13 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 3.35% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,654.90 ft^2 of pine BA on 35.46 acres of suitable habitat, 2,369.80 ft^2 of pine BA on 55.76 acres of potentially suitable habitat and 2,396.02 ft^2 of pine BA on 110.26 acres of future potential habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

FB Cluster O03-01: This cluster was inactive in 2004 but had a PBG from 2005 to 2008 (Table 6-5). It contained 9 cavity trees in various stages of completion and suitability (Appendix G). The Northern Training Area Infrastructure (PN 69742) will impact 1 cavity tree within 50 feet, 2 cavity trees within 51 to 200 feet and will remove 6 cavity trees (Table 6-10) . This will result in "take" of the cluster from loss of cavity trees (Table 6-12).

The pre- project SMS foraging habitat totals were 669.02 ft^2 of pine BA on 16.68 acres of suitable habitat, 1,063.85 ft^2 of pine BA on 29.59 acres of potentially suitable habitat and 1,109.74 ft^2 of pine BA on 47.03 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 936.95 ft^2 of pine BA on 26.77 acres of potentially suitable habitat and 1,905.66 ft^2 of pine BA on 66.53 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will remove 331.90 ft^2 of pine BA on 11.28 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 629.02 ft^2 of pine BA on 15.68 acres of suitable habitat, 896.25 ft^2 of pine BA on 24.85 acres of potentially suitable habitat and 985.44 ft^2 of pine BA on 41.49 acres of future potential habitat (Table 6-3). This cluster will also be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 23.44% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 777.00 ft^2 of pine BA on 22.20 acres of potentially suitable habitat and 1,733.71 ft^2 of pine BA on 59.82 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition cannot meet RS in the future (Table 6-14).

FB Cluster O03-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 1 cavity tree within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 4,712.84 ft^2 of pine BA on 116.42 acres of suitable habitat and 648.55 ft^2 of pine BA on 47.04 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 2,669.80 ft^2 of pine BA on 63.17 acres of suitable habitat, 293.55 ft^2 of pine BA on 5.70 acres of potentially suitable habitat and 2,398.04 ft^2 of pine BA on 94.59 acres of future potential habitat (Table 6-4).

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will remove 379.23 ft^2 pine BA on 10.75 acres. The 2009 Construct Training Area Roads Project

(PN 65554) will remove 154.45 ft^2 of pine BA on 6.97 acres. The 2009 Access Road for Z2 (PN 65036) will remove 17.28 ft^2 of pine BA on 0.42 acre (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 524.64 ft^2 of pine BA on 14.01 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,835.16 ft^2 of pine BA on 95.65 acres of suitable habitat and 450.63 ft^2 of pine BA on 35.66 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 1.55% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,079.83 ft^2 of pine BA on 49.28 acres of suitable habitat, 190.03 ft^2 of pine BA on 3.69 acres of potentially suitable habitat and 2,015.93 ft^2 of pine BA on 78.34 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster O03-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 9 cavity trees in various stages of completion and suitability (Appendix G). The Northern Training Area Infrastructure (PN 69742) will impact 2 cavity trees within 50 feet, 1 cavity tree within 51 to 200 feet and remove 2 active cavity trees and 2 inactive cavity trees. In addition, the Repair of Existing Training Roads (Phase I) (PN 65557) will impact 1 cavity tree within 50 feet and 2 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 2,007.64 ft^2 of pine BA on 45.82 acres of suitable habitat and 1,272.13 ft^2 of pine BA on 116.60 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,165.32 ft^2 of pine BA on 22.41 acres of suitable habitat and 2,671.25 ft^2 of pine BA on 155.51 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will remove 275.13 ft^2 pine BA on 10.25 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 288.02 ft^2 of pine BA on 13.45 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 1,609.69 ft^2 of pine BA on 37.27 acres of suitable habitat and 1,106.93 ft^2 of pine BA on 101.45 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 39.50% of the SMS post-project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 877.24 ft^2 of pine BA on 16.87 acres of suitable habitat and 2,396.18 ft^2 of pine BA on 137.35 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster O03-04: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). The Northern Training Area Infrastructure (PN 69742) will impact 5 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 1,037.71 ft^2 of pine BA on 30.00 acres of suitable habitat, 254.34 ft^2 of pine BA on 6.36 acres of potentially suitable habitat and 2,012.23 ft^2 of pine BA on 156.50 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,304.28 ft^2 of pine BA on 192.86 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Upgrade (PN 69742) will remove 356.64 ft^2 pine BA on 22.92 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 105.20 ft^2 of pine BA on 4.78 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 861.16 ft^2 of pine BA on 24.74 acres of suitable habitat, 254.34 ft^2 of pine BA on 6.36 acres of potentially suitable habitat and 1,726.94 ft^2 of pine BA on 134.06 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 37.11% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,842.44 ft^2 of pine BA on 165.16 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster O03-05: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 10 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 2 cavity trees within 50 feet and 7 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 6,474.35 ft^2 of pine BA on 152.93 acres of suitable habitat, 1,676.66 ft^2 of pine BA on 43.54 acres of potentially suitable habitat and 570.39 ft^2 of pine BA on 71.71 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,179.14 ft^2 of pine BA on 69.35 acres of suitable habitat and 5,542.26 ft^2 of pine BA on 198.83 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 756.92 ft^2 of pine BA on 25.70 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 5,979.87 ft^2 of pine BA on 140.19 acres of suitable habitat, 1,481.92 ft^2 of pine BA on 38.61 acres of potentially suitable habitat and 502.69 ft^2 of pine BA on 63.68 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 25.49% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,938.48 ft^2 of pine BA on 63.25 acres of suitable habitat and 5,026.00 ft^2 of pine BA on 179.23 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster O03-06R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,283.33 ft^2 of pine BA on 122.32 acres of suitable habitat and 3,469.15 ft^2 of pine BA on 143.78 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 7,752.48 ft^2 of pine BA on 266.10 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Northern Training Area Infrastructure Tank Trail Construction and Upgrade (PN 69742) will remove 1,006.11 ft^2 pine BA on 31.32 acres. The 2009 Support Staging Area (PN 69742) will remove 113.48 ft^2 pine BA on 3.71 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,519.34 ft^2 of pine on 99.98 acres of suitable habitat and 3,113.55 ft^2 of pine BA on 131.09 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 34.61% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 6,632.89 ft^2 of pine BA on 231.07 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster O03-07: This cluster had a PBG from 2006 to 2008 (Table 6-5); it contained 5 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 5,086.28 ft^2 of pine BA on 122.38 acres of suitable habitat and 507.19 ft^2 of pine BA on 56.01 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 5,593.47 ft^2 of pine BA on 178.39 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 415.76 ft^2 of pine BA on 10.79 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 4,670.52 ft^2 of pine BA on 111.96 acres of suitable habitat and 507.19 ft^2 of pine BA on 55.64 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the

cluster level (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 44.59% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,177.71 ft^2 of pine BA on 167.60 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

This cluster is a SRC and is therefore included in the Incidental Take Statement in the RCW ESMP BO due to training impacts; however, this "take" does not cover project impacts (USFWS 2002).

FB Cluster O04-01: This cluster had a PBG in 2004, 2006, 2007 and 2008 and was captured by O04-03b in 2005 (Table 6-5). It had 7 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 1 cavity tree within 50 feet, 3 cavity trees within 51 to 200 feet and will remove 1 inactive insert cavity tree and 1 active cavity (Table 6-10). This will result in "take" of the cluster from loss of cavity trees (Tables 6-12).

The pre- project SMS foraging habitat total was 1,778.52 ft^2 of pine BA on 73.17 acres of future potential habitat (Table 6-3). There was no suitable or potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,778.52 ft^2 of pine BA on 73.17 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 355.84 ft^2 of pine BA on 14.67 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat total was 1,422.68 ft^2 of pine BA on 58.50 acres of future potential habitat (Table 6-3). There was no suitable or potentially suitable habitat. This cluster will also be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,422.68 ft^2 of pine BA on 58.50 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster O04-03a: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 3 cavity trees within 50 feet (Table 6-10).

The pre- project SMS foraging habitat total was 1,627.87 ft^2 of pine BA on 75.69 acres of future potential habitat (Table 6-3). There was no suitable or potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,627.87 ft^2 of pine BA on 75.69 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 47.52 ft^2 of pine BA on 2.21 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat total was 1,580.35 ft^2 of pine BA on 73.48 acres of future potential habitat (Table 6-3). There was no suitable or potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,580.35 ft^2 of pine BA on 73.48 acres of future potential habitat. (Table 6-4) There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster O04-03b: This cluster had a PBG from 2005 to 2008 (Table 6-5) and had 5 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 2 cavity trees within 50 feet and remove 2 active cavity trees and 1 inactive start tree, resulting in "take" of the cluster from loss of cavity trees (Tables 6-10 and 6-12).

The pre- project SMS foraging habitat totals were 1,262.54 ft^2 of pine BA on 26.18 acres of suitable habitat and 800.44 ft^2 of pine BA on 56.21 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 627.45 ft^2 of pine BA on 13.35 acres of suitable habitat and 2,132.56 ft^2 of pine BA on 105.38 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

Under the SMS, the 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 327.24 ft^2 of pine BA on 11.52 acres (Table 6-7 and Figure 6-6).

Under the RSG, the 2009 Northern Training Area Infrastructure Project (PN 69742) will remove 117.80 ft^2 of pine BA on 3.88 acres. The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 401.95 ft^2 of pine BA on 15.23 acres (Table 6-4 and Figure 6-6).

The post- project SMS foraging habitat totals were 1,057.15 ft^2 of pine BA on 21.81 acres of suitable habitat and 678.59 ft^2 of pine BA on 49.06 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 5.41% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 422.06 ft^2 of pine BA on 8.98 acres of suitable habitat and 1,818.20 ft^2 of pine BA on 90.64 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster O05-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 14 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 11,209.36 ft^2 of pine BA on 220.28 acres of suitable habitat, 671.22 ft^2 of pine BA on 8.60 acres of potentially suitable habitat and 620.57 ft^2 of pine BA on 46.87 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 660.92 ft^2 of pine BA on 13.36 acres of suitable habitat, 6,677.13 ft^2 of pine BA on 130.79 acres of potentially suitable habitat and 5,163.10 ft^2 of pine BA on 131.60 acres of future potential habitat (Table 6-4).

The 2009 Construction Limits for Modified Record Fire Range (MRF1) (PN 65043) will remove 36.34 ft^2 pine BA on 0.71 acre. The 2009 Modified Fire Range (MRF7) (PN 65049) will remove 36.19 ft^2 of pine BA on 0.76 acre. The MRF7 construction limits will remove 488.31 ft^2 of pine BA on 8.92 acres. The MRF7 access road will remove 109.05 ft^2 of pine BA on 2.29 acres. The 2009 Construct Training Area Roads Project (PN 65554) will remove 351.64 ft^2 pine

BA on 7.10 acres (Table 6-6 and Figure 6-8). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 388.99 ft^2 pine BA on 9.16 acres (Table 6-7 and Figure 6-8).

The post- project SMS foraging habitat totals were 10,093.70 ft^2 of pine BA on 197.28 acres of suitable habitat, 515.36 ft^2 of pine BA on 6.85 acres of potentially suitable habitat and 481.57 ft^2 of pine BA on 42.68 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 23.72% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 539.22 ft^2 of pine BA on 10.90 acres of suitable habitat, 6,390.80 ft^2 of pine BA on 125.11 acres of potentially suitable habitat and 4,160.61 ft^2 of pine BA on 110.80 acres of future potential habitat (Table 6-4). This partition meets the RS (Table 6-15).

FB Cluster O05-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 7 cavity trees in various stages of completion and suitability (Appendix G). The Repair of Existing Training Roads (Phase I) (PN 65557) will impact 5 cavity trees within 51 to 200 feet and remove 1 inactive cavity tree (Table 6-10).

The pre- project SMS foraging habitat totals were 3,884.27 ft^2 of pine BA on 92.95 acres of suitable habitat, 468.35 ft^2 of pine BA on 10.36 acres of potentially suitable habitat and 813.56 ft^2 of pine BA on 31.46 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 543.72 ft^2 of pine BA on 10.99 acres of suitable habitat and 4,622.46 ft^2 of pine BA on 123.78 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Basic 10M-25M Firing Range (Z2) (PN 65036) construction limits will remove 149.46 ft^2 pine BA on 4.29 acres. The Z2 access road will remove 234.62 ft^2 pine BA on 5.24 acres. The 2009 MRF7 (PN 65049) will remove 614.72 ft^2 of pine BA on 16.78 acres. The MRF7 construction limits will remove 587.11 ft^2 of pine BA on 12.83 acres (Table 6-6 and Figure 6-8). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 258.37 ft^2 of pine BA on 6.72 acres (Table 6-7 and Figure 6-8). The 2011 Z2 beaten area (PN 65036) will remove 291.19 ft^2 of pine BA on 10.04 acres. The MRF7 beaten area (PN 65049) will remove 401.43 ft^2 of pine BA on 10.12 acres (Table 6-8 and Figure 6-8). As a result of

project impacts, 104.37 ft^2 of pine BA on 3.29 acres will become non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 2,524.91 ft^2 of pine BA on 61.60 acres of suitable habitat and 0.00 ft^2 of pine BA on 3.86 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 3.04% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 488.30 ft^2 of pine BA on 9.87 acres of suitable habitat and 2,036.60 ft^2 of pine BA on 55.59 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet RS in the future (Table 6-14).

FB Cluster O05-03R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 7,748.62 ft^2 of pine BA on 181.66 acres of suitable habitat, 471.90 ft^2 of pine BA on 11.91 acres of potentially suitable habitat and 804.24 ft^2 of pine BA on 44.45 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,495.36 ft^2 of pine BA on 72.82 acres of suitable habitat and 5,529.40 ft^2 of pine BA on 165.20 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Basic 10M-25M Firing Range (Z1) (PN 65035) will remove 17.22 ft^2 of pine BA on 0.50 acre. The Z1 construction limits will remove 128.01 ft^2 of pine BA on 3.60 acres. The 2009 MRF1 (PN 65043) will remove 0 ft^2 of pine BA on 1.62 acre. The MRF1 construction limits will remove 224.10 ft^2 of pine BA on 11.19 acres (Table 6-6 and Figure 6-8). The Z1 beaten area will remove 48.97 ft^2 of pine BA on 1.18 acre. The Z2 beaten area will remove 54.96 ft^2 of pine BA on 4.44 acres. The MRF1 beaten area will remove 723.25 ft^2 of pine BA on 17.88 acres. The MRF7 beaten area will remove 538.88 ft^2 of pine BA on 15.50 acres (Table 6-8 and Figure 6-8).

The post- project SMS foraging habitat totals were 6,654.37 ft^2 of pine BA on 154.70 acres of suitable habitat, 84.42 ft^2 of pine BA on 2.43 acres of potentially suitable habitat and 550.58 ft^2 of pine BA on 24.98 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 20.41% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,492.96 ft^2 of pine BA on 72.77 acres of suitable habitat and 3,796.41 ft^2 of pine BA on 109.34 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster O07-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 5,676.85 ft^2 of pine BA on 131.74 acres of potentially suitable habitat and 1,157.39 ft^2 of pine BA on 96.33 acres of future potential habitat (Table 6-3). There was no suitable habitat.

The pre- project RS foraging habitat totals were 6,834.24 ft^2 of pine BA on 228.07 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Fire and Movement Range (FM2) (PN 65033) will remove 210.90 ft^2 of pine BA on 8.19 acres. The FM2 construction limits will remove 564.70 ft^2 of pine BA on 26.58 acres. The FM2 access road will remove 516.06 ft^2 of pine BA on 12.58 acres (Table 6-6 and Figure 6-8). The 2011 FM2 beaten area will remove 79.52 ft^2 of pine BA on 2.79 acres (Table 6-8 and Figure 6-8).

The post- project SMS foraging habitat totals were 5,159.54 ft^2 of pine BA on 119.61 acres of potentially suitable habitat and 303.52 ft^2 of pine BA on 58.32 acres of future potential habitat (Table 6-3). There was no suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 66.96% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,463.06 ft^2 of pine BA on 177.93 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This cluster can meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-12).

FB Cluster O07-03R: This cluster was inactive in 2006 but had a PBG in 2004, 2005, 2007 and 2008 (Table 6-5). It had 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,900.77 ft^2 of pine BA on 73.17 acres of suitable habitat, 2,464.09 ft^2 of pine BA on 75.33 acres of potentially suitable habitat and 4,581.38 ft^2 of pine BA on 197.63 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 0.40 ft^2 of pine BA on 0.01 acre of suitable habitat and 9,945.84 ft^2 of pine BA on 346.12 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Construct Training Area Roads Project (PN 65554) will remove 582.20 ft^2 of pine BA on 20.17 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,551.14 ft^2 of pine BA on 63.83 acres of suitable habitat, 2,464.09 ft^2 of pine BA on 75.33 acres of potentially suitable habitat and 4,348.81 ft^2 of pine BA on 186.80 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 84.77% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 0.40 ft^2 of pine BA on 0.01 acre of suitable habitat and 9,363.64 ft^2 of pine BA on 325.95 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-12).

FB Cluster O08-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 13 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 412.93 ft^2 of pine BA on 13.06 acres of suitable habitat, 876.00 ft^2 of pine BA on 23.36 acres of potentially suitable habitat and 3,799.26 ft^2 of pine BA on 192.50 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,088.19 ft^2 of pine BA on 228.92 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Construct Training Area Roads Project (PN 65554) will remove 321.96 ft^2 of pine BA on 12.67 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 136.14 ft^2 of pine BA on 6.79 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 316.36 ft^2 of pine BA on 10.01 acres of suitable habitat, 745.50 ft^2 of pine BA on 19.88 acres of potentially suitable habitat and 3,568.23 ft^2 of pine BA on 179.57 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 49.98% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,630.09 ft^2 of pine BA on 209.46 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster O08-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 8 cavity trees in various stages of completion and suitability (Appendix G). The 2009 Construct Training Area Roads Project (PN 65554) will impact 2 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 1,800.51 ft^2 of pine BA on 43.69 acres of suitable habitat, 1,268.46 ft^2 of pine BA on 34.00 acres of potentially suitable habitat and 4,127.10 ft^2 of pine BA on 199.56 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 925.38 ft^2 of pine BA on 19.08 acres of potentially suitable habitat and 6,270.69 ft^2 of pine BA on 258.17 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 Construct Training Area Roads Project (PN 65554) will remove 516.85 ft^2 of pine BA on 17.80 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 1,668.94 ft^2 of pine BA on 39.99 acres of suitable habitat, 1,268.46 ft^2 of pine BA on 34.00 acres of potentially suitable habitat and 3,741.82 ft^2 of pine BA on 185.46 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 43.98% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 925.38 ft^2 of pine BA on 19.08 acres of potentially suitable habitat and 5,753.84 ft^2 of pine BA on 240.37 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster O09-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 9 cavity trees in various stages of completion and suitability (Appendix G). The construction of the Stationary Tank Range (ST2) (PN 65383) and beaten area will impact 2 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 3,003.15 ft^2 of pine BA on 68.56 acres of suitable habitat, 400.89 ft^2 of pine BA on 8.58 acres of potentially suitable habitat and 2,906.97 ft^2 of pine BA on 116.17 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 2,111.69 ft^2 of pine BA on 43.54 acres of potentially suitable habitat and 4,199.32 ft^2 of pine BA on 149.77 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 ST2 (PN 65383) will remove 783.52 ft^2 of pine BA on 30.40 acres. The ST2 construction limits will remove 316.62 ft^2 of pine BA on 12.65 acres (Table 6-6 and Figure 6-6). The 2011 ST2 beaten area will remove 25.65 ft^2 of pine BA on 1.35 acre (Table 6-8 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,003.15 ft^2 of pine BA on 68.56 acres of suitable habitat, 400.89 ft^2 of pine BA on 8.58 acres of potentially suitable habitat and 1,781.17 ft^2 of pine BA on 71.77 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-9).

Loblolly pine that is at high risk of decline accounts for 18.65% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,111.69 ft^2 of pine BA on 43.54 acres of potentially suitable habitat and 3,073.52 ft^2 of pine BA on 105.37 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition may meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-12).

FB Cluster O10-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 9 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,406.60 ft^2 of pine BA on 43.28 acres of suitable habitat, 2,590.59 ft^2 of pine BA on 69.18 acres of potentially suitable habitat and 1,242.64 ft^2 of pine BA on 117.33 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,239.83 ft^2 of pine BA on 229.79 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Construct Training Area Roads Project (PN 65554) will remove 314.35 ft^2 of pine BA on 13.36 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 288.37 ft^2 of pine BA on 8.70 acres (Table 6-7 and Figure 6-6). As a result of project impacts, 4.93 ft^2 of pine BA on 0.17 acre will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 1,406.60 ft^2 of pine BA on 43.28 acres of suitable habitat, 2,106.83 ft^2 of pine BA on 56.98 acres of potentially suitable habitat and 1,118.75 ft^2 of pine BA on 107.30 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 66.03% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,632.18 ft^2 of pine BA on 207.56 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster O10-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 14 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,369.23 ft^2 of pine BA on 72.26 acres of suitable habitat, 79.58 ft^2 of pine BA on 2.52 acres of potentially suitable habitat and 994.28 ft^2 of pine BA on 142.66 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,974.72 ft^2 of pine BA on 233.54 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 ST2 (PN 65383) will remove 39.85 ft^2 of pine BA on 1.32 acres. The ST2 construction limits will remove 55.08 ft^2 of pine BA on 1.82 acres. The 2009 Construct Training Area Roads Project (PN 65554) will remove 231.53 ft^2 of pine BA on 8.11 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,250.03 ft^2 of pine BA on 69.28 acres of suitable habitat, 13.26 ft^2 of pine BA on 0.42 acre of potentially suitable habitat and 853.34 ft^2 of pine BA on 136.49 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 62.88% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,648.26 ft^2 of pine BA on 222.29 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-14).

FB Cluster O10-03: This cluster had a PBG from 2005 to 2007 and was captured by O13-01 in 2004 and 2008 (Table 6-5). It contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 192.50 ft^2 of pine BA on 5.00 acres of suitable habitat, 3,666.92 ft^2 of pine BA on 106.93 acres of potentially suitable habitat and 539.68 ft^2 of pine BA on 28.66 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 120.15 ft^2 of pine BA on 2.67 acres of potentially suitable habitat and 4,278.95 ft^2 of pine BA on 137.92 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2009 Construct Training Area Roads Project (PN 65554) will remove 328.75 ft^2 of pine BA on 11.65 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 111.40 ft^2 of pine BA on 3.10 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 118.96 ft^2 of pine BA on 3.09 acres of suitable habitat, 3,375.69 ft^2 of pine BA on 98.33 acres of potentially suitable habitat and 464.30 ft^2 of pine BA on 24.42 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 52.82% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 120.15 ft^2 of pine BA on 2.67 acres of potentially suitable habitat and 3,838.80 ft^2 of pine BA on 123.17 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition may meet the RS in the future (Table 6-15).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster O10-04: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 9 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 4,657.54 ft^2 of pine BA on 139.26 acres of potentially suitable habitat and 79.67 ft^2 of pine BA on 25.05 acres of future potential habitat (Table 6-3). There was no suitable habitat.

The pre- project RS foraging habitat totals were 4,737.21 ft^2 of pine BA on 164.31 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Training Area Infrastructure-19D/K OSUT (PN 69741) will remove 114.27 ft^2 of pine BA on 3.43 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 382.56 ft^2 of pine BA on 14.13 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 4,160.71 ft^2 of pine BA on 124.76 acres of potentially suitable habitat and 79.67 ft^2 of pine BA on 21.99 acres of future potential habitat (Table 6-3). There was no suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 64.26% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,240.38 ft^2 of pine BA on 146.75 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition may meet the RS in the future (Table 6-15).

FB Cluster O11-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 15 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,376.17 ft^2 of pine BA on 57.56 acres of suitable habitat, 871.91 ft^2 of pine BA on 22.28 acres of potentially suitable habitat and 1,269.31 ft^2 of pine BA on 70.47 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,648.92 ft^2 of pine BA on 19.63 acres of suitable habitat, 607.36 ft^2 of pine BA on 9.11 acres of potentially suitable habitat and 3,740.38 ft^2 of pine BA on 134.78 acres of future potential habitat (Table 6-4).

Under the SMS, the 2009 Northern Training Area Infrastructure (PN 69742) will remove 222.46 ft^2 of pine BA on 13.63 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 3.08 ft^2 pine BA on 0.11 acre (Table 6-7 and Figure 6-6).

Under the RSG, the 2009 Northern Training Area Infrastructure (PN 69742) will remove 296.78 ft^2 of pine BA on 15.30 acres (Table 6-4 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 3.08 ft^2 pine BA on 0.11 acre (Table 6-4 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,231.63 ft^2 of pine BA on 54.18 acres of suitable habitat, 800.99 ft^2 of pine BA on 20.82 acres of potentially suitable habitat and 1,259.23 ft^2 of pine BA on 61.57 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 25.65% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,648.92 ft^2 of pine BA on 19.63 acres of suitable habitat, 542.02 ft^2 of pine BA on 8.13 acres of potentially suitable habitat and 3,505.86 ft^2 of pine BA on 120.35 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

FB Cluster O11-02R: This cluster was inactive from 2004 to 2007 but had a PBG in 2008 (Table 6-5). It contained 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,000.45 ft^2 of pine BA on 71.50 acres of suitable habitat and 269.54 ft^2 of pine BA on 19.83 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,231.20 ft^2 of pine BA on 25.65 acres of suitable habitat and 2,038.79 ft^2 of pine BA on 65.68 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Northern Training Area Infrastructure (PN 69742) will remove 593.01 ft^2 of pine BA on 14.93 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,437.02 ft^2 of pine BA on 57.73 acres of suitable habitat and 239.96 ft^2 of pine BA on 18.67 acres of future potential habitat. There was no potentially suitable habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 11.69% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,113.12 ft^2 of pine BA on 23.19 acres of suitable habitat and 1,563.86 ft^2 of pine BA on 53.21 acres of future potential habitat (Table 6-

4). There was no potentially suitable habitat. This partition will not meet the RS in the future (Table 6-14).

FB Cluster O12-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,599.74 ft^2 of pine BA on 70.50 acres of suitable habitat, 1,877.18 ft^2 of pine BA on 38.50 acres of potentially suitable habitat and 1,397.81 ft^2 of pine BA on 75.43 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 740.42 ft^2 of pine BA on 16.17 acres of suitable habitat, 982.87 ft^2 of pine BA on 14.78 acres of potentially suitable habitat and 4,151.44 ft^2 of pine BA on 153.48 acres of future potential habitat (Table 6-4).

The 2009 Tactical Training Base 19D/K OSUT (PN 69741) will remove 201.39 ft^2 of pine BA on 9.59 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,599.74 ft^2 of pine BA on 70.50 acres of suitable habitat, 1,877.18 ft^2 of pine BA on 38.50 acres of potentially suitable habitat and 1,196.42 ft^2 of pine BA on 65.84 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 36.15% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 740.42 ft^2 of pine BA on 16.17 acres of suitable habitat, 982.87 ft^2 of pine BA on 14.78 acres of potentially suitable habitat and 3,950.05 ft^2 of pine BA on 143.89 acres of future potential habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-12).

FB Cluster O13-01: This cluster had a PBG in 2004, 2006, 2007 and 2008; it was inactive in 2005 (Table 6-5). It had 12 cavity trees in various stages of completion and suitability

(Appendix G). The Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 1 cavity tree within 50 feet, 6 cavity trees within 51 to 200 feet and will remove 1 inactive insert tree and 1 inactive start tree. The Repair of Existing Training Roads (Phase 1) (PN 65557) will impact 1 cavity tree within 50 feet, 4 cavity trees within 51 to 200 feet and will remove 1 inactive start tree. Cavity tree #5176 is an inactive start that will be removed by both projects (Table 6-10).

The pre- project SMS foraging habitat totals were 919.27 ft^2 of pine BA on 23.88 acres of suitable habitat, 1,342.12 ft^2 of pine BA on 36.31 acres of potentially suitable habitat and 1,171.03 ft^2 of pine BA on 56.29 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,432.42 ft^2 of pine BA on 116.48 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Training Area Infrastructure-19D/K OSUT (PN 69741) will remove 733.31 ft^2 of pine BA on 25.54 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 116.41 ft^2 of pine BA on 6.81 acres (Table 6-7 and Figure 6-6). As a result of project impacts, 63.02 ft^2 of pine BA on 1.65 acre will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 746.52 ft^2 of pine BA on 19.39 acres of suitable habitat, 1,140.33 ft^2 of pine BA on 30.83 acres of potentially suitable habitat and 632.83 ft^2 of pine BA on 32.26 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 71.23% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,519.68 ft^2 of pine BA on 82.48 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

This cluster is currently monitored as a minimization effort for the DMPRC (FBCB, unpub. data).

FB Cluster O13-02: This cluster was inactive in 2004 but had a PBG from 2005 to 2008 (Table 6-5). There were 9 cavity trees in various stages of completion and suitability (Appendix G).

The Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 2 cavity trees within 50 feet, 3 cavity trees within 51 to 200 feet and remove 1 active insert cavity tree, 1 active start tree and 2 inactive cavity trees (Table 6-10). These impacts and removals will likely result in "take" of the cluster by harassment (Table 6-12).

The pre- project SMS foraging habitat totals were 3,369.72 ft^2 of pine BA on 84.27 acres of suitable habitat, 651.99 ft^2 of pine BA on 19.03 acres of potentially suitable habitat and 2,470.56 ft^2 of pine BA on 130.96 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 939.20 ft^2 of pine BA on 23.48 acres of suitable habitat and 5,553.07 ft^2 of pine BA on 210.78 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Training Area Infrastructure 19D/K OSUT (PN 69741) will remove 1,386.26 ft^2 of pine BA on 51.41 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,560.59 ft^2 of pine BA on 63.98 acres of suitable habitat, 636.58 ft^2 of pine BA on 18.57 acres of potentially suitable habitat and 1,908.84 ft^2 of pine BA on 100.30 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 40.76% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 844.80 ft^2 of pine BA on 21.12 acres of suitable habitat and 4,261.21 ft^2 of pine BA on 161.73 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster O13-06R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 10 cavity trees in various stages of completion and suitability (Appendix G). The Construction of Paved Training Area Roads (PN 65554) will impact 1 cavity tree within 50 feet and 1 cavity tree within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 2,636.57 ft^2 of pine BA on 70.05 acres of suitable habitat, 161.32 ft^2 of pine BA on 4.36 acres of potentially suitable habitat and 3,048.29 ft^2 of pine BA on 140.65 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,846.18 ft^2 of pine BA on 215.06 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Training Area Infrastructure 19D/K OSUT and Tank Trail Upgrades (PN 69741) will remove 110.22 ft^2 of pine BA on 5.78 acres. The 2009 Construct Training Area Roads Project (PN 65554) will remove 514.98 ft^2 of pine BA on 18.43 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,363.07 ft^2 of pine BA on 62.70 acres of suitable habitat, 161.32 ft^2 of pine BA on 4.36 acres of potentially suitable habitat and 2,696.59 ft^2 of pine BA on 123.79 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 61.38% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,220.98 ft^2 of pine BA on 190.85 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet RS in the future (Table 6-14).

FB Cluster O14-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 12 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 1 cavity tree within 51 to 200 feet and remove 2 inactive start trees (Table 6-10).

The pre- project SMS foraging habitat totals were 4,452.06 ft^2 of pine BA on 120.55 acres of suitable habitat and 2,736.86 ft^2 of pine BA on 128.37 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat

The pre- project RS foraging habitat totals were 2,145.27 ft^2 of pine BA on 60.43 acres of suitable habitat and 5,043.65 ft^2 of pine BA on 188.49 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Training Area Infrastructure 19D/K OSUT Tank Trail Upgrade (PN 69741) will remove 686.85 ft^2 of pine BA on 23.98 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 3,896.67 ft^2 of pine BA on 106.56 acres of suitable habitat and 2,605.40 ft^2 of pine BA on 118.38 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the

cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 18.05% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,075.33 ft^2 of pine BA on 58.46 acres of suitable habitat and 4,426.74 ft^2 of pine BA on 166.48 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster O14-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 14 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 1 cavity tree within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 1,856.92 ft^2 of pine BA on 35.71 acres of suitable habitat and 1,506.67 ft^2 of pine BA on 87.10 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 1,856.92 ft^2 of pine BA on 35.71 acres of potentially suitable habitat and 1,826.02 ft^2 of pine BA on 96.06 acres of future potential habitat (Table 6-4). There was no suitable habitat.

Under the SMS, the 2009 Training Area Infrastructure 19 D/K OSUT (PN 69741) will remove 757.92 ft^2 of pine BA on 25.84 acres (Table 6-6 and Figure 6-6).

Under the RSG, the 2009 Training Area Infrastructure 19 D/K OSUT (PN 69741) will remove 942.57 ft^2 of pine BA on 31.00 acres (Table 6-4 and Figure 6-6). As a result of project impacts, 134.70 ft^2 of pine BA on 3.80 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 1,351.48 ft^2 of pine BA on 25.99 acres of suitable habitat and 1,254.19 ft^2 of pine BA on 70.98 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 0.00% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,351.48 ft^2 of pine BA on 25.99 acres of potentially suitable habitat and 1,254.19 ft^2 of pine BA on 70.98 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster O14-03R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 6 cavity trees within 50 feet and 5 cavity trees within 51 to 200 feet. The Repair of Existing Training Roads (Phase 1) (PN 65557) will impact 1 cavity tree within 50 feet (Table 6-10). These impacts will likely result in "take" of the cluster by harassment (Table 6-12).

The pre- project SMS foraging habitat totals were 6,662.22 ft^2 of pine BA on 155.48 acres of suitable habitat and 960.12 ft^2 of pine BA on 88.73 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 2,172.93 ft^2 of pine BA on 49.20 acres of suitable habitat, 597.43 ft^2 of pine BA on 10.39 acres of potentially suitable habitat and 4,851.98 ft^2 of pine BA on 184.62 acres of future potential habitat (Table 6-4).

The 2009 Training Area Infrastructure 19D/K OSUT (PN 69741) will remove 2,143.60 ft^2 of pine BA on 66.35 acres (Table 6-6 and Figure 6-6). The 2010 Repair Existing Training Area Roads Project, Phase 1 (PN 65557) will remove 161.93 ft^2 of pine BA on 4.08 acres (Table 6-7 and Figure 6-6).

The post- project SMS foraging habitat totals were 4,688.67 ft^2 of pine BA on 109.05 acres of suitable habitat and 628.14 ft^2 of pine BA on 64.73 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 55.62% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,613.98 ft^2 of pine BA on 36.83 acres of suitable habitat, 380.08 ft^2 of pine BA on 6.61 acres of potentially suitable habitat and 3,322.75 ft^2 of pine BA on 130.34 acres of future potential habitat (Table 6-4). This partition can meet the RS in the future (Table 6-15).

This cluster was created on Fort Benning as compensation for the Incidental Take of Cluster N02-01 during the land exchange (see Sections 2.7.8 and 2.7.11) (JCA 2000).

FB Cluster O15-01: This cluster had a PBG from 2004 to 2008 (Table 6-5) and had 11 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 1 cavity tree within 50 feet and 5 cavity trees within 51 to 200 feet (Table 6-10).

The pre- project SMS foraging habitat totals were 1,209.95 ft^2 of pine BA on 33.21 acres of suitable habitat and 1,417.31 ft^2 of pine BA on 79.97 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 2,627.26 ft^2 of pine BA on 113.18 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Training Area Infrastructure 19 D/K OSUT (PN 69741) will remove 581.82 ft^2 pine BA on 28.24 acres. The 2009 Northern Training Area Infrastructure (PN 69742) will remove 21.13 ft^2 of pine BA on 1.07 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 994.00 ft^2 of pine BA on 27.04 acres of suitable habitat and 1,030.31 ft^2 of pine BA on 56.83 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 9.13% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,024.31 ft^2 of pine BA on 83.87 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster O15-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 7 cavity trees in various stages of completion and suitability (Appendix G). Construction of the Training Area Infrastructure (19D/K OSUT) (PN 69741) will impact 1 cavity tree within 50 feet and remove 1 inactive cavity tree (Table 6-10).

The pre- project SMS foraging habitat totals were 2,556.25 ft^2 of pine BA on 71.77 acres of suitable habitat and 1,810.29 ft^2 of pine BA on 71.88 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 4,366.54 ft^2 of pine BA on 143.65 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Training Area Infrastructure 19D/K OSUT (PN 69741) will remove 287.31 ft^2 pine BA on 9.84 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,369.41 ft^2 of pine BA on 66.54 acres of suitable habitat and 1,709.82 ft^2 of pine BA on 67.27 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 0.27% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,079.23 ft^2 of pine BA on 133.81 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition may meet the RS in the future (Table 6-14).

FB Cluster O15-03: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,506.61 ft^2 of pine BA on 67.91 acres of suitable habitat, 4.62 ft^2 of pine BA on 0.14 acre of potentially suitable habitat and 171.87 ft^2 of pine BA on 17.31 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 51.23 ft^2 of pine BA on 1.09 acres of suitable habitat and 2,631.87 ft^2 of pine BA on 84.27 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Training Area Infrastructure 19D/K OSUT (PN 69741) will remove 174.98 ft^2 pine BA on 4.79 acres. The 2009 Northern Training Area Infrastructure (PN 69742) will remove 148.43 ft^2 of pine BA on 4.60 acres (Table 6-6 and Figure 6-6).

The post- project SMS foraging habitat totals were 2,228.32 ft^2 of pine BA on 60.29 acres of suitable habitat, 4.62 ft^2 of pine BA on 0.14 acre of suitable habitat and 126.73 ft^2 of pine BA

on 15.54 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12 and Figure 6-12). Loblolly pine that is at high risk of decline accounts for 38.21% of the SMS post-project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 13.16 ft^2 of pine BA on 0.28 acre of suitable habitat and 2,346.51 ft^2 of pine BA on 75.69 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition cannot meet the RS in the future (Table 6-14).

FB Cluster Q02-02: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 11 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,369.62 ft^2 of pine BA on 62.88 acres of suitable habitat, 3,452.28 ft^2 of pine BA on 91.05 acres of potentially suitable habitat and 106.08 ft^2 of pine BA on 6.53 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,927.98 ft^2 of pine BA on 160.46 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 121.78 ft^2 of pine BA on 3.66 acres (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 2,326.88 ft^2 of pine BA on 61.77 acres of suitable habitat, 3,373.24 ft^2 of pine BA on 88.50 acres of potentially suitable habitat and 106.08 ft^2 of pine BA on 6.53 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 53.28% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 5,806.20 ft^2 of pine BA on 156.80 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster Q02-04R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,215.34 ft^2 of pine BA on 90.86 acres of suitable habitat, 2,023.83 ft^2 of pine BA on 45.58 acres of potentially suitable habitat and 108.60 ft^2 of pine BA on 79.50 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 5,347.77 ft^2 of pine BA on 215.94 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Good Hope Maneuver Heavy Use Area and Training Area Infrastructure (PN 69668) will remove 481.20 ft^2 of pine BA on 11.49 acres (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 3,124.62 ft^2 of pine BA on 88.70 acres of suitable habitat, 1,633.35 ft^2 of pine BA on 36.42 acres of potentially suitable habitat and 108.60 ft^2 of pine BA on 79.33 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 55.74% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 4,866.57 ft^2 of pine BA on 204.45 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster R02-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 6 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 3,588.13 ft^2 of pine BA on 89.70 acres of suitable habitat, 817.57 ft^2 of pine BA on 11.04 acres of potentially suitable habitat and 1,845.25 ft^2 of pine BA on 83.41 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,066.36 ft^2 of pine BA on 19.81 acres of suitable habitat, 926.72 ft^2 of pine BA on 15.25 acres of potentially suitable habitat and 4,257.87 ft^2 of pine BA on 149.09 acres of future potential habitat (Table 6-4).

The 2009 Access Road for the Tracked Vehicle Drivers Course (PN 64797) will remove 172.38 ft^2 of pine BA on 6.11 acres. The 2009 Construct Training Area Roads Project (PN

65554) will remove 179.73 ft^2 of pine BA on 4.87 acres. The 2009 Vehicle Recovery Course (PN 72017) will remove 774.94 ft^2 of pine BA on 21.21 acres. The 2009 Infrastructure Support - Utilities (PN 65554) will remove 189.16 ft^2 of pine BA on 3.91 acres (Table 6-6 and Figure 6-5). As a result of project impacts, 364.11 ft^2 of pine BA on 13.74 acres will be non-contiguous and cannot be counted towards the available foraging habitat for the partition (Table 6-3).

The post- project SMS foraging habitat totals were 2,720.17 ft^2 of pine BA on 64.91 acres of suitable habitat, 560.90 ft^2 of pine BA on 7.49 acres of potentially suitable habitat and 1,289.56 ft^2 of pine BA on 61.91 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 20.22% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 995.63 ft^2 of pine BA on 18.58 acres of suitable habitat, 560.90 ft^2 of pine BA on 7.49 acres of potentially suitable habitat and 3,014.10 ft^2 of pine BA on 108.24 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-15).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster S01-01: This cluster had a PBG from 2004 to 2008 (Table 6-5). It contained 8 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,535.58 ft^2 of pine BA on 66.61 acres of suitable habitat and 2,318.25 ft^2 of pine BA on 60.62 acres of potentially suitable habitat (Table 6-3). There was no future potential habitat.

The pre- project RS foraging habitat totals were 186.18 ft^2 of pine BA on 3.48 acres of suitable habitat and 4,667.65 ft^2 of pine BA on 123.75 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 33.24 ft^2 of pine BA on 0.80 acre (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 2,502.34 ft^2 of pine BA on 65.81 acres of suitable habitat and 2,318.25 ft^2 of pine BA on 60.62 acres of potentially suitable habitat

(Table 6-3). There was no future potential habitat. This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 33.41% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 177.62 ft^2 of pine BA on 3.32 acres of suitable habitat and 4,642.97 ft^2 of pine BA on 123.11 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition may meet the RS in the future (Table 6-15).

FB Cluster S02-01R: This cluster had a PBG from 2004 to 2008 (Table 6-5) and contained 13 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 5,794.52 ft^2 of pine BA on 117.81 acres of suitable habitat, 107.03 ft^2 of pine BA on 2.78 acres of potentially suitable habitat and 765.95 ft^2 of pine BA on 45.52 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 3,507.58 ft^2 of pine BA on 60.62 acres of suitable habitat and 3,159.92 ft^2 of pine BA on 105.49 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat.

The 2009 Good Hope MTA Range Access Road (PN 69358) will remove 286.32 ft^2 of pine BA on 6.80 acres. The 2009 Infrastructure Support - Utilities (PN 65554) will remove 13.86 ft^2 of pine BA on 0.99 acre (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 5,508.20 ft^2 of pine BA on 111.01 acres of suitable habitat, 107.03 ft^2 of pine BA on 2.78 acres of potentially suitable habitat and 752.09 ft^2 of pine BA on 44.53 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 35.21% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,507.58 ft^2 of pine BA on 60.62 acres of suitable habitat and 2,859.74 ft^2 of pine BA on 97.70 acres of future potential habitat (Table 6-4). There was no potentially suitable habitat. This partition can meet the RS in the future (Table 6-15).

FB Cluster S03-01R: This cluster was inactive from 2005 to 2006 and had a PBG from 2007 to 2008 (Table 6-5). It had 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 78.47 ft^2 of pine BA on 1.18 acre of suitable habitat, 1,698.15 ft^2 of pine BA on 44.96 acres of potentially suitable habitat and 2,649.28 ft^2 of pine BA on 100.03 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 78.47 ft^2 of pine BA on 1.18 acre of suitable habitat, 179.74 ft^2 of pine BA on 4.18 acres of potentially suitable habitat and 4,167.69 ft^2 of pine BA on 140.81 acres of future potential habitat (Table 6-4).

The 2009 Infrastructure Support - Utilities (PN 65554) will remove 51.60 ft^2 of pine BA on 1.20 acres (Table 6-6 and Figure 6-5). The 2010 Repair Existing Training Area Roads Project (PN 65557) will remove 124.28 ft^2 of pine BA on 4.02 acres (Table 6-7 and Figure 6-5).

The post- project SMS foraging habitat totals were 78.47 ft^2 of pine BA on 1.18 acre of suitable habitat, 1,606.99 ft^2 of pine BA on 42.84 acres of potentially suitable habitat and 2,564.56 ft^2 of pine BA on 96.93 acres of future potential habitat (Table 6-3). This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 33.37% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 78.47 ft^2 of pine BA on 1.18 acres of suitable habitat, 88.58 ft^2 of pine BA on 2.06 acres of potentially suitable habitat and 4,082.97 ft^2 of pine BA on 137.71 acres of future potential habitat (Table 6-4). This partition may meet the RS in the future (Table 6-14).

FB Cluster SHC-02: This cluster had a PBG from 2004 to 2006 and a solitary bird in 2007 and 2008 (Table 6-5). It had 7 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,106.07 ft^2 of pine BA on 26.49 acres of suitable habitat, 5,189.46 ft^2 of pine BA on 127.21 acres of potentially suitable habitat and 1,457.37 ft^2 of pine BA on 59.13 acres of future potential habitat (Table 6-3).

The pre- project RS foraging habitat totals were 1,564.34 ft^2 of pine BA on 36.38 acres of potentially suitable habitat and 6,188.56 ft^2 of pine BA on 176.45 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2010 Classrooms with Dual BN Dining Facilities (GTA) (PN 69150) will remove 17.85 ft^2 of pine BA on 0.60 acre. The 2010 Classrooms with BN Dining Facilities (GTA) (PN 70027) will remove 28.34 ft^2 of pine BA on 1.09 acres (Table 6-7 and Figure 6-5). The 2012 Sand Hill Recreation Centers (PN 65246) will remove 44.77 ft^2 of pine BA on 1.89 acres. The 2012 Training Barracks Complex (GTA) (PN 69745) will remove 2.21 ft^2 of pine BA on 0.07 acre (Table 6-9 and Figure 6-5).

The post- project SMS foraging habitat totals were 1,106.07 ft^2 of pine BA on 26.49 acres of suitable habitat, 5,173.06 ft^2 of pine BA on 126.69 acres of potentially suitable habitat and 1,380.60 ft^2 of pine BA on 56.00 acres of future potential habitat (Table 6-3). This cluster will not be taken at the cluster level due to loss of foraging habitat (Tables 6-3, 6-12 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 49.86% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 1,564.34 ft^2 of pine BA on 36.38 acres of potentially suitable habitat and 6,095.39 ft^2 of pine BA on 172.80 acres of future potential habitat (Table 6-4). There was no suitable habitat. This partition can meet the RS in the future (Table 6-15).

This partition will be taken at the group level due to the decrease in cluster density within 1.25 miles of its cluster center (Tables 6-12, 6-17 and Figure 6-11).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster T02-01: This cluster was inactive in 2004 and 2005, had a solitary male in 2006 and had a PBG in 2007 and 2008 (Table 6-5). It had 4 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 1,068.36 ft^2 of pine BA on 29.27 acres of suitable habitat and 3,004.79 ft^2 of pine BA on 145.33 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat.

The pre- project RS foraging habitat totals were 4,073.15 ft^2 of pine BA on 174.60 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat.

The 2009 Construct Training Area Roads Project (PN 65554) will remove 200.17 ft^2 of pine BA on 6.65 acres (Table 6-6 and Figure 6-5).

The post- project SMS foraging habitat totals were 883.30 ft^2 of pine BA on 24.20 acres of suitable habitat and 2,989.68 ft^2 of pine BA on 143.75 acres of future potential habitat (Table 6-3). There was no potentially suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and Figure 6-11). Loblolly pine that is at high risk of decline accounts for 96.45% of the SMS post- project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 3,872.98 ft^2 of pine BA on 167.95 acres of future potential habitat (Table 6-4). There was no suitable or potentially suitable habitat. This cluster can meet the RS in the future (Table 6-14).

This cluster was analyzed and "taken" by Transformation projects, but project impacts within this partition have been reanalyzed by MCOE Projects.

FB Cluster T02-02R: This cluster was captured by J02-02 in 2004 and had a PBG from 2005 to 2008 (Table 6-5). It had 9 cavity trees in various stages of completion and suitability (Appendix G). No cavity trees will be impacted or taken by Alternative A MCOE projects.

The pre- project SMS foraging habitat totals were 2,746.15 ft^2 of pine BA on 57.73 acres of potentially suitable habitat and 1,690.53 ft^2 of pine BA on 103.06 acres of future potential habitat (Table 6-3). There was no suitable habitat.

The pre- project RS foraging habitat totals were 2,494.80 ft^2 of pine BA on 50.40 acres of potentially suitable habitat and 1,941.88 ft^2 of pine BA on 110.39 acres of future potential habitat (Table 6-4). There was no suitable habitat.

The 2012 Rail Loading Facility Expansion (PN 62953) will remove 376.70 ft^2 of pine BA on 7.61 acres (Table 6-9 and Figure 6-5).

The post- project SMS foraging habitat totals were 2,369.45 ft^2 of pine BA on 50.12 acres of potentially suitable habitat and 1,690.53 ft^2 of pine BA on 103.06 acres of future potential habitat (Table 6-3). There was no suitable habitat. This cluster will be taken at the cluster level due to loss of foraging habitat and pre-project habitat deficiencies (Tables 6-3, 6-12, 6-13 and

Figure 6-11). Loblolly pine that is at high risk of decline accounts for 80.82% of the SMS post-project suitable and potentially suitable acreage (Table 6-16).

The post- project RS foraging habitat totals were 2,118.10 ft^2 of pine BA on 42.79 acres of potentially suitable habitat and 1,941.88 ft^2 of pine BA on 110.39 acres of future potential habitat (Table 6-4). There was no suitable habitat. This cluster can meet the RS in the future (Table 6-14).

6.8.5. GROUP LEVEL ANALYSES

The Group Level Analysis evaluates density effects to clusters directly impacted by proposed MCOE projects, but not "taken" at the cluster level. Eight clusters (A20-04, K11-02, K13-06, L02-02R, O07-01R, O07-03R, O09-02, and SHC-02) were considered "taken" due to project related group density reduction around the subject clusters (Tables 6-12 and 6-17).

A20-04. This cluster's group density will remain the same: 1 active cluster both pre- and post-project.

K11-02. This cluster's group density will be reduced from 2 active clusters to 1 cluster within 1.25 miles.

K13-06. This cluster's group density will be reduced from 3 active clusters to 1 cluster within 1.25 miles.

O07-01R. This cluster's group density remained the same: 1 active cluster both pre- and post-project.

O07-03R. This cluster's group density will be reduced from 2 active clusters to 1 cluster within 1.25 miles.

O09-02. This cluster's group density will be reduced from 4 active clusters to 1 cluster within 1.25 miles.

O12-02. This cluster's group density will be reduced from 4 active clusters to 1 cluster within 1.25 miles.

SHC -02. This cluster had 0 active clusters within 1.25 miles pre-project. Habitat between it and the nearest active cluster)U05-02) will become more fragmented as a result of cantonment area projects; therefore, it will be more at risk of cluster abandonment due to the proposed action.

Table 6-17. Pre- and post- project densities of red-cockaded woodpecker (RCW) clusters within 1.25 miles of clusters impacted by Alternative A (Preferred Alternative) MCOE projects, Fort Benning, Georgia.

	Pre- Project		Post- Project		Cluster Level Take (Y/N)	Group Level Take (Y/N)
Southern Ranges	# Active Clusters within 1.25 Miles	Density Rating	# Active Clusters within 1.25 Miles	Density Rating		
A17-01	14	dense	8	dense	Y	N/A
A17-02	11	dense	4	moderate	Y	N/A
A17-03	17	dense	11	dense	Y	N/A
A17-06	11	dense	4	moderate	Y	N/A
A17-08	12	dense	5	dense	Y	N/A
A17-11R	8	dense	1	sparse	Y	N/A
A17-12R	6	dense	1	sparse	Y	N/A
A17-13	16	dense	9	dense	Y	N/A
A17-14a	20	dense	14	dense	N	N
Average density =	**12.78**		**6.33**			
Cantonment						
A06-01	6	dense	4	moderate	N	N
A07-01	5	dense	4	moderate	Y	N/A
A08-01	11	dense	11	dense	N	N
A08-02a	8	dense	7	dense	N	N
A08-03	8	dense	8	dense	N	N
A08-04	7	dense	7	dense	N	N
A09-03R	6	dense	6	dense	N	N
A09-04R	7	dense	7	dense	N	N
A09-05	10	dense	10	dense	N	N
A20-04	1	sparse	1	sparse	N	Y
A20-06	8	dense	5	dense	N	N
BB03-01R	3	moderate	2	sparse	Y	N/A
BB04-01R	6	dense	3	moderate	N	N
BB05-01R	5	dense	3	moderate	N	N
C01-03	10	dense	9	dense	N	N
C01-06	9	dense	8	dense	N	N
HCC-08R	8	dense	6	dense	N	N
HCC-10R	6	dense	5	dense	Y	N/A
HCC-11R	7	dense	5	dense	Y	N/A

Density rating: ≥ 4.7 active clusters within 1.25 miles = dense
2.6 - 4.6 active clusters within 1.25 miles = moderate
≤ 2.5 active clusters within 1.25 miles = sparse

N/A = If subject cluster was "taken" at cluster level, it was not considered for "take" at group level.

Table 6-17 (cont.). Pre- and post- project densities of red-cockaded woodpecker (RCW) clusters within 1.25 miles of clusters impacted by MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

	Pre- Project		Post- Project		Cluster Level Take (Y/N)	Group Level Take (Y/N)
Cantonment (cont.)	# Active Clusters within 1.25 Miles	Density Rating	# Active Clusters within 1.25 Miles	Density Rating		
J01-02R	7	dense	5	dense	Y	N/A
J02-02R	9	dense	6	dense	Y	N/A
KPR-01	11	dense	11	dense	N	N
Q02-02	8	dense	8	dense	N	N
Q02-04R	4	moderate	4	moderate	N	N
R02-01R	5	dense	2	sparse	Y	N/A
S01-01	8	dense	6	dense	N	N
S02-01R	9	dense	6	dense	N	N
S03-01R	9	dense	8	dense	Y	N/A
SHC-02	0	N/A	0	N/A	N	Y
T02-01	12	dense	9	dense	Y	N/A
T02-02R	9	dense	6	dense	Y	N/A
Average density =	**7.16**		**5.87**			
Southern Maneuver Corridor						
D05-02R	7	dense	4	moderate	N	N
D05-04R	11	dense	9	dense	N	N
D06-01R	7	dense	4	moderate	Y	N/A
D08-01R	0	N/A	0	N/A	Y	N/A
D10-01	8	dense	2	sparse	Y	N/A
D11-01	10	dense	5	dense	Y	N/A
D11-02	10	dense	7	dense	Y	N/A
D12-01	11	dense	5	dense	N	N
D16-01	8	dense	3	moderate	Y	N/A
D16-02	6	dense	0	N/A	Y	N/A
D17-01	4	moderate	0	N/A	Y	N/A
D17-03	8	dense	2	sparse	Y	N/A
D17-04R	9	dense	3	moderate	Y	N/A
E02-01	14	dense	14	dense	N	N
E04-01	12	dense	10	dense	Y	N/A

Density rating: ≥ 4.7 active clusters within 1.25 miles = dense
2.6 - 4.6 active clusters within 1.25 miles = moderate
≤ 2.5 active clusters within 1.25 miles = sparse

N/A = If subject cluster was "taken" at cluster level, it was not considered for "take" at group level.

Table 6-17 (cont.). Pre- and post- project densities of red-cockaded woodpecker (RCW) clusters within 1.25 miles of clusters impacted by MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

	Pre- Project		Post- Project		Cluster Level Take (Y/N)	Group Level Take (Y/N)
Southern Maneuver Corridor (cont.)	# Active Clusters within 1.25 Miles	Density Rating	# Active Clusters within 1.25 Miles	Density Rating		
F02-01R	6	dense	5	dense	Y	N/A
J06-03	13	dense	10	dense	N	N
K21-02R	4	moderate	4	moderate	N	N
K21-05R	6	dense	5	dense	N	N
Average density =	**8.11**		**4.84**			
Northern Maneuver Corridor and Northern Ranges						
K02-01	5	dense	3	moderate	Y	N/A
L02-02R	2	sparse	1	sparse	Y	N/A
L03-01	2	sparse	1	sparse	Y	N/A
M01-01	9	dense	7	dense	Y	N/A
M08-01	4	moderate	3	moderate	Y	N/A
M08-02a	8	dense	5	dense	N	N
M08-02b	7	dense	6	dense	Y	N/A
M08-04R	9	dense	7	dense	N	N
M08-05R	11	dense	6	dense	N	N
N01-02	4	moderate	4	moderate	N	N
O01-01	12	dense	6	dense	N	N
O01-02	10	dense	6	dense	Y	N/A
O01-03	10	dense	6	dense	N	N
O01-04R	11	dense	6	dense	N	N
O02-01R	10	dense	8	dense	N	N
O03-01	10	dense	7	dense	Y	N/A
O03-02	8	dense	6	dense	N	N
O03-03	10	dense	4	moderate	Y	N/A
O03-04	14	dense	7	dense	Y	N/A
O03-05	9	dense	8	dense	N	N
O03-06R	10	dense	5	dense	N	N
O03-07	10	dense	5	dense	N	N
O04-01	9	dense	5	dense	Y	N/A

Density rating: ≥ 4.7 active clusters within 1.25 miles = dense

2.6 - 4.6 active clusters within 1.25 miles = moderate

≤ 2.5 active clusters within 1.25 miles = sparse

N/A = If subject cluster was "taken" at cluster level, it was not considered for "take" at group level.

Table 6-17 (cont.). Pre- and post- project densities of red-cockaded woodpecker (RCW) clusters within 1.25 miles of clusters impacted by MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Northern Maneuver Corridor and Northern Ranges (cont.)	Pre- Project		Post- Project		Cluster Level Take (Y/N)	Group Level Take (Y/N)
	# Active Clusters within 1.25 Miles	Density Rating	# Active Clusters within 1.25 Miles	Density Rating		
O04-03a	10	dense	5	dense	Y	N/A
O04-03b	10	dense	5	dense	Y	N/A
O05-01	5	dense	4	moderate	N	N
O05-02	8	dense	6	dense	Y	N/A
O05-03R	7	dense	4	moderate	N	N
O07-01R	1	sparse	1	sparse	N	Y
O07-03R	2	sparse	1	sparse	N	Y
O08-01	3	moderate	2	sparse	Y	N/A
O08-02	4	moderate	1	sparse	Y	N/A
O09-02	4	moderate	1	sparse	N	Y
O10-01	8	dense	4	moderate	N	N
O10-02	8	dense	5	dense	Y	N/A
O10-03	6	dense	3	moderate	N	N
O10-04	9	dense	4	moderate	N	N
O11-01	10	dense	3	moderate	N	N
O11-02R	13	dense	7	dense	Y	N/A
O12-02	4	moderate	1	sparse	N	Y
O13-01	6	dense	4	moderate	Y	N/A
O13-02	9	dense	4	moderate	Y	N/A
O13-06R	6	dense	4	moderate	Y	N/A
O14-01	10	dense	4	moderate	N	N
O14-02	7	dense	3	moderate	Y	N/A
O14-03R	8	dense	4	moderate	Y	N/A
O15-01	11	dense	5	dense	Y	N/A
O15-02	10	dense	4	moderate	Y	N/A
O15-03	11	dense	6	dense	Y	N/A
Average density =	**7.84**		**4.43**			

Density rating: ≥ 4.7 active clusters within 1.25 miles = dense

2.6 - 4.6 active clusters within 1.25 miles = moderate

≤ 2.5 active clusters within 1.25 miles = sparse

N/A = If subject cluster was "taken" at cluster level, it was not considered for "take" at group level.

Table 6-17 (cont.). Pre- and post- project densities of red-cockaded woodpecker (RCW) clusters within 1.25 miles of clusters impacted by MCOE projects, Alternative A (Preferred Alternative), Fort Benning, Georgia.

Multipurpose Training Range and Associated Roads	Pre- Project		Post- Project		Cluster Level Take (Y/N)	Group Level Take (Y/N)
	# Active Clusters within 1.25 Miles	Density Rating	# Active Clusters within 1.25 Miles	Density Rating		
K08-03	7	dense	6	dense	N	N
K08-04	8	dense	7	dense	N	N
K09-01	9	dense	7	dense	N	N
K09-02R	7	dense	5	dense	N	N
K09-03R	4	moderate	3	moderate	N	N
K11-02	2	sparse	1	sparse	N	Y
K11-04R	3	moderate	3	moderate	Y	N/A
K12-01	1	sparse	1	sparse	Y	N/A
K13-02	8	dense	6	dense	Y	N/A
K13-04	5	dense	3	moderate	Y	N/A
K13-05R	9	dense	7	dense	Y	N/A
K13-06	3	moderate	1	sparse	N	Y
Average density =	**5.08**		**3.85**			

Density rating: ≥ 4.7 active clusters within 1.25 miles = dense

2.6 - 4.6 active clusters within 1.25 miles = moderate

≤ 2.5 active clusters within 1.25 miles = sparse

N/A = If subject cluster was "taken" at cluster level, it was not considered for "take" at group level.

6.8.6. NEIGHBORHOOD LEVEL ANALYSES

The neighborhood level analysis evaluates indirect group density impacts to clusters not directly impacted by Alternative A MCOE projects, but within a 2.57 mile radius "Neighborhood" (see Section 5.5). Nine clusters (D11-03R, J01-01, J01-03R, K10-01R, K11-03, K14-01R, O04-02, O06-03R, O06-04R) were considered adversely affected to such an extent that "take" is likely due to project-related neighborhood level impacts (Table 6-12 and Figure 6-16).

6.8.7. POPULATION LEVEL ANALYSIS

The population level analysis considers the ability of Fort Benning to meet its RCW population goal (351 PBGs in 421 total managed clusters) post-project.

6.8.7.1. RCW Impacts

Based on USFWS impact analysis guidance (USFWS 2005), 78 of the 120 analyzed active RCW clusters (65%) are likely to be "taken" by the proposed action under Alternative A as a result of foraging habitat loss only (41), foraging habitat loss and cavity tree removal (14), cavity tree removal only (1), harassment (5), group level impacts (8) and/ or neighborhood level impacts (9) (Table 6-11). Seventy-five of these 78 "taken" clusters (96%) were inhabited by PBGs in 2008, therefore the proposed action could reduce the number of PBGs from 271 to 196.

In addition, 8 impacted (but not "taken") clusters will have less than 120 acres of manageable habitat and will be unable to meet the RS in the future (Table 6-15). Eighteen other impacted clusters will have between 120 and 150 acres of habitat and may or may not be able to meet the RS depending on local site conditions and management regime (Tables 6-13 and 6-14).

There were 32 clusters included in the Incidental Take Statement in the Transformation Biological Opinion (USFWS 2007a). Due to project redesigns, impacts to 22 of those clusters "taken" by Transformation projects were reanalyzed in this Biological Assessment. Transformation projects resulting in 10 "takes" were not reanalyzed and these "takes" must be added to the total impacts from this MCOE action (78 "takes") 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 the proposed MCOE actions is 88.

Dudded Impact Area Clusters. RCW clusters in the forested, dudded impact areas which are not accessible for management cannot be counted toward the Installation recovery goal (DA 1996, 2007). However, it is generally recognized that such areas, particularly the A20 Impact Area, are populated by RCW groups and provide important foraging and dispersal habitat, as well as being a source of juvenile RCWs. Therefore, introduced or increased impacts to habitat in these areas could directly and indirectly impact the overall health and stability of the Fort Benning RCW population. The beaten area for the proposed MPMG2 range will result in the loss of cavity trees and foraging habitat in the following unmanaged clusters, based on current available data: A20-17 (4 of 4 cavity trees), A20-19 (6 of 10 cavity trees), A20-20 (8 of 8 cavity trees), A20-21 (6 of 6 cavity trees), A20-22 (1 of 1 cavity tree) and A20-43 (4 of 15 cavity trees). Up to 260.25 acres of foraging habitat within the A20 (based on stand data provided by FBLMB) will be lost as a result of the beaten area associated with this range. The 6 previously listed clusters are the subject of an Incidental Take Statement from the ESMP BO (USFWS 2002).

6.8.7.2. Habitat Loss and Fragmentation

As described in Sections 5.5 and 5.6, research has shown that the more aggregated RCW clusters are, the higher the probability of persistence, even with considerable foraging habitat loss (Hooper and Lennartz 1995). Therefore, the area with the greatest aggregation of clusters would be considered to be the most stable. Pre-project, these areas on Fort Benning are in and around the A20 Impact Area in the southwest, northeast of Ochillee Creek around Hourglass Road in the center of the Installation and in the Oscar compartments in the northwestern corner of the Installation (Figure 6-17). Under Alternative A, there may be substantial reductions in cluster density around the Oscar Small Arms Complex, around the A20 Impact Area, in the Northern Maneuver Area and in the Southern Maneuver Area. There will still be densely aggregated clusters post-project along Ochillee Creek, although density will be reduced. Maintaining areas with high cluster density will be crucial to ensure that the RCW population remains stable enough to survive and, ideally, reach recovery.

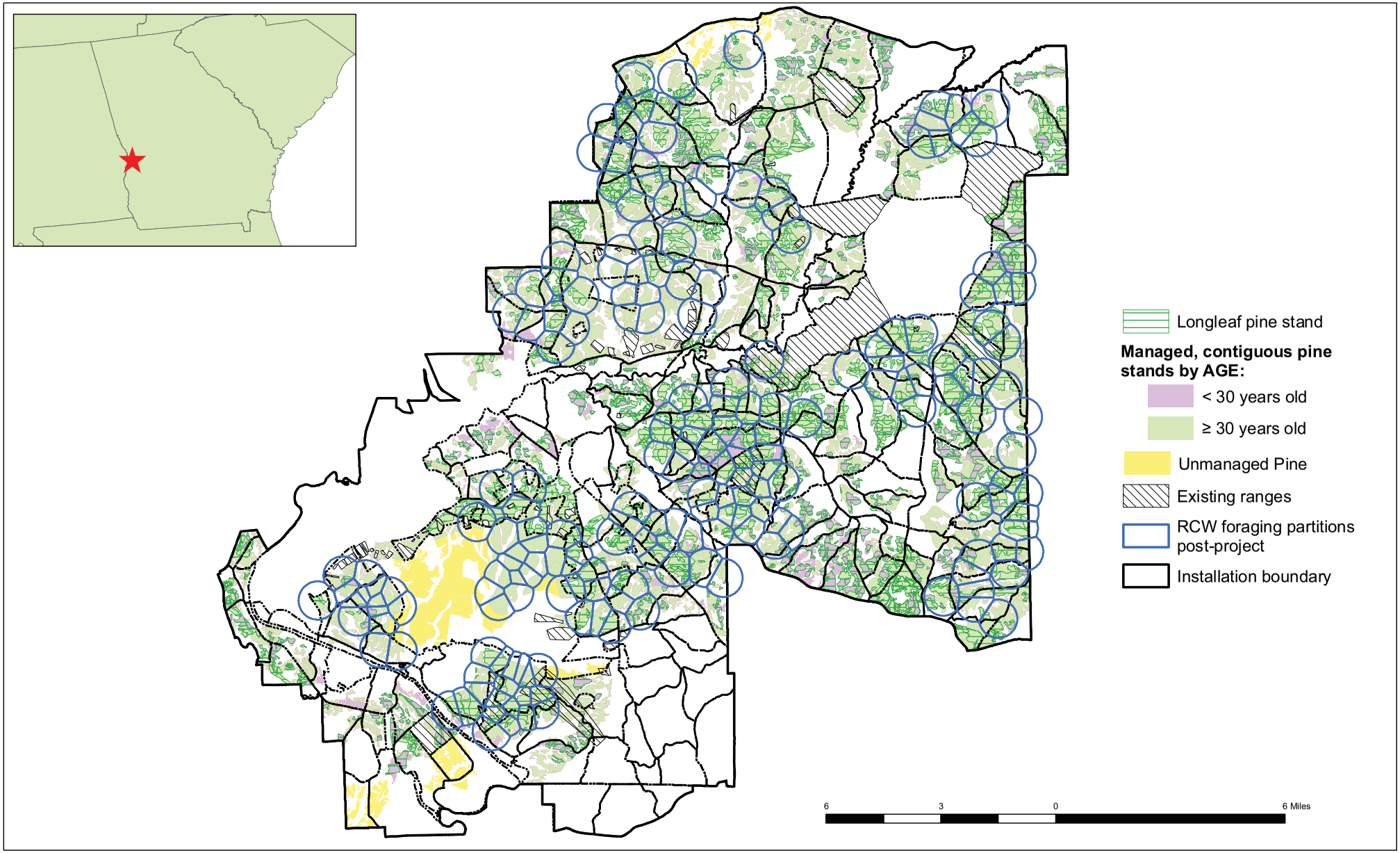


Figure 6-17. Red-cockaded woodpecker (RCW) partitions remaining post-project for Alternative A (Preferred Alternative) and contiguous pine and pine-hardwood stands (potential RCW foraging habitat) by age and species, Fort Benning.

As described in Section 6.8.3.6, home range follows and radio telemetry studies have indicated that female RCWs of any age are reluctant to cross openings 492 - 2,132 ft. (0.11 mi.), and will not cross openings of >2,132 ft. (0.49 mi.) (J. Walters, VA Polytechnic Institute, pers. comm.). The proposed action will create several large openings, the largest being the MPMG2 range (±482.73 acres (including forested habitat within the A20 Impact Area), averaging 1.23 by 1.56 mi.), ST2 (±562.63 acres, averaging 1.97 by 1.38 mi.), MPTR (±875.88 acres, averaging 0.97 by 3.30 mi.) and the Southern Maneuver Area (±3,035.86 acres, 4.39 by 1.47 mi.) (Table 4-1). While these openings will be substantial and RCWs (females in particular) are unlikely to cross them directly on a regular basis, sufficient dispersal corridors may remain so that adjoining habitats will not be permanently isolated as a result of the proposed action. The demographic model being utilized for this action will assess habitat contiguity (Section 8.3.4).

Cluster SHC-02 (active during nesting season 2008), as well as the remaining habitat in the Sand Hill area, is currently somewhat isolated and will become more so with the proposed action. As young pine plantations mature, this area could feasibly become contiguous habitat and count towards the needed recovery acreage. This habitat, however, is already a challenge for management due to its proximity to barracks and other buildings on Post, as well as a large, dense residential development just off-Post in Columbus. Currently, there are only a few weeks a year when the area is vacant and FBLMB is allowed to burn. With the amount of development proposed in Sand Hill, this area may never contribute to RCW recovery.

Stands in the proposed Good Hope Maneuver Area are currently too young to provide a dispersal corridor between clusters south of the A20 Impact Area with clusters east of the Impact Area and US Hwy. 27-280. The Impact Area currently provides the most valuable link between RCWs to the south and west with the remainder of the Fort Benning population, however approximately 260 acres of it will be impacted by the proposed MPMG2 range. As discussed in Section 6.8.2.1, several cooperating agencies have a mutual interest in preserving potential RCW habitat between Fort Benning and Enon and Sehoy Plantations (Figure 6-3). Clearing for the MPMG2 range will reduce the likelihood of RCWs successfully dispersing to the west. Retention of the remaining active clusters south and west of the A20 Impact Area will be crucial in order to eventually establish a viable subpopulation in the AL portion of the Installation.

Clusters in the southeastern corner of the Installation (e.g., Compartments H1, G5 and/ or F4) are also somewhat isolated from clusters to the west by large, young pine plantations.

Maneuver training in the proposed Southern Maneuver Area is not expected to worsen this situation. In time, the young plantations can serve as a dispersal corridor to link these clusters with clusters to the west.

There are 3 groups of clusters that will become vulnerable to demographic stochasticity resulting from habitat loss, reduction of cluster density and isolation from the proposed action: a group of 8 clusters in the northeastern corner of the Installation, a group of 15 clusters west of the A20 Impact Area and a group of 20 clusters south of the A20 Impact Area (Figures 6-16). Research on small populations suggests that a minimum of 10 clusters, maximally aggregated, is necessary to keep small populations demographically viable (Crowder et al. 1998, Walters et al. 2002a). Based on this research, the 2 groups of isolated clusters in the southwest may persist over time. In addition, it is possible that habitat management and pine planting around the existing IPBC range can connect the southernmost clusters with the active RCW clusters in Harmony Church in the future. If the existing forested habitat within the A20 Impact Area can be counted and managed towards the total available pine habitat on Fort Benning, it could also serve to connect both groups of isolated clusters south and west of the A20 to Harmony Church (see Section 9.10). The 8 clusters in the northeast may become unstable or inactive over time due to isolation and their location beyond the average RCW dispersal distance (2.57 miles) from active RCW clusters not adversely affected by the proposed action. Post-MCOE, the nearest active cluster will be 3.4 miles away (Cluster K09-02R to K17-05R). It will be difficult to reestablish a link between these clusters and the remainder of the population because of their location between Upatoi and Kings Mill Creeks, the K15 Impact Area, the DMPRC, the Installation boundary (on 2 sides), and habitat removed for the MPTR. This could result in permanent isolation of 3,089 acres of habitat.

Depending on the location of properties that become available, long-term, off-post habitat conservation proposed in Section 8.6 could reduce this risk by adding potential habitat adjacent to the eastern and northern boundaries of the Installation. This could increase the number of clusters that could be supported in this area at recovery, thereby increasing the likelihood of persistence of clusters in this area.

6.8.7.3. Population Recovery and Habitat Restoration

With impacted inactive clusters taken out and including clusters that are currently included in an Incidental Take Statement but have >120 acres of pine habitat, 99 partitions (4 inactive) will contain <120 acres of pine habitat, 47 (0 inactive) will contain 120-150 acres of habitat and 137 (11 inactive) partitions will contain ≥150 acres of pine habitat post-project; therefore, at a minimum, there will be 136 clusters post-MCOE that will have ≥150 acres of contiguous, managed pine habitat post-MCOE (32.3% of the approximately 421 clusters needed for recovery). Note: this number does not include inactive clusters that were disregarded for the foraging habitat analyses (Section 5.2.1.2); it is possible that some of these clusters could have ≥150 acres of pine habitat (Tables 6-14, 6-15 and 6-18).

Post-Transformation there were a total of 74,044 acres of contiguous pine habitat on Fort Benning (Table 6-19 and Figure 6-17). The proposed action will result in the loss of up to 12,901 acres of pine across the Installation, not all of which would be potential RCW habitat.

Approximately 74,044 acres of pine stands will remain post-MCOE, of which 66,392 acres are potentially contiguous pine habitat that can be managed for RCWs. This total includes all available pine habitat, regardless of its current condition. Approximately 19,915 acres (30.0% of 66,392 acres) are forested in loblolly or shortleaf pine stands that are at high risk of pine decline (Figure 3-12). Of the 66,392 acres of contiguous, managed pine remaining post-project, 11,865 acres are under 30 years old. Of this amount, 9,808 acres are longleaf-dominated (Figure 6-17). As discussed above, 3,089 acres of habitat and 8 clusters in the northeastern corner of the Installation may be permanently isolated.

Based on average percentages of clusters inhabited by PBGs or solitary males and those clusters that are captured by a neighboring RCW group or inactive, Fort Benning currently needs to manage 421 clusters in order to have 351 PBGs and reach its Recovery Goal. However, the total number of clusters needed may increase if part of the RCW population becomes permanently isolated due to habitat fragmentation and/ or there is a decrease in the proportion of clusters inhabited by PBGs.

Table 6-18. Ability of red-cockaded woodpecker (RCW) clusters **NOT impacted** by Alternative A (Preferred Alternative) Maneuver Center of Excellence projects to meet the Recovery Standard (RS) (USFWS 2003a) in the future, Fort Benning, Georgia.

Cannot Meet RS (< 120 Acres of Manageable Habitat)		May Not Meet RS (121-149 Acres of Manageable Habitat)	Can meet RS (≥ 150 Acres of Manageable Habitat)		
A01-01a	E07-01b	A04-01	A01-02[1]	J04-01	T03-04R
A01-03	E07-03	A09-02R	A01-08	J05-01	T04-01
A01-04	E07-07	A15-04	A02-02	J05-03[1]	T05-01
A01-05[1]	E07-08	A15-05	A06-02R	J06-02R[1]	T05-02
A01-06	E08-02	A18-01	A07-02	K08-02	U01-01
A01-07	F04-04	A20-32	A13-01	K11-03[2]	U01-02
A03-01R[1]	F05-02R	A20-34	A15-10	K13-01	U02-01R
A04-02	G05-02	D03-01	A15-13	K14-01R[2]	U03-01R[1]
A04-03[1]	H01-02R	D11-03R[2]	A15-15	K17-01	U03-02R
A08-02b	J01-03R[2]	E05-03	A17-04	K17-02	U05-01
A14-03R	K08-01	E07-02	A18-02	K17-03	U05-02
A15-02	K10-01R[2]	E07-05	A20-05	K17-04	
A15-03	K21-01R	E07-06	A20-26	K17-05R	
A15-07	M06-03	F05-01	A20-40	K18-01	
A15-08	M06-04	G05-03R	C01-02	K18-02R	
A15-09e	M06-05	J01-01[2]	C02-01R	K18-03R	
A15-09w	M06-13R	M06-07	C02-02	K20-01R[1]	
A16-01	O15-04	M06-08	C02-04R[1]	K20-02R	
A16-02	T01-03	N02-02	D05-01R	K20-03R[1]	
A17-05	T03-01	T01-01	D15-01R[3]	K21-04R[1]	
A17-07	T04-03R	T01-02	E03-01	K22-01	
A17-14b		T01-06	E03-02	K22-03[3]	
A20-27			E05-05	M02-01	
A20-29			E08-03R	M06-01	
A20-35			E08-04R	M06-02	
A20-36			E08-05R	M06-06a	
A20-37			F04-01R[1]	M06-06b	
A20-38			F04-02R	M06-10R	
A20-39			F04-05R	M06-12R	
C01-04			G05-01	O04-02[2]	
C01-05			G05-04R	O06-01[1]	
C03-02[1]			G06-01R	O06-03R[2]	
D04-01R			G06-02R	O06-04R[2]	
D05-03R			G07-01R[1]	O12-03R	
E05-02			H03-01	Q02-03	
E07-01a			J03-01	T03-02	
53 Active, 4 Inactive		**22 Active Clusters**	**72 Active, 11 Inactive**		

[1]Cluster is inactive.

[2]Cluster is expected to be "taken" indirectly at the neighborhood level by the proposed MCOE actions.

[3]Cluster was "taken" by the Digital Mutipurpose Range Complex (USFWS 2004).

Table 6-19. Removals and remaining acreage of all contiguous pine and pine-hardwood habitat (potential RCW habitat, current and future), Maneuver Center of Excellence, Fort Benning, Georgia.

Pine and pine- hardwood habitat removals and post-project totals:	
	Alternative A (Acres)
Pre-project Forested Pine Habitat[1]	86,945
Total Foraging Habitat Removal	12,901
Post-project Forested Pine Habitat	74,044
TOTAL POST- PROJECT CONTIGUOUS HABITAT[2]	**66,392**
Average acres/ 421 clusters	**158 acres/ cluster**

[1] Includes only Transformation projects not being reanalyzed.

[2] Total could increase as Fort Benning identifies hardwood-dominated stands to convert to longleaf pine.

At recovery, partitions are expected to contain a minimum of 120 acres of good quality foraging habitat meeting all of the Recovery Standard criteria listed in Section 5.4.3 (USFWS 2003a). While it may be possible for 100% of the habitat within some partitions to meet the Recovery Standard (thereby requiring only 120 total acres of pine habitat), it is more likely that, even using single-tree selection and uneven-aged management, some percentage of the pine stands in each partition will be in various stages of succession; in poor health; damaged from fire, weather, or training; or will need to be cleared for projects or military training.

Therefore, in order to help ensure sufficient habitat for 421 clusters, 150 acres per partition was used to allow a "buffer" for future project removals or loss of stands due to disease or wildfire. This decision was supported by the definitive foraging habitat and fitness study for Sandhills RCWs (conducted in NC), which found that the average home range size in the best quality habitat was nearly 200 acres (Walters et al. 2002a). The 120 acre foraging habitat minimum acreage in the RS (USFWS 2003a) is based on contiguous suitable habitat growing on high quality sites. These conditions do not currently exist on Fort Benning and may never be achieved there at a landscape level. Data from home range follows conducted for 11 RCW groups around the DMPRC from December 2004 through March 2008 have revealed home ranges (fixed kernel density) between 113 and 326 acres, with a mean home range size of 193 acres (J. Neufeldt, Fort Benning, pers. comm.). These clusters could require a larger home range because of low-quality habitat: the average acreage of suitable + potentially suitable habitat within these partitions is 95 acres, and the mean is 89 acres (M. Barron, unpub. data).

Using the allocation of 150 acres/cluster, Fort Benning will need 63,150 acres of contiguous longleaf habitat for recovery. The pine habitat remaining post-project (66,392) (Table 6-19) could potentially support 421 clusters at 158 acres/ cluster, or 443 clusters at 150 acres/ cluster, which would be sufficient to meet recovery in the future depending on the spatial configuration of the remaining habitat and the distribution of RCWs on the landscape (but not considering habitat and population losses attributed to pine decline, future project removals/impacts or losses due to training impacts). If the loss (isolation) of habitat due to the MPTR is never recovered, the contiguous acreage remaining post-project (63,303) would support 422 clusters with 150 acres each, slightly above the number of clusters Fort Benning must manage to meet its Recovery Goal.

Fort Benning is in the process of identifying upland hardwood-pine stands for conversion to longleaf pine. This conversion could potentially add to the total acres of pine on the Installation. Research currently being conducted on underplanting longleaf in loblolly pine stands, forest decline and pre-colonial stand composition at Fort Benning (Section 8) will provide valuable information in determining the best treatment methods to use in order to maintain the maximum amount of RCW habitat while successfully regenerating stands to longleaf pine.

6.8.7.4. Survival and Population Viability

Post-project, there will be approximately 196 clusters inhabited by PBGs (based on 2008 nesting data). Of the 5 main threats to population viability discussed in Section 6.8.1, this number is considered to be large enough to withstand threats of demographic stochasticity and inbreeding depression, however, only populations with ≥250 PBGs are considered to be robust to environmental stochasticity (USFWS 2003a; DA 2007). Retaining genetic variability despite genetic drift could require 350-1000 PBGs (USFWS 2003a), however, as described in Section 6.8.2, this risk can be alleviated by the introduction (via translocation or natural dispersal) of 1-10 migrants per generation (0.25 to 2.5 migrants per year). The Fort Benning population will be no more or less likely to experience a catastrophe such as a hurricane because of the proposed action, however the introduction of large openings such as the MPMG and MPTR proposed could cause stands to be more susceptible to wind damage (Section 6.8.3.6). Since the majority of the direct effects of hurricanes cannot be avoided, one of the only tools managers have to address the hurricane threat is response after the event. The proposed action should not affect Fort Benning's ability to respond to catastrophes (e.g., reconnaissance and installation of cavities). Stressed trees are more prone to disease and pests, so it is feasible that disturbance caused by the proposed action could cause Fort Benning to be slightly more prone to disease and pest outbreaks.

The demographic model described in Section 8.3.4 will help to assess population viability.

6.8.8. RECOVERY UNIT ANALYSIS (JEOPARDY ANALYSIS)

In jeopardy analyses, a species' likelihood of both survival and recovery must be considered (USFWS and NMFS 1998). With RCWs, this determination is made at the Recovery Unit Level (USFWS 2003a). Recovery is defined as "improvement in the status of a listed species to the point at which listing is no longer appropriate under the criteria set out in Section 4(a)(1) of the Act." Survival can be defined as "the condition in which a species continues to exist into the future while retaining the potential for recovery" (USFWS and NMFS 1998).

As discussed above, analyses at the cluster, group, neighborhood and population levels suggest that Fort Benning may be able to ultimately support a Primary Core Recovery Population (350 PBGs), thereby achieving the role prescribed for it in the species' Recovery Plan (USFWS 2003a). The proposed action (either alternative) is certain to delay recovery of the Fort Benning RCW population as outlined in the RCW Recovery Plan (USFWS 2003a).

While Fort Benning is geographically within the Sandhills Recovery Unit, the closest RCW recovery populations to Fort Benning are the Piedmont/ Oconee Secondary Core Population (Piedmont Recovery Unit), Talladega/ Shoal Creek Essential Support Population (Cumberlands/ Ridge and Valley Recovery Unit) and the J.W. Jones Ecological Research Center Significant Support Population (East Gulf Coastal Plain Recovery Unit) (Figure 6- 3). A demographic link between Fort Benning and the next closest population in the Sandhills Recovery Unit (Fort Gordon) would require first forming a link with the Piedmont/ Oconee population. For this reason, while Fort Benning's role in the Sandhills Recovery Unit should be the primary focus of the Recovery Unit analysis, attention must also be paid to Fort Benning's role in relation to other populations in other Recovery Units as well.

USFWS will determine if the impacts described in this Biological Assessment will affect the Sandhills Recovery Unit's ability to survive and recover in the BO for this action.

6.8.9. BIOLOGICAL DETERMINATION

May Affect, Likely to Adversely Affect

7. CUMULATIVE EFFECTS

Cumulative effects are defined in the USFWS Consultation Handbook to "include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area" (USFWS and NMFS 1998). Since most future Federal actions will at some point be subject to the Section 7 consultation process, their effects on a particular species will be considered at that time and are not included in the cumulative effects analysis (*Federal Register*, 50 CFR 402.02).

Off-post developments meeting the above-listed criteria that are expected to occur within the Action Area are listed below.

- ***Development of the MTP (Ongoing).*** Most of the 2,124 acre MTP, located adjacent to Compartments N1, O5 and O2 on Fort Benning, is undeveloped at this time although several parcels are available for purchase and development. The most recent sale was to Cessna Corporation, which has almost completed its construction on a parcel in the northeastern corner of the MTP technology park. Much of the pine habitat on the MTP was cleared in 2005 and 2007 (JCA 2008a).

  While RCWs from Fort Benning and the "taken" Cluster N2-1 on City property may utilize the MTP for foraging habitat, development of the tract has been, and will continue to be, within the constraints of the Land Exchange BO (USFWS 1998), Restrictive Covenants (US Army and the Consolidated Government of Columbus 1999) and other legally-binding documents (see Sections 2.3.8, 3.2 and 6.8.2.2). Further development of the MTP will therefore not have an effect on the Ft. Benning RCW population that has not already been accounted for in a USFWS BO.

- ***General urban growth (throughout the Action Area)***. Growth associated with the Columbus Metropolitan Area has been robust in recent years and is expected to continue. The Army and Fort Benning have been working with the community to plan development near the Installation. The efforts have had some positive results, for example, the ACUB program (described in Section 8). Cumulative effects of the general urban growth are difficult to quantify because of the number of small projects in the Action Area.

Suburban development has the most potential to impact listed species directly and indirectly. Development of lands on or near Uchee Creek in AL could affect the designated shiny-rayed pocketbook Critical Habitat. The Army, TNC and other organizations have a common interest in preserving undeveloped land around the Installation in order to increase the long-term stability of the Fort Benning RCW Primary Core Population. As development pressure increases around the Installation, the economic feasibility of preserving large tracts of land will decrease. To counteract this potential indirect effect, the Army plans to accelerate its ACUB program substantially (described in Section 8.6).

- ***Oxbow Project.*** The Oxbow Meadows Environmental Learning Center is located off Lumpkin Road in Columbus, GA. The Center has proposed improvements including creation of additional outdoor classrooms, a series of walking and hiking trails, a pavilion and construction (to include dredging and fill) of a 350-slip capacity marina on the Chattahoochee River. The overall project size is approximately 10 to 15 acres (Fort Benning 2005b). Development of a hotel and conference center has also been proposed in this area (Jones 2006).

  This project is located near the confluence of Upatoi Creek and the Chattahoochee River and should have no effect on Uchee Creek, which is designated Critical Habitat for the shiny-rayed pocketbook.

- ***Chattahoochee River Restoration.*** In order to restore the historic and natural course of the Chattahoochee River from just north of the City of Columbus to its southernmost edge, the Eagle-Phenix Dam and City Mills Dam will be breeched. The desired outcome is to increase Fall Line shoal fish habitat and recreation (Eubanks and Buckalew 2005). The size of the project is approximately 2.5 river miles and 35 acres.

  This project could, at least temporarily, affect water levels where Uchee Creek (designated shiny-rayed pocketbook Critical Habitat) meets the Chattahoochee, however, areas downstream of Columbus are already subject to regular changes in water levels from the dams mentioned above.

- ***Tri-State Water Disputes.*** For more than a decade, the states of GA, AL and FL have been in dispute regarding the withdrawal and use of water from the Apalachicola-Chattahoochee- Flint and Coosa-Tallapoosa River Basins. Active, ongoing discussions will continue between the states in order to address water supply and allocation at various scales and locations throughout the basin (Upper Chattahoochee Riverkeeper 2006).

  As described above, substantially altering the current conditions (e.g., flow, turbidity and water levels) of Uchee Creek could have a negative indirect effect on designated Critical Habitat for the shiny-rayed pocketbook.

- ***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 645 acre site and is scheduled to begin production in 2009. It 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 5 supplier facilities in GA (Jones 2006).

  While this facility will not be within the Action Area, the supplier facilities are considering locating in the Columbus/ Phenix City area. Secondary development is expected within the Action Area in the form of retail, commercial and residential-type growth (Jones 2006). As with the general urban growth described above, this development will reduce the amount of land available for long-term conservation of listed species habitats adjacent to or near the Installation. Acceleration of the ACUB initiative described in Section 8.6 will help to reduce this effect.

- ***Columbus Metropolitan Airport Forecast Demand.*** The GA Department of Transportation (GA DOT) estimates that the Columbus Metropolitan Airport will grow in terms of operations and aircraft based at the airport. In 2007, approximately 26% of the airport's available annual operating capacity was utilized. By 2012, utilization of the airport's annual operating capacity is expected to increase to 33%. In 2021, it is estimated that there would be approximately 169 based aircraft and 65,946 flight

operations at the airport versus 2006 when there were approximately 143 based aircraft and 51,591 flight operations (GA DOT 2003).

8. STANDARD ENVIRONMENTAL PROTOCOLS AND ONGOING CONSERVATION EFFORTS

The protocols and on-going conservation efforts described below should be considered part of the proposed action.

8.1. THE FORT BENNING NEPA PROCESS

As mentioned in Section 2.3, every action with a potential environmental effect (e.g., training exercises, timber operations, construction) must be preceded by the submission of a completed Fort Benning Form FB144-R REA to the EMD DPW. Submittal of the Form FB 144-R constitutes the first step in NEPA compliance at Fort Benning, and also is used to evaluate and monitor ESA compliance. The NEPA process determines if a proposed action qualifies for a categorical exclusion and is exempt from further NEPA consideration, or has been adequately covered by some other NEPA document (EA or EIS), or needs to have a NEPA document prepared.

Each organization at Fort Benning with projects or activities that may impact human health and the environment, including natural and/ or cultural resources, is required to submit a FB Form 144-R at the beginning of the planning process, along with information that includes a concept of development or description of the proposed action, the proposed site location, the anticipated timeframe of accomplishment and other relevant information. The proponent of an action must clearly identify the purpose of, and need for, the action and submit the FB Form 144-R in time to identify problems and conflicts in order that a review and analysis of alternative sites, or altered operational plans, can be developed in time to support the proposed action.

The normal "shelf life" of a FB Form 144-R is one year from the date of approval. All actions that are not underway within this time period must be submitted for an updated review and approval. If changes are made in an action's scope, location or degree of impact to natural or cultural resources, a new FB Form 144-R must be re-submitted for review and approval. Additionally, for complicated projects, or for projects that may involve soil disturbing activities, both a design phase FB Form 144-R and a construction phase FB Form 144-R may be warranted.

After review by the EMD, the FB Form 144-R will be returned to the proponent marked Concur, Concur with Conditions or Other. A finding of Concur allows the project or activity to move forward as proposed. A finding of Concur with Conditions allows a project to move

forward only after all comments are addressed and plans are in place to comply with the comments and concerns. It may also include information about restricted areas such as RCW clusters, gopher tortoise areas or archeological sites, training that may or may not occur in these areas and other protocols. When a finding of Other is received, a project or activity may be categorized as 1) non-concur and the project cannot take place until it is modified as necessary and a new FB Form 144-R is submitted, 2) additional information is requested to complete the analysis (i.e. scopes of work, design drawings, specifications, maps and site approval), and 3) the proposed action does not qualify for a categorical exclusion and a higher level NEPA document (EA or EIS) is required. All proposed project changes or modifications require submittal of a new FB Form 144-R and cannot proceed until a new finding of Concur, or Concur with Conditions has been issued and all concerns addressed.

Some actions/ activities are recurring and a single FB Form 144-R can be submitted to cover it for a specific FY.

Non-compliance with this NEPA process will result in the proponent of the action violating Federal law and Army policies. The proponent will be held responsible for adverse impacts to Fort Benning's natural or cultural resources and may be responsible for the cost of repair, replacement or mitigation required to correct the unapproved action. Violations will be reported as appropriate to the FBRD, EMD, the Office of the Staff Judge Advocate, the Contracting Officer and/ or the proponent's Commanding Officer. Criminal violations of the ESA will also be reported and investigated per Army policy.

All Transformation and MCOE projects will continue to be approved using the process described above to ensure compliance with ESA and the terms of the applicable biological assessments and BOs. If environmental impacts differ from those approved in the applicable BO, the appropriate level of consultation (formal or informal) with USFWS will be reinitiated.

8.2. ENVIRONMENTAL AWARENESS TRAINING AND PROGRAMS

Since 1999, an Environmental Awareness Training Program has been in place to instruct Fort Benning personnel about environmental issues, both to prevent environmental incidents and to protect personnel from financial and legal consequences of such actions. Education is targeted towards personnel with specific responsibilities: one course is targeted toward senior leadership, such as the executive officer of a brigade or battalion-sized unit, while others may be targeted to

the supervisory field personnel or to entire groups of visiting Soldiers (Appendix J). Due to the high influx of personnel expected with the USAARMS arrival, it is possible that these courses will be taught at Fort Knox prior to a units' arrival at Fort Benning. If not, then these courses will be offered more often at Fort Benning to ensure adequate and timely training of the newly arrived troops.

Training guidelines and restrictions within RCW clusters have also been included in Fort Benning's Training Directive (USAIC Regulation 350-1) and Range and Terrain Regulation (USAIC Regulation 210-4).

8.3. ONGOING RESEARCH

8.3.1. FOREST DECLINE/ FOREST RESTORATION

Several studies are currently being conducted at Fort Benning on longleaf and loblolly pine decline. These studies are in response to recent observations (since 2000) of Installation-wide reductions in pine vigor and elevated pine mortality rates. The loss of individual trees in aging stands that are at or near the minimum thresholds of pine density and BA elevates RCW recovery risk in the affected areas. These issues may result in further complications such as age-related "bottlenecks" associated with stand-level malaise and early senescence.

A 5-year study currently underway is focused on effectively converting off-site loblolly pine stands to longleaf pine while preserving the maximum amount of RCW foraging habitat. This study will develop silvicultural protocols for site conversion and models to assess stand vulnerability to decline and to predict individual tree mortality, in order to prioritize stands to convert and in selecting leave-trees (J. Walker, USFS, unpublished report).

A 3-year study scheduled for completion in 2008 is being conducted on longleaf pine decline, which has also been observed on Fort Benning. Objectives include gaining further understanding of the pathogenicity of the condition (potentially an exotic species of blue stain fungus species), developing a model to predict stand vulnerability to longleaf decline and determining the overall health and condition of longleaf stands on Fort Benning (L. Eckhardt, Auburn University, unpublished report).

A recently funded research project will begin 2009 (Walker, USFS, unpublished report). This project will focus on local and regional pine forest health issues, and forecast stand level implications of acute and chronic pine health problems relative to site conditions and RCW

recovery standards. This study will also identify critical stand level forest health monitoring parameters.

Another study is integrating models of RCW population dynamics, forest growth, pine decline and forest management in order to provide Fort Benning with a means to predict the effect of new developments and fragmentation on the RCW population (C. Rewerts, unpublished report). This project will be completed in January 2009.

Fort Benning is also investigating acquisition of various types of remote sensing imagery which could be valuable in identifying declining stands. Currently, researchers at the University of California at Davis are investigating "early-warning" detection techniques using Light Detection and Ranging (LIDAR) and other hyper-spectral imagery techniques. Early detection would allow Fort Benning sufficient time to develop an appropriate stand level response and reduce the likelihood of pathogen transfer between adjacent trees and stands.

The forest decline issue will be addressed in greater detail in the revision of Fort Benning's INRMP and its RCW Endangered Species Management Component.

8.3.2. RANGE CONSTRUCTION AND OPERATION IMPACTS TO RCWS AND HABITAT

As part of the minimization for the DMPRC and as directed, in part, as a RPM in the DMPRC BO (USFWS 2004), home range follows of RCW groups potentially affected by that project are being conducted in order to determine RCW reaction to construction and operation of a large-caliber range. This range is currently under construction and is expected to be operational in 2010 (F. Weekley, Fort Benning, pers. comm.). By the time the proposed MCOE ranges are built, there should be applicable data on the reaction of RCWs to construction and training on the DMPRC. The types of training and artillery used on the DMPRC will differ from these on the proposed MCOE ranges, however, data from the DMPRC group follows will be applicable, at least in part, to the proposed ST and MPMG ranges.

Habitat monitoring was also required in the DMPRC BO in order to document RCW foraging habitat degradation resulting from range operation (USFWS 2004). The *Impact of the Construction and Use of a Digital Multipurpose Range Complex on the Red-cockaded Woodpecker (Picoides borealis) Home Range and Habitat Use on Fort Benning* (Fort Benning

2004c) (DMPRC Habitat Monitoring Plan) was developed and submitted to the USFWS in August 2004.

According to the Transformation BO (USFWS 2007a), a Habitat Monitoring Plan to address BRAC/ Transformation impacts will be submitted to the USFWS (due in July 2009). If impacts identified in the DMPRC Habitat Monitoring Plan and the forthcoming Transformation Habitat Monitoring Plan are inconsistent with those predicted for ranges in this MCOE BA document, Fort Benning will seek input from USFWS and reinitiate consultation, as necessary.

In addition to habitat monitoring around the DMPRC, FBCB and FBLMB will continue to implement the RCW foraging habitat monitoring recommendations in the 2003 Recovery Plan (USFWS 2003a). Tracking the habitat available within RCW partitions Installation-wide, including changes in vegetative structure and composition, will be particularly important in monitoring the effects of Transformation on affected RCW clusters and ensuring that enough future habitat remains protected for the RCW population at Fort Benning to ultimately recover.

8.3.3. HISTORY OF FIRE ON FORT BENNING

Fort Benning has contracted Dr. Cecil Frost to conduct the necessary analyses and produce a report describing the presettlement/historic vegetative cover and fire history on the Installation. These data will assist Fort Benning in determining which habitat on the Installation would have historically been subjected to periodic fire, and at what frequency and intensity. This will assist Fort Benning with longleaf restoration on the Installation and could also be useful for management of any rare species, ranging from fire-dependent to fire-intolerant. Fort Benning expects to have a final report detailing the results in December 2008.

8.3.4. POPULATION LEVEL MODELING

Fort Benning is currently working with Dr. Jeffery Walters of Virginia Polytechnic Institute to run population level modeling of the Fort Benning RCW population. This model will be helpful in predicting how RCW clusters may populate the Fort Benning landscape in the future. The model requires a land coverage map as well as the locations of RCW clusters in order to predict how the birds may respond to habitat changes including reforestation, age and habitat removal. Several different scenarios will be tested in order to provide additional information regarding various impacts associated with the Transformation and MCOE actions, as

well as possibly including off-post properties adjacent to Fort Benning to some as far away as Fort Gordon and Fort Jackson. Initial runs will include the current Fort Benning landscape in order to establish a baseline and determine if the current habitat configuration will support a recovered RCW population. Successive runs of the model will determine how various projects may impact Fort Benning's ability to reach its stated recovery goal. Fort Benning expects to have a report of the results during formal consultation with USFWS for this proposed action, although some scenario results may be available earlier.

8.3.5. EVALUATION OF TRANSFORMATION/ MCOE TRAINING EFFECTS ON RCWS

Fort Benning has contracted Dr. Tim Hayden with the Engineer Research and Development Center (ERDC) to conduct a study evaluating the effects of Transformation and MCOE activities on the Installation's RCW population. This project will be similar in design to the study assessing the effects of maneuver training activities on the RCW population at Fort Stewart, GA, conducted by the ERDC (Hayden et. al. 2002). In September 2008, Fort Benning committed $15K of funding to support development of the research project design and has budgeted $150K for FY09 to support the first 2 years of research that is anticipated to last up to 5 years.

The focus of this study will be to determine effects and trends in the RCW population and habitat resulting from training and habitat modifications associated with Transformation and MCOE actions. The study will also characterize and quantify training activity in endangered species habitats and determine if any relationship exists between training activity and the RCW population and habitat parameters. In addition, a population viability analysis using Population Viability for Avian Endangered Species computer model (PVAvES 1.0) will be used to determine RCW population level effects of military disturbance. This will be used to answer the question: What hypothetical effects on RCW population viability would accrue if various proportions of RCW breeding habitat on Fort Benning were subjected to high levels of potentially disturbing human activity? The population viability analysis will provide a probabilistic evaluation of extinction risk over time and the recovery probability for the RCW population on the Installation. A preliminary baseline population viability analysis for the Installation's RCW population is expected to be completed by November 2008. This analysis

will allow the Army to determine the RCW population's risk of extinction if certain percentages of the population are exposed to high levels of disturbance.

Development of a research design proposal is anticipated to begin around January 2009. The research monitoring plan will review the current Installation data availability, examine potential changes or augmentation to the current Installation RCW population and habitat monitoring programs in order to meet research design requirements, determine the best approach to quantify military training activities associated with the RCW population and habitats, analyze data to quantify relationship between training and RCW response, identify an appropriate population modeling approach to evaluate anticipated population response to observed empirical relationships between training and demographic/ habitat factors, and detail the total estimated cost and duration for the research monitoring plan when implemented.

8.4. TIMBER HARVESTING AND MANAGEMENT

8.4.1. CONSTRUCTION PROJECTS

Many BRAC construction projects will be design-build. This means the final design will not be complete until after contract award. Once the contract is awarded and the contractor has finalized the design, the construction contractor will survey and mark the clearing limits for construction. FBLMB personnel will then mark the areas that will need to be clear-cut in support of Transformation construction using red timber marking paint. FBLMB and/ or the USACE Resident Forester will monitor timber operations for compliance with Georgia Forestry BMPs for water quality, streamside management zones and timber/ vegetation removal. In clear-cut areas, all merchantable/ saleable trees $\geq$ 5 in. dbh and $\geq$ 30 ft. tall or larger will be removed within the red painted boundary (J. Parker, FBLMB, pers. comm.)

8.4.2. THINNING WITHIN MANEUVER HEAVY USE AREAS

FBLMB will coordinate with the Armor School trainers for thinning of heavy maneuver areas. Sensitive areas will not be harvested in order to aid in protection from heavy training maneuvers. FBLMB and/ or the USACE Resident Forester will monitor timber harvesting for compliance with GA Forestry BMPs.

8.4.3. OTHER STANDARDS AND NORMAL ACTIVITIES TO OCCUR BEFORE AND DURING TIMBER HARVEST ACTIVITIES.

Soil disturbance will be minimized in wetlands (except where permitted in construction areas) and historic property sites. Cut-to-length will be the only authorized process used for timber harvest from eligible historic property sites and other sensitive areas that may be identified later.

If the harvest is performed by a USACE contract, the USACE Resident Forester will monitor the timber harvest and prepare a biweekly written report to the FBLMB Chief. These reports will document compliance with all applicable minimization and/ or mitigation requirements and/ or restrictions, including compliance with Forestry BMPs, any deviations from the same and any corrective action that was taken.

FBCB personnel will conduct an RCW survey of all project footprints and all suitable habitat within a 0.5 mile radius of any project that may impact RCW cavity trees and/ or habitat. All surveys will be conducted within 1 year prior to habitat clearing or timber harvest. If surveys are more than 1 year old, FBCB will resurvey the area to ensure that this guideline is met. In addition, a FHA will be conducted prior to removal of pine habitat. Timber harvesting within RCW clusters will occur outside of the breeding season (April - July) and will be coordinated with FBCB.

The Army will reinitiate formal or informal consultation with USFWS if during field surveys and/ or analyses, additional project impacts are identified that were not analyzed.

8.5. TOTAL LAND MANAGEMENT STRATEGY

The combination of the proposed increase in heavy maneuver training and the terrain and soil conditions at Fort Benning has the potential to create major soil erosion problems, which could have adverse effects on the RCW and other Federally-listed Threatened and Endangered species if not mitigated.

Avoidance and minimization of impacts to RCWs will be accomplished by a combination of institutional and engineering controls and the programming of adequate resources necessary to proactively manage the impacts of the Transformation actions. Fort Benning has developed a management system and plan along with the appropriate organizational structure to proactively manage the impacts of Transformation training activities, which will be continued and/ or

enhanced for the proposed MCOE actions. One key function of this strategy is to attain resources for land maintenance personnel to effectively respond to issues. Soil erosion can escalate quickly and can cause substantial damage to the landscape if not repaired.

The Land Rehabilitation and Maintenance (LRAM) component of the Integrated Training and Management (ITAM) program is the Army's premier program for land rehabilitation, restoration, maintenance and sustainment of training lands. Currently the only source for repair is the USDA Natural Resources Conservation Service (NRCS). Range Division is in the process of establishing an indefinite delivery/ indefinite quantity (ID/IQ) contract for land rehabilitation and repair to provide another vehicle so more projects may be completed in a shorter period of time. Range Division is also looking into the establishment of in-house maintenance capability in order to respond rapidly to the heavily used areas in order to maintain the areas in a safe and usable condition. In the past several years, based upon the level of funding received, LRAM has completed 4 water crossings and restored approximately 100 acres of the Southern Maneuver Area to safe and usable training land (J. Markham, Fort Benning, pers. comm.).

Future erosion control measures include the installation of 9 turn pads in the Southern Maneuver Area, 20 water crossings in the 19D/K OSUT Maneuver Area and 39 water crossings and 43 turns pads in the Good Hope Maneuver Area as part of MILCON in FY09. A series of strategically located sedimentation basins supported by the BMPs and including rock rip-rap, vegetation and diversions are being designed for each of the maneuver areas to minimize erosion.

As per the Transformation BO (USFWS 2007a), RPM #3 states that Fort Benning must "Develop the Installations Land Management Plan that focuses on the Soil Conservation Program and Sustainable Ranges." Further, Terms and Conditions #3 states that the "Land Management Plan" should include: organizational structure that can support this initiative, strategies to abate significant training impacts in highly erodible soils, a management system with protocols that specify areas to rotate to when erosion impacts breach thresholds in the proposed maneuver areas, and specific roles and protocols for ITAM and how the RTLP will be implemented. This plan must be completed no later than 30 November 2009."

Components of the total land management strategy include the following:

8.5.1. SOIL CONSERVATION PROGRAM, NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND SOIL EROSION CONTROL PLAN

The Soil Conservation Program addresses erosion and sedimentation in RCW habitat as required by the BO for the RCW ESMP (USFWS 2002) and the BO for BRAC (USFWS 2007). The ESMP BO requires Fort Benning to repair existing, and prevent future, erosion that threatens individual RCW cavity trees and the integrity of the cluster. BMPs employed to prevent erosion and rehabilitate eroded areas include the construction and maintenance of rock channels, rock check dams, sediment basins, diversions and silt fencing. Vegetative measures include temporary and permanent grassing, mulching and the installation of erosion control blankets. Longleaf pines are planted to further stabilize the project sites and to provide habitat for the RCW. These practices are part of erosion control plans implemented by the USDA Natural Resources Conservation Service (NRCS) through a Memorandum of Understanding (MOU) and the USACE (a MOU with the USACE is not necessary since it is part of the Army). The services provided include solicitation of bids, developing contracts, performing surveys, preparing plans and the implementation of those plans. It takes approximately 1 year to get BMPs constructed from the time the money is sent to the receiving agency until project completion. Projects can be completed sooner depending on the backlog of projects that exists with the NRCS (G. Hollon, Fort Benning, pers. com.).

Construction projects or any land disturbing projects larger than 1 acre also require a NPDES permit, which requires a Soil Erosion and Pollution Control Plan. These plans utilize BMPs to reduce erosion and sedimentation. Variances may be required for disturbance or vegetation removal within the stream buffers.

The ITAM Program has funded NRCS to prepare a watershed protection plan for the Good Hope Maneuver Area, the Southern Maneuver Area and the Northern Maneuver Area. This plan is currently being drafted. The watershed protection plan and the BMPs that include strategically placed sedimentation basins, rip-rap, and vegetation are designed to be installed after construction is complete and will augment those erosion control measures such as the low water crossings and turn pads being installed during construction.

8.5.2. SUSTAINABLE RANGE PROGRAM (SRP)

The SRP is the Army's roadmap for how it designs, manages and uses it ranges in order to ensure the capability, availability and accessibility of its ranges to meet its training mission. It is the Army's response to the increasing challenges brought about by incompatible land uses and meeting the ever increasing need for ranges and training land brought about by the GWOT, the Army Campaign Plan, BRAC and GDPR. Because many programs and functions affect the management of the ranges and training lands, the SRP is the Army's overarching guidance for integrating operational, training, facility, safety and environmental requirements to improve the management of its ranges and ensure their sustainability to support mission requirements now and into the future.

The Army's SRP is made up of its 2 core programs: the RTLP, which includes the day-to-day management of its ranges as well as new range construction and the ITAM program for the repair and maintenance of its maneuver lands. AR 350-19 defines and prescribes policies for implementing the SRP on Army controlled training ranges and training lands. A description of this program, termed the Fort Benning Sustainable Range Program can be found in Appendix K.

8.6. ADDITIONAL PERSONNEL

BRAC/ MCOE Mitigation & Monitoring Coordinator. Fort Benning has hired 1 environmental compliance officer , who will oversee all Transformation and MCOE construction activities in order to ensure that proponents, contracting officers and contractors adhere to applicable laws and binding agreements with regulatory agencies.

BRAC RCW Biologist. One FBCB biologist was hired in April 2007 to oversee all Transformation-related RCW monitoring, track impacts to RCWs and habitat, provide minimization recommendations to engineers and handle Transformation-associated USFWS consultations. This biologist also oversees MCOE actions.

RCW Support Technician. One field technician was hired in August of 2008 to assist the BRAC biologist with RCW monitoring, surveys and all other management requirements for BRAC/Transformation impacted groups. One additional seasonal technician may be hired as the need arises.

8.7. TRAINING AREA ACCESS

As described in Section 6.8.3, with the increase in training activities and the number of new ranges proposed, access to training areas will become extremely challenging. The Access Plan for Transformation (Fort Benning 2008c, Appendix D) will be updated as needed to allow access by FBCB and FBLMB personnel for activities such as RCW monitoring, cavity maintenance, timber management and prescribed burning in restricted areas such as areas covered by SDZs.

A Range Division Movement Control Center is planned to oversee the operations of the new ranges. This center should have the capabilities to track all activities in all training areas on the Installation. This level of organization has the potential to assist FBCB and FBLMB with scheduling the maximum amount of time in available "windows."

8.8. CO-USE AND SUBDIVISION OF CURRENT TRAINING COMPARTMENTS

Range users such as military units and FBLMB who wish to reserve areas for training, timber harvesting, prescribed burning or other activities typically must reserve entire training compartments to ensure that there is no conflict between them. Often, however, only a small portion of the compartment is actually used. For approximately 10 years, Fort Benning has scheduled co-use of some training areas between military training exercises and other user groups. Over the past year, due to increased training demands on all training areas, Fort Benning has worked to increase co-use of training compartments between compatible users. Co-use will continue to be a goal in non-live fire areas.

FBRD is also in the process of permanently sub-dividing some training compartments into smaller units. Dividing large compartments up allows users to reserve areas that are closer

in size to the area they will actually use, leaving the remaining areas available to other groups. FBRD is coordinating with FBLMB to use some of the boundaries that FBLMB has created to subdivide larger compartments into burn units. Fort Benning will complete this mapping no later than November 2009.

Increasing co-use and redrawing compartment boundaries will help to minimize scheduling conflicts, ensuring that protected species and their habitat continue to be sufficiently managed and monitored post-Transformation and post-MCOE.

8.9. LESSONS LEARNED FROM OTHER INSTALLATIONS

Fort Benning and JCA have sought input from other installations with heavy maneuver training and RCWs. Correspondence with representatives from Fort Stewart, GA and Fort Polk, LA and Fort Knox, KY has further illustrated the need for proactive land management and the need to minimize impacts through landscape design (e.g., thinning corridors in maneuver areas to direct tank traffic).

8.10. CONSERVATION OPPORTUNITIES OUTSIDE THE INSTALLATION

8.10.1. ADDITIONAL MILITARY TRAINING LAND

Most major Army installations, including Fort Benning, are facing a training land deficit. Therefore, the Army has developed a strategy to examine its training land needs across the United States. This strategy not only identified shortfalls in available versus required training land, but listed 4 alternatives to address this shortfall 1) buffering existing land (ACUB), 2) sustainable management, 3) use of other Federal/ State land and 4) purchasing additional training land. Fort Benning is carefully considering all of these potential alternatives to address future training challenges.

If purchasing additional training land is determined as a feasible and reasonable course of action, the intent would be to purchase additional training land around Fort Benning in order to address future mission training needs and enhance mission capability. Such a purchase may

have the secondary effect of reducing the concentration of training on the existing acreage of Fort Benning, thus potentially promoting RCW survivability and recovery. Feasibility factors for purchasing additional training land include: 1) cost effectiveness, 2) low population density, 3) land that is accessible from Fort Benning, 4) land that is compatible with environmental conditions and requirements and 5) land that is available for sale by willing sellers.

8.10.2. ACUB PROGRAM

Through its partnership with TNC, Fort Benning is already pursuing "off-post" conservation measures intended not only to buffer the Installation boundary from land uses incompatible with adjacent military training and land management, but also to protect and restore habitat for listed, imperiled or at-risk species that impact Fort Benning's mission. The ACUB Program at Fort Benning was approved in early 2006 and funded later that same year. Approximately half of the initial funding awarded to TNC in 2006-2007 was used to secure 3 parcels that buffer Fort Benning's northeastern boundary, while providing important wetland and stream protection, gopher tortoise habitat protection/ restoration and long-term RCW restoration potential. These parcels, totaling 873 acres, were purchased in fee. After restoration management has been initiated by TNC and Fort Benning, the properties will be encumbered with permanent protective easements and will be sold to conservation buyers. In addition to this project, additional ACUB funding was used to acquire an 1,100-acre conservation easement on the northeastern corner of the Installation. This easement was a full donation from the landowner, and protects important Fall Line streams, wetlands and a significant population of the Federally-Endangered relict trillium.

Additional projects under negotiation along or near the northern and eastern boundary include additional fee-purchase/ conservation-buyer transactions, easement purchase transactions and a combination upland-easement/ wetland mitigation bank project. In addition, the Army is making funding available to TNC for a 700-acre fee-purchase opportunity. Table 8-1 summarizes the ACUB project status in terms of transaction completion, type of protection and potential pine habitat. Individual parcels are not identified as confidentiality is necessary for

transactions currently being negotiated. Table 8-1 indicates that of the 17,100 ACUB acres projected through 2009-10 closing, 3,300 acres can eventually be restored to suitable RCW connectivity to the northern and eastern boundary of Fort Benning.

The ongoing ACUB program has produced substantial mapping, land-use studies, habitat assessments, landowner outreach and field reconnaissance which will be valuable in seeking "off-post" alternatives for offsetting some of the impacts of MCOE. A more detailed description of this program can be found in Appendix F.

In order to offset adverse impacts of the proposed action, the Army is proposing to accelerate the ACUB program substantially. These conservation measures are described in Section 9.11.

8.10.3. ADJACENT RCW HABITAT

The active ACUB projects on the northern and eastern boundaries of Fort Benning provide excellent opportunities for RCW habitat restoration. Portions of these parcels support loblolly pine plantation stands ranging up to 25 years old. With thinning and fire management these areas can support RCW foraging in a fairly short time-frame (5 to 30 years), and eventually nesting habitat (60 to 80 years). Conversion to longleaf pine can be part of this management over time, in much the same way that loblolly and shortleaf stands on Fort Benning are gradually being converted via underplanting and opportunistic stand conversion. A necessary component of such a strategy would be a conservation easement and/or conservation banking instrument or long-term public-agency ownership (where willing sellers are available) that provides credible assurance of such restoration management. Funding mechanisms for such long-term management must also be determined.

Several nearly-adjacent fire-managed properties, with a single owner, located near Fort Benning's western boundary provide another opportunity for additional RCW habitat amenable to occupation by Fort Benning's population. Approximately 3,000 acres of these properties are frequently burned for wildlife management. Over 4,000 acres are already encumbered by a pre-ACUB conservation easement held by a local land trust. TNC and the Army have approached the landowner regarding protection of an additional 4,000 acres, 2,000 acres of which are upland pine.

Table 8-1. Project status of the Fort Benning Army Compatible Use Buffer (ACUB) program, September 2008.

Protection Status [1]	Protection Instrument	Total Acres [2]	Adjacent Upland Pine Acres [3]	Other Upland Pine Acres
Secure	Fee acquisition [4]	1,700	500	400
	Donated easement	1,100	300	
Under negotiation, Close in 2008	Fee acquisition	1,400	800	
	Purchased easement	900	500	
Planned for 2009-10 closing	Fee acquisition	1,000	600	
	Purchase easement	1,000	600	
	Donated easement	10,000	____	6,000
Totals		**17,100**	**3,300**	**6,400**

[1] Project acreage identified as "secure" and "under negotiation" reflect a high degree of confidence in The Nature Conservancy's ability to obtain land interests. "Planned" projects are somewhat more speculative and depend on landowner willingness to sell or donate their property interests, which is currently uncertain.

[2] All acreage rounded to nearest 100. All projects listed are located in Georgia, on or near the northern or eastern boundary of Fort Benning.

[3] "Adjacent Upland Pine Acres" refers to acreage that can eventually be restored to suitable RCW habitat with connectivity to Fort Benning.

[4] Fee acquisition parcels acquired in fee by TNC will be resold to conservation buyers or partner agencies with any proceeds reinvested in the ACUB program.

A recent cursory inspection of the best habitat on this property, near the western boundary of Fort Benning, revealed that the forest lacks the pine density and maturity necessary for immediate establishment of RCW clusters. The future potential of this property to provide additional RCW habitat should not be ignored. The management and/ or disposition of this property should be closely monitored for opportunities to improve habitat conditions.

8.10.4. NON-ADJACENT RCW HABITAT

Large tracts of mature fire-managed pine habitat are located 5 to 50 miles west of the Installation (in AL) and approximately 10 miles south of Fort Benning. One of these AL properties, approximately 30 miles west already has a conservation easement. This property has a small RCW population that was augmented by RCWs translocated from Fort Benning in 2007. The property includes approximately 12,000 acres of mostly unoccupied but probably suitable RCW habitat. This landowner has shown interest in RCW management by becoming the first enrollee in AL's RCW Safe Harbor Program. In the future, this property may be able to accommodate a separate RCW support population for Fort Benning's Primary Core Recovery Population.

Several of the other AL properties and the GA property range in size from 2,000 to 5,000 acres. Some of these properties are known to have had small numbers of RCW groups in the past 10 to 20 years. One RCW from Fort Benning was observed on Enon-Sehoy Plantation in 2008, which currently supports 6 active clusters (see Section 6.8.2.1). In spite of this one dispersal event, if any of these properties become occupied by larger, more viable RCW populations, it would be unclear if they would provide the "demographic and genetic link" required to be considered part of Fort Benning's recovery population.

Other areas of regional interest, outside Fort Benning, but with RCW habitat potential include Tuskegee National Forest in AL (35 miles west-northwest), the Callaway Preserve and Franklin Delano Roosevelt State Park on Pine Mountain (25 miles north, separated by metro Columbus), Sprewell Bluff Wildlife Management Area and State Park (25 miles north-northeast), and a large

private landowner who has established a few thousand acres of longleaf pine plantation all less than 10 years old (7 miles east). This latter property is adjacent to an 800-acre TNC property, about half of which has 20-year old longleaf pine and which is now being managed for gopher tortoise habitat, groundcover restoration and Fall Line wetlands. An ACUB-funded conservation easement for this 800-acre tract (Black Jack Crossing) is being sought.

TNC and its conservation partners are seeking protection of all these habitat areas and the restoration of RCW populations, but under current RCW recovery policies, these efforts will only be relevant to Fort Benning's recovery goal if habitat protection and occupation is built incrementally and contiguously outward from Fort Benning's RCW habitat. Also, some of these areas lie outside of Fort Benning's approved ACUB zones and some have already lost (or will soon lose) the potential for connectivity. The need to minimize MCOE impacts on Fort Benning's RCW population may offer new incentive for the Army to invest in a regional multi-population or meta-population approach to RCW conservation.

8.10.5. MANAGEMENT OF OFF-POST RCW HABITAT

Typically ACUB lands are owned in fee and managed by private landowners, non-profit organizations, or non-DOD public agencies subject to easements or deed restrictions that protect Army interests such as encroachment buffering or habitat protection. Urgent needs for habitat restoration and protection to enable endangered species recovery have created increased interest in additional mechanisms for long-term habitat management. Fort Benning and TNC have explored the following strategies, some of which are being implemented:

- Access license and right-of-entry for Army land management staff and contractors to engage in land management practices on ACUB tracts, in collaboration with the landowner. The first example of these instruments has been negotiated and is in the process of being finalized with TNC, Fort Benning Garrison and USACE to begin longleaf pine restoration on 2 ACUB tracts owned by TNC.

- Partnership with GA DNR to receive fee title to ACUB tracts as State Wildlife Management Areas to be managed in perpetuity by the State for both public recreational activities and RCW habitat. Preliminary discussions with GA DNR are underway.

- Partnership with for-profit timber investment and/or conservation banking entities with business models that accommodate RCW habitat restoration and management. In this case, habitat management practices by the for-profit owner would be funded by the purchase of species credits by the Army. Preliminary discussions with for-profit entities are underway.

- Development of a conservation easement model that obligates the landowner to take affirmative actions to restore habitat and manage RCW clusters, such that the easement grantee and/or the Army would have the right to step in and conduct such management should the landowner fail to do so. Such an easement is being negotiated as part of a TNC-Fort Polk ACUB transaction and is under consideration for adaptation to Fort Benning's ACUB.

8.10.6. OTHER CONSERVATION ELEMENTS

ACUB projects focused on gopher tortoise, relict trillium or other conservation elements less dependent on such large (multi-thousand-acre) areas of habitat are still being pursued regardless of adjacency to Fort Benning, although adjacency and proximity to the Installation increases their likelihood of ACUB funding. Opportunities to protect and restore disconnected, but potentially viable populations of gopher tortoises are of particular interest to both Fort Benning and TNC. The gopher tortoise, already Federally-listed west of AL's Tombigbee River, is 1 of the highest rated "Species At Risk" by the Army since it is so prevalent on Fort Benning and other southeastern Army installations, and is under petition for Federal listing in the remainder of its range. The Fall Line Sandhills extending away from Fort Benning's northeastern boundary have the most frequent occurrences of the tortoise outside of Fort Benning

and offer the most compelling opportunities for protection and restoration by TNC and its partners. Especially compelling are those tracts where additional conservation priorities (e.g. rare plant communities, Atlantic white cedar, Fall Line stream watersheds) overlap or adjoin tortoise habitat.

9. MINIMIZATION MEASURES

The minimization measures described below are to be considered part of the proposed action. The following measures will be taken wherever applicable in order to minimize impacts to RCWs and relict trillium affected by the proposed action:

9.1. MINIMIZATION AND AVOIDANCE- PROJECT DESIGN

Fort Benning personnel have reviewed each "take" expected from the proposed action and to determine what minimization measures can be taken. By revising limits of construction of roads and ranges, the "take" of 9 RCW clusters have been avoided.

9.1.1. CANTONMENT AREA PROJECTS

Limits of construction for cantonment area projects were delineated in order to minimize, to the extent practicable, impacts to habitat, other species of concern, wetlands and archaeological sites. RFPs will contain site plans with environmentally sensitive areas taken into account and Fort Benning will continue to work with USACE Project Mangers and their design firms to further minimize Federally-listed species impacts as much as practicable (D. Miller, Fort Benning Master Planning Division, pers. comm.).

9.1.2. RANGES

Although many cavity trees are within the limits of construction analyzed for new ranges, there are some cases where the entire limits of construction will not require 100% clearing. FBCB personnel are working with USACE Project Mangers, Master Planning and Range Division representatives and their design firms during planning charrettes to minimize impacts where practicable. As ranges are designed, efforts will continue to avoid cavity trees and foraging habitat. At this time, FBRD and USAARMS personnel expect to be able to retain most, if not all, RCW cavity trees within range support areas (areas outside the range footprint) and the Vehicle Recovery Course (F. Weekley, FBRD and C. Stoinoff, USAARMS, pers. comm.). Line-of-sight analyses are being conducted for each range during design and assist biologists in calculating munitions impacts to downrange habitat and determining where to focus minimization efforts (e.g., placement of environmental berms or shifting of targets).

9.1.3. ROADS

Proposed new road construction and road upgrades/ widenings are in the design phase and as project sites are surveyed and plans are solidified, RCW and relict trillium impacts may be appreciably lessened. FBCB personnel will continue to work with USACE Project Managers and their design firms to minimize RCW cavity tree and foraging habitat impacts as much as possible in an effort to potentially avoid take of any of the affected clusters in the area. Some impacts from a proposed fence, asphalt road and bridge to the Randall Creek North relict trillium population appear to be unavoidable, however, this impact will be minimized as much as possible during design.

The efforts described above will be utilized whenever possible and will minimize harm to RCWs by reducing direct and indirect cavity tree loss and loss of foraging habitat (Section 6.8.3) as a result of MCOE actions. The use of erosion control BMPs during construction of MCOE projects will also help prevent erosion and sedimentation loading (Section 6.8.3).

9.2. SPECIFIC CLUSTER MINIMIZATION STRATEGIES

9.2.1. ACTIVE CLUSTERS WHERE CAVITY TREES WILL BE REMOVED

All RCW cavities in trees that will be cut will be screened to prevent RCWs use at the time of cutting. In clusters where RCWs can be translocated, all cavities will be screened immediately after RCWs are captured and removed.

Cavity trees that are cut will be either destroyed onsite or collected for educational purposes with appropriate permitting from the GA DNR and USFWS. Active cavity trees will not be cut during the nesting season (April-July).

9.2.2. ACTIVE CLUSTERS TAKEN BY LOSS OF FORAGING HABITAT

Clusters which are "taken" because of insufficient post-project foraging habitat will retain the same level of protection they currently have (PRC or SRC). Painted bands will not be removed from PRCs and the 1996 Army Guidelines will apply within the 200 ft. and 50 ft. buffers (DA 1996). If, over time, groups at "taken" clusters survive, are productive and acclimated to the training disturbance and/ or reduced foraging habitat that triggered the "take," Fort Benning will formally request from the USFWS that those clusters be counted again towards Fort Benning's recovery and population goals. In addition, for clusters identified as

'taken' due to habitat loss, but that do not actually fall below SMS standards due to alterations in the final design plan; Ft. Benning will request their inclusion toward the population's recovery goal.

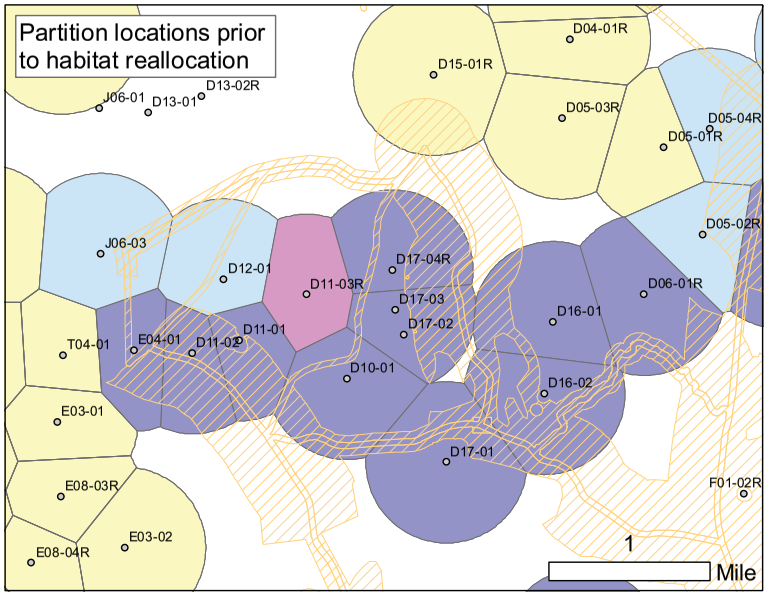
Continuing to protect and monitor the clusters that are "taken" by MCOE projects will allow Fort Benning to track the status of those clusters into the future. With USFWS approval, clusters that fall below the SMS standards, but remain active for 5 years, may be counted towards Fort Benning's recovery goal. Any taken RCW clusters that remain active can play a role in increasing (or maintaining) cluster density and population health, maintenance of demographic connectivity and continue to contribute fledglings for overall population stability and growth (Section 6.8.3).

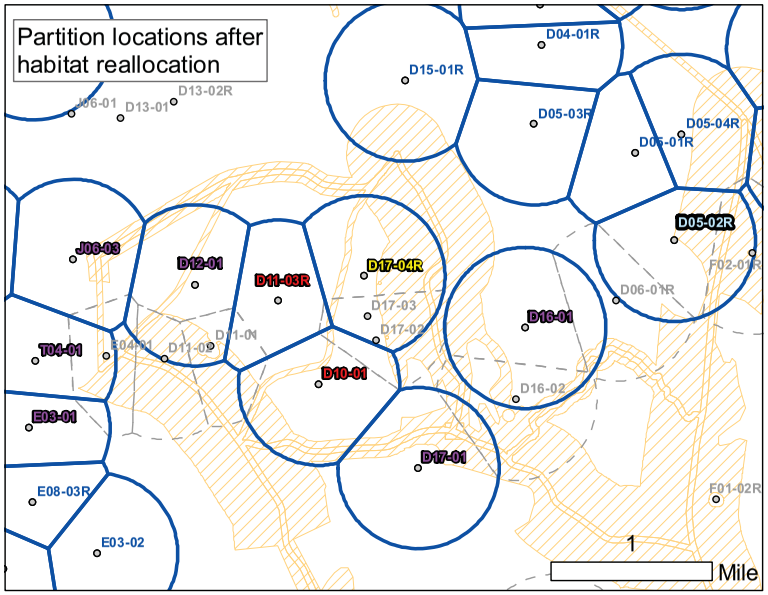
9.2.3. REPARTITIONING OF REMAINING HABITAT AT TAKEN CLUSTERS

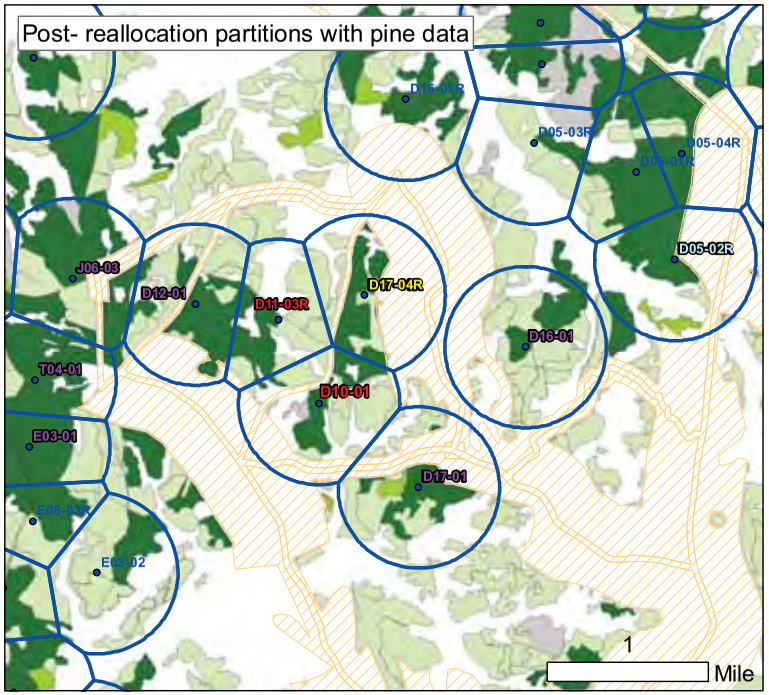
In order to minimize "take," in areas where 2 or more adjacent clusters were taken by loss of foraging habitat, the remaining habitat was reallocated and clusters were repartitioned. Eleven clusters (D10-01, D11-03, L02-02R, O01-01, O03-01, O03-02, O04-03a, O09-02, O10-03, O10-04 and O15-02) benefited and now their foraging partitions can meet the RS in the future with > 150 acres of habitat (Figure 9-1 and 9-2). Habitat was reallocated in 4 other taken clusters (D17-04R, K13-02, O01-04R and O14-02) and these partitions now contain between 120 and 150 acres of habitat and may meet the RS in the future (Figure 9-1- 9-3). Cluster K12-01 was taken due to cavity tree loss, but contained enough foraging habitat to meet the RS. If the cluster is shifted south, provisioned with artificial cavities and the resident group occupies the new cavities, K12-01 will not be considered taken (Figure 9-4).

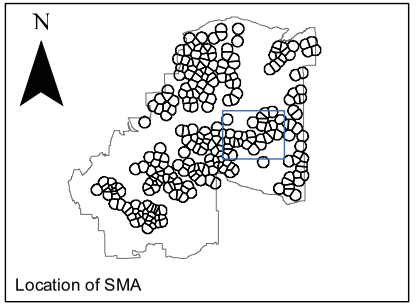
9.2.4. TAKEN CLUSTERS WITH POTENTIAL TO MEET THE SMS

Clusters that contained sufficient suitable and potentially suitable habitat combined were not considered "taken" at the foraging partition level. Instead, minimization efforts will be conducted to improve the potentially suitable stands so that they are suitable, such as suppressing hardwood midstory and thinning overstory hardwoods and/ or pines $\leq$ 10 in. dbh.









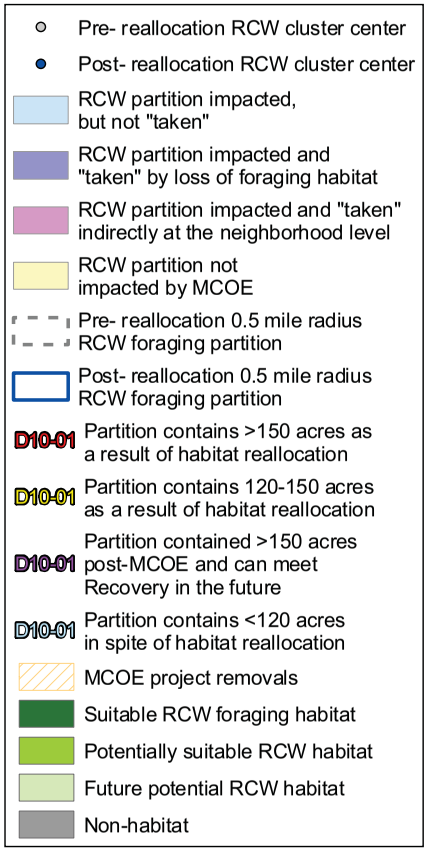
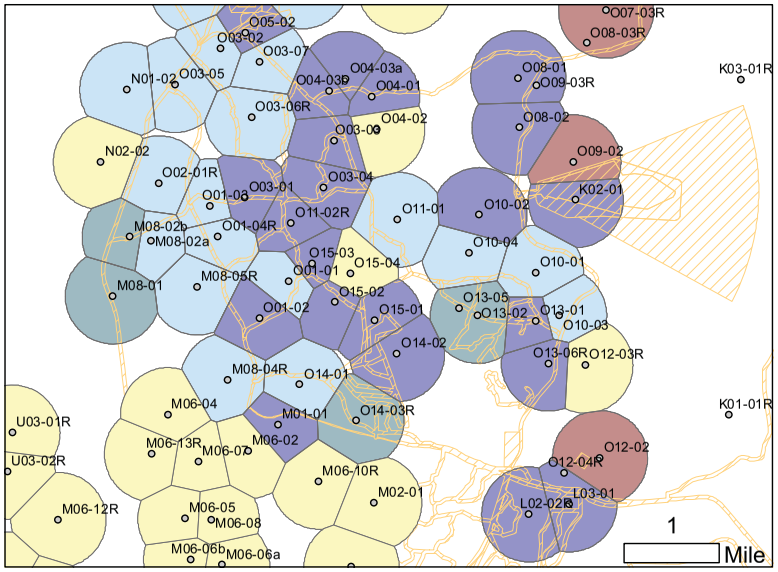
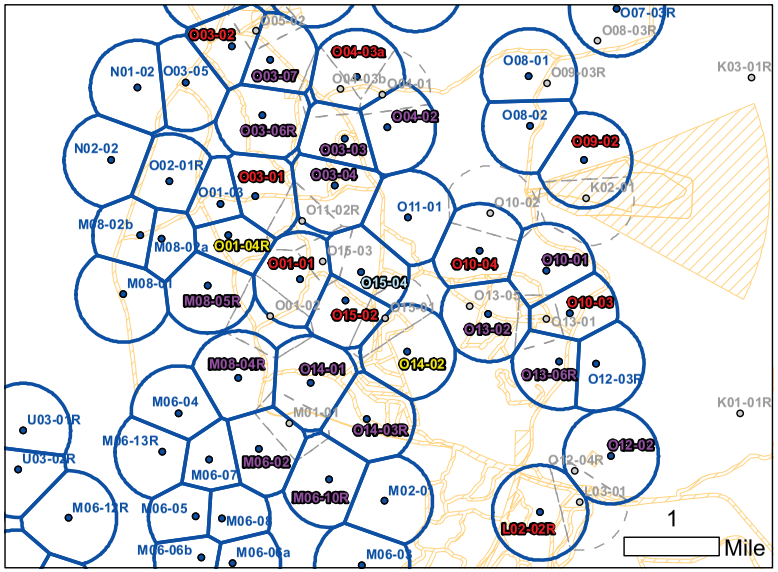


Figure 9-1. Red-cockaded woodpecker (RCW) foraging partitions impacted by the Southern Maneuver Area (SMA) where habitat was reallocated in order to minimize "take" and maximize manageable acreage for remaining partitions, Alternative A (Preferred Alternative) Maneuver Center of Excellence, (MCOE), Fort Benning, Georgia. Partitions that contained > 150 acres post-MCOE can meet Recovery in the future and were not deleted or minimized.



Partition locations prior to habitat reallocation



Partition locations after habitat reallocation

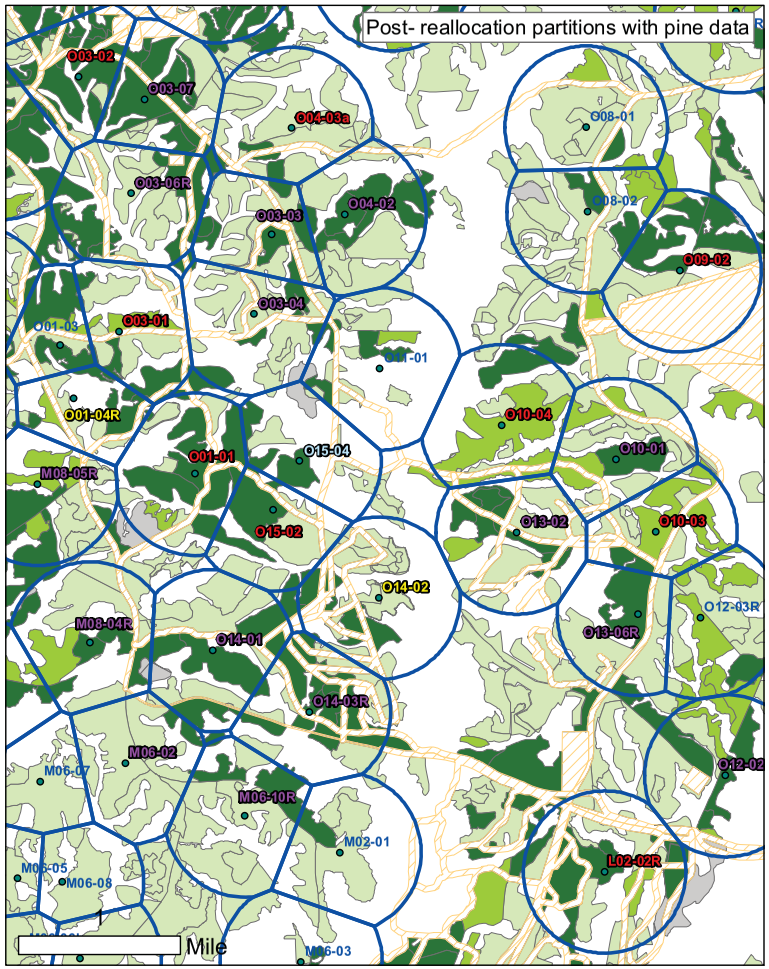
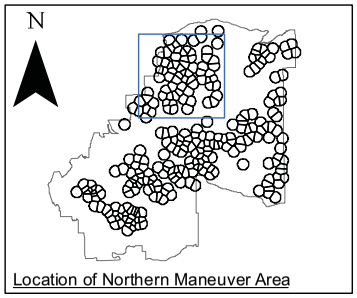


Figure 9-2. Red-cockaded woodpecker (RCW) foraging partitions impacted by the Northern Maneuver Area where habitat was reallocated in order to minimize "take" and maximize manageable acreage for remaining partitions, Alternative A (Preferred Alternative) Maneuver Center of Excellence, (MCOE), Fort Benning, Georgia. Partitions that contained > 150 acres post- MCOE can meet Recovery in the future and were not deleted or minimized.



Pre- reallocation RCW cluster center

Post- reallocation RCW cluster center

RCW partition impacted, but not "taken"

RCW partition impacted and "taken" by loss of foraging habitat

RCW partition impacted and "taken" indirectly at the group level

RCW partition impacted and "taken" due to harrassment

RCW partition not impacted by MCOE

Pre- reallocation 0.5 mile radius RCW foraging partition

Post- reallocation 0.5 mile radius RCW foraging partition

D10-01 Partition contains >150 acres as a result of habitat reallocation

D10-01 Partition contains 120-150 acres as a result of habitat reallocation

D10-01 Partition contained >150 acres post-MCOE and can meet Recovery in the future

D10-01 Partition contains <120 acres in spite of habitat reallocation

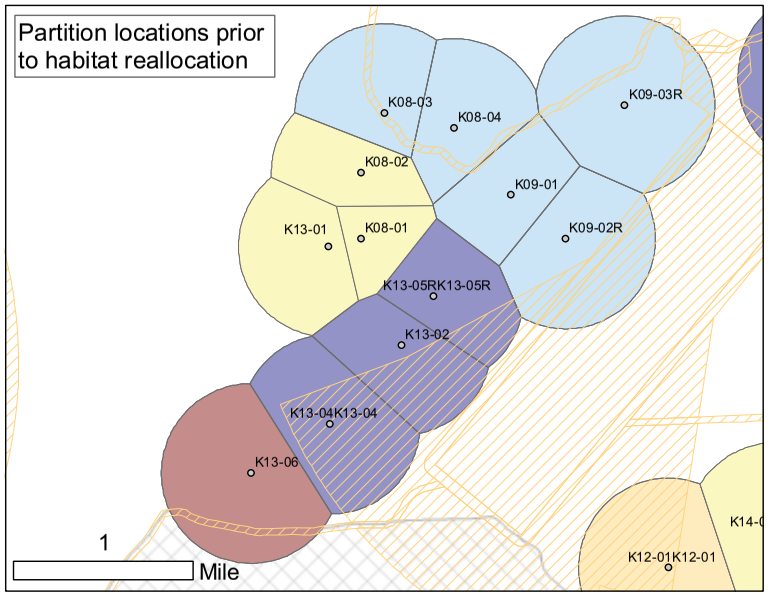
MCOE project removals

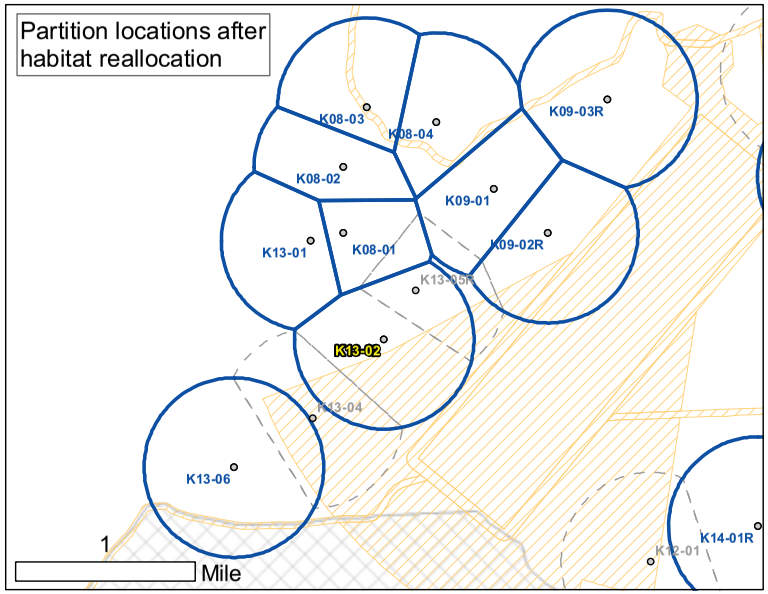
Suitable RCW foraging habitat

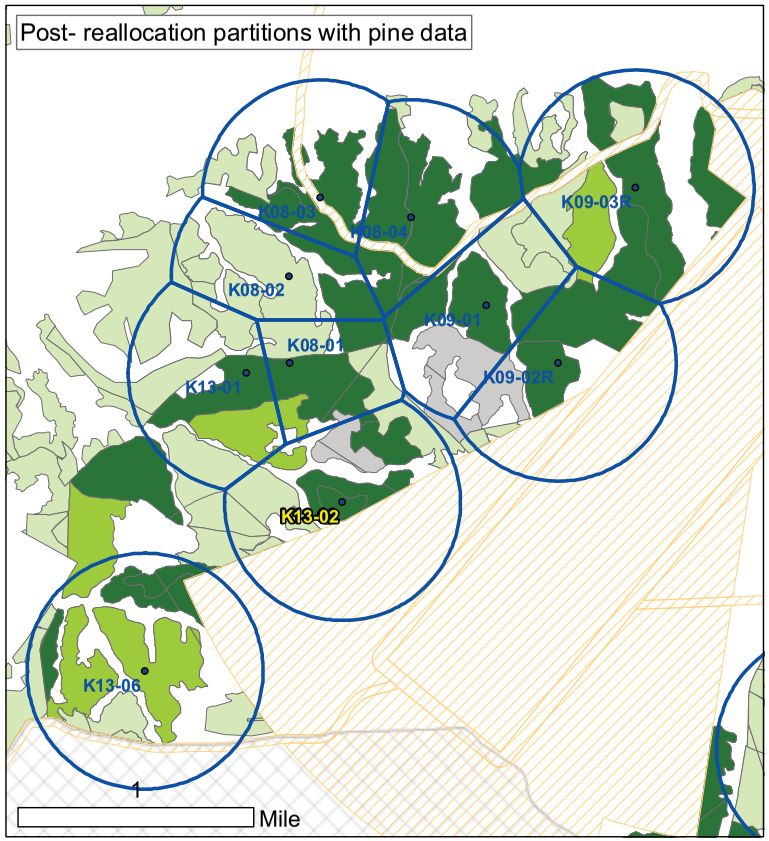
Potentially suitable RCW habitat

Future potential RCW habitat

Non-habitat







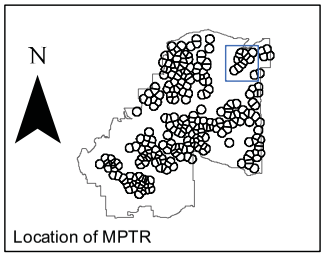


Figure 9-3. Red-cockaded woodpecker (RCW) foraging partitions impacted by the Multi-Purpose Training Range (MPTR) where habitat was reallocated in order to minimize "take" and maximize manageable acreage for remaining partitions, Alternative A (Preferred Alternative) Maneuver Center of Excellence, (MCOE), Fort Benning, Georgia. Partitions that contained > 150 acres post-MCOE can meet Recovery in the future and were not deleted or minimized.

- Pre- reallocation RCW cluster center
- Post- reallocation RCW cluster center
- RCW partition impacted, but not "taken"
- RCW partition impacted and "taken" by loss of foraging habitat
- RCW partition impacted and "taken" indirectly at the group level
- RCW partition impacted and "taken" due to cavity tree loss
- RCW partition not impacted by MCOE
- Pre- reallocation 0.5 mile radius RCW foraging partition
- Post- reallocation 0.5 mile radius RCW foraging partition
- D10-01 Partition contains 120-150 acres as a result of habitat reallocation
- MCOE project removals
- Suitable RCW foraging habitat
- Potentially suitable RCW habitat
- Future potential RCW habitat
- Non habitat
- Dudded Impact Area

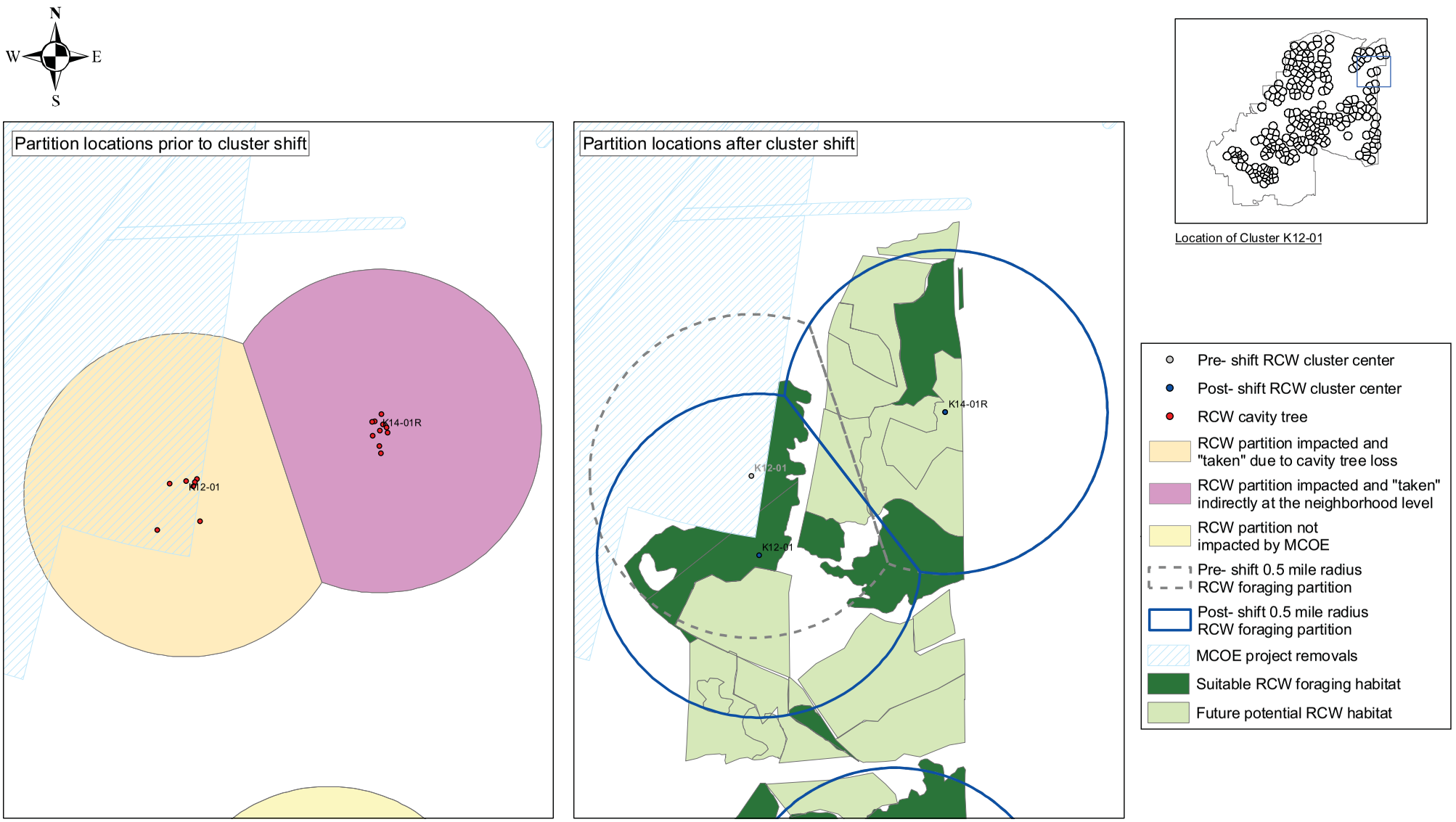


Figure 9-4. Red-cockaded woodpecker (RCW) foraging partition K12-01 impacted by the Beaten Area for the Multi-Purpose Training Range where the cluster can be shifted in order to minimize "take", Alternative A (Preferred Alternative) Maneuver Center of Excellence, (MCOE), Fort Benning, Georgia. Both clusters will contain >150 acres post-shift and can meet Recovery in the future.

Under Alternative A, there are a total of 26 impacted clusters that will only meet the foraging guidelines if "potentially suitable" habitat is improved. Of these, 7 are being "taken" at the group level by MCOE projects: A20-04, K13-06, O07-01R, O07-03R, O09-02, O12-02 and SHC-02. Two more are taken by harassment impacts: M08-02b and O13-02. The remaining clusters are A09-03R, A17-14a, BB05-01R, C01-03, C01-06, HCC-08R, KPR-01, M08-04R, N01-02, O01-04R, O02-01R, O10-01, O10-03, O10-04, O11-01, Q02-02, S01-01 (total of 17). At least six of these clusters are already being improved for Transformation projects: A09-03R, HCC-08R, O07-03R, O10-01, Q02-02 and SHC-02 (work already in progress). Habitat improvement in at least 3 clusters is complete.

Fort Benning will improve potentially suitable stands that were included in foraging habitat totals **in order to prevent "take."** Each stand requiring management will be visited by FBLMB personnel to determine a management strategy. Treatment methods will include harvest, where applicable, for merchantable timber removal (pine or hardwood) and herbicide applications (broadcast and hack/squirt) for non-merchantable hardwood control. Stands with a sparse overstory (generally ≤40 ft^2/ acres in pines ≥10 in. dbh) may then be underplanted with longleaf pine. Habitat improvement will be conducted prior to the initiation of clearing for the first project impacting the cluster in question. Where applicable, entire compartments will be reviewed for timber management prescriptions for efficiency purposes, but in other cases only identified stands will be treated. Where time constraints exist, only those portions of the identified stands that fall within the foraging partition will be improved or only the minimum improvement required to bring the cluster up to the SMS standards will be conducted prior to project initiation. When time permits, the remaining acreage will be improved. Although only stands ≥30 years old were counted towards foraging habitat in this document, stands ≥25 years were included in the list of stands for management, with the rationale that with management, these stands could be valuable foraging habitat during or soon after project construction.

For stands with too many pines <10 in. dbh, a judgment call will be made by FBLMB as to whether or not to thin, with guidance from USFWS. Retaining a BA of <20 ft^2/acre in pines <10 in. dbh as required by the SMS (USFWS 2003a) should be sufficient to replace the natural loss of overstory pines in a healthy forest with a BA of ≥40 ft^2/acre in pines ≥10 in. dbh. However, since overstory pine mortality in many stands on Fort Benning is higher than in similar habitats elsewhere due to forest decline and other factors (TNC 2006), and since stands were

counted toward RCW foraging totals in this assessment that have a lower BA in pines ≥10 in. dbh than that required by the SMS, more small pines may need to be retained. In particular, this will be an issue in declining off-site stands.

The efforts described above will minimize harm to RCWs by decreasing the loss of foraging habitat and increasing habitat quality and may contribute to increased cluster stability and group reproductive output (Section 6.8.3).

9.2.5. CONTINUED MANAGEMENT OF "TAKEN" CLUSTERS RELATIVE TO THE RS

Of the 78 clusters "taken" as a result of the proposed MCOE projects, 14 can still meet the RS in the future (150+ acres of habitat) and 7 may be able to meet RS in the future (120-150 acres of habitat).

None of these clusters (21) should be deleted from management. Continued management of these clusters/ partitions may result in the perpetuation or reformation of "taken" groups and allow these sites to be counted towards the Installation population goal. Fort Benning will also continue to monitor taken groups that do not have the potential to meet the RS in the future.

Continuing to protect and monitor the clusters that are "taken" by MCOE projects will allow Fort Benning to track the status of those clusters into the future. With USFWS approval, clusters that fall below the SMS standards, but remain active for 5 years may be counted towards Fort Benning's recovery goal. Any RCWs clusters that remain active can play a role in increasing (or maintaining) cluster density and population health, maintenance of demographic connectivity and continue to contribute fledglings for overall population stability and growth (Section 6.8.3).

9.3. DEMOGRAPHIC MONITORING AT AFFECTED RCW CLUSTERS

Expected monitoring requirements are listed below, however, additional requirements may be necessary pending the outcome of consultation with USFWS.

In the *Red-cockaded Woodpecker Demographic Monitoring Plan* (Transformation Monitoring Plan) (Fort Benning 2008b, Appendix C), Fort Benning agreed to monitor all clusters directly impacted by any project and all clusters with cavity trees within 200 ft. of road projects and/or within 0.5 mile of any proposed Transformation project that is removing RCW habitat.

This includes all "taken" clusters. Monitoring includes banding of all adult and nestling RCWs in the cluster and will be conducted for 5 years after project completion and/ or training initiation. Clusters requiring translocation as a result of cavity tree removal will have all birds banded prior to translocation (Fort Benning 2008b).

The Transformation Monitoring Plan will be updated or a similar plan will be developed to incorporate additional monitoring requirements from the proposed MCOE actions.

In addition, Fort Benning will explore the possibility of conducting 100% monitoring of its entire RCW population utilizing existing personnel in a fully staffed department. This monitoring will include an effort to band all nestlings in the A1, A2, A4 and A18 training compartments, however, access limitations due to range SDZs may prevent monitoring of some of the clusters within these compartments. Other areas that have similar access limitations include compartments located under the SDZs for the Oscar complex and Stationary Tank ranges (pers. comm. M. Barron). At this time, due to safety hazards and access limitations, no attempt will be made to band any groups within the A20 Impact Area.

Demographic monitoring will allow Fort Benning to detect and react to unexpected impacts to RCWs from project construction and operation. Each monitored cluster will be visited by a biologist several times a year. This field time will allow the biologist to track the status and health of RCW groups and cavity trees/ clusters. If this monitoring identifies unexpected and detrimental impacts, Fort Benning will consult immediately with the USFWS to determine the appropriate course of action.

9.4. HABITAT MONITORING AT AFFECTED RCW CLUSTERS

Fort Benning plans to establish vegetation monitoring plots within a 0.5 mile radius of the Southern Maneuver Area and downrange of the MPMG and the Oscar small arms range complex, and other ranges as necessary using methodology established with the DMPRC vegetation monitoring plots. This habitat monitoring will be conducted for at least 5 years after project completion. These data will document the effect of heavy maneuver training, down-range munitions and small arms range impacts on vegetation. Data collected from habitat monitoring will not only validate assumptions made in this document (such as the placement of habitat protection berms), but will also aid in future range and maneuver area impact

assessments. Details of the habitat monitoring will be provided in the Habitat Impact Assessment Plan that will be completed by July 2009.

Habitat monitoring will allow Fort Benning to detect and react to unexpected impacts to RCW habitat from project construction and operation. If this monitoring and analysis identifies unexpected and detrimental impacts, Fort Benning will consult immediately with the USFWS in order to determine the appropriate course of action.

9.5. COMPLIANCE MONITORING

Higher mission loads and more personnel who will be unfamiliar with training on a landscape with endangered species will necessitate an increase in monitoring efforts in order to make sure that all personnel using/training on Fort Benning are complying with the training restrictions detailed in the Army RCW Guidelines (DA 1996, 2007). Fort Benning currently has a limited number of personnel who check training areas weekly to ensure compliance. Data collected since 2003 have documented only 3 violations. At least 2 other violations were reported by FBCB personnel during regular cluster inspections/monitoring. In order to ensure that new troops are training within the guidance, inspections will need to be increased, at least initially. Inspections will involve visiting clusters in training compartments scheduled in Range Facility Management Support System (RFMSS) for use that day. Inspections will document troop presence and adherence to the guidelines and if violations are noted, troops will be asked to correct their actions and repair any damage. Reports will be submitted to FBCB and reports for violations will also be submitted to FBRD. Violations noted when no troop presence was detected will also be submitted to FBRD for corrective measures.

Fort Benning has requested funding for 1 person in FY09 and 3 persons in FY10 who would assist with increased compliance monitoring as well as other additional monitoring requirements.

9.6. TRANSLOCATION

The RCW Translocation Plan for Transformation (Fort Benning 2007a, Appendix B) will be updated or a new Plan will be written to incorporate needs stemming from the proposed action. Up to 15 RCW groups will need to be translocated because cavity trees will be removed. Fort Benning will consult with the USFWS to determine where those RCWs should be relocated.

If intrapopulation translocation is preferred (depending on habitat availability and distance from the impacted cluster to the recruitment cluster), FBLMB and FBCB will ensure that the recipient clusters are in the best condition possible via thinning, hardwood midstory control and/ or cavity installation and maintenance. Necessary stand improvements will be completed prior to the translocation event.

Groups may also need to be translocated from clusters within maneuver heavy use areas and range beaten areas. FBCB will consult with USFWS if monitoring indicates that translocation is necessary.

Studies have shown that the chances of RCWs returning to their "home" cluster greatly increase as the distance from their home cluster decreases (Carrie et al. 1996, Franzreb 1999, USFWS 2003a). For instance, Franzreb (1999) had a 25% success rate of translocations of adult and hatching-year RCWs moved <4.34 miles, compared to 71.4% success for birds moved 11.8-14.3 miles. Fort Benning has received guidance from the USFWS that adult RCWs must be moved a minimum distance of 10 miles USFWS (USFWS 2007a, R. Costa, USFWS and K. Witter, pers. comm.). Additionally, in translocation studies, success rates have been significantly higher when multiple potential pairs are moved simultaneously (USFWS 2003a). Fort Benning will continue to document the success or failure of intrapopulation translocations, and will work with the USFWS to determine a specific strategy for each cluster requiring translocation.

According to the Recovery Plan, translocations can be performed from 15 September to 1 January for subadults (USFWS 2003a). For established groups of RCWs (consisting of adults and potentially helpers and/or subadults), however, the USFWS suggested in more recent guidance (USFWS 2007c) and in the terms and conditions of the Transformation BO (USFWS 2007a) that adult groups should be translocated in the spring, just prior to the nesting season (last week of March through the first week of April). FBCB will therefore need to be made aware of all projects that require cutting of active cavity trees for each FY in order to schedule all necessary translocations. Although exceptions can be made on a case-by-case basis by the USFWS RCW Recovery Coordinator, it is ideal for the translocations to occur within the recommended time frame, both for the success of the translocation and, should the birds be taken to RCW populations off-Post, to coincide with the schedules of other organizations (USFWS 2003a). Fort Benning will work with USFWS to determine if recruitment sites on the installation are suitable for translocation (habitat quality and distance from impacted clusters).

Construction and timber clearing schedules will dictate when RCW groups will be translocated. Based solely on the number clusters being "taken" due to cavity tree loss each year (Table 6-10), Fort Benning will need to translocate up to 5 RCW groups (Clusters D11-02, J02-02, K02-01, O03-01 and O03-03) in 2009, 1 group (O04-03b) in 2010, 9 groups (A17-01, A17-02, A17-03, A17-06, A17-08, A17-11R, A17-13, K12-01 and K13-04) in 2011 and 0 groups in 2012. Fort Benning will work with USFWS to determine if recruitment sites on the installation are suitable for translocation (habitat quality and distance from impacted clusters).

If RCWs need to be translocated off-Post, they may be used to supplement a smaller population nearby so that as young pine stands on Fort Benning become suitable habitat, the recipient population can in turn become a donor population for the Installation (R. Costa, USFWS, pers. comm.).

Consultation with USFWS will determine whether Fort Benning will continue to be a donor population for the USFWS SRTC. If so, a combination of factors will continue to be used to determine which clusters will donate hatching-year RCWs, including giving priority to those "taken" clusters expected to lose most or all of their cavity trees, those with the least remaining habitat or clusters that are most likely to become inactive. Also, through the BO for the Land Exchange, the Installation is allowed to translocate juvenile RCWs from "taken" Cluster N02-01 on the MTP (ICF Kaiser Engineers, Inc. et al. 1999) However, these birds are not currently being banded.

9.7. BERMING OF SMALL ARMS RANGES

As Transformation and MCOE small arms ranges have reached 60 to 100% design, FBRD has conducted LOS analyses to determine which forested areas may be impacted by ordnance. The impacted forested area located down-range of a range footprint is referred to as the "beaten area." By examining the location and extent of the beaten areas in relation to RCW habitat with GIS, the FBCB and FBRD are able to evaluate the need for berms. In June 2008, Fort Benning initiated a request for funding exceeding $8.1 million dollars to cover environmental berm construction costs for any small arms ranges that were anticipated to have considerable down-range impacts to RCW habitat. Significant impacts include those impacts that adversely affect RCW habitat for range-impacted clusters which, if minimized, would add to the RCWs ability to recover, habitat that could be used for future allocation to an additional

cluster/ partition that could count towards the Installation's recovery goal, habitat that could provide connectivity to stands that met the other criteria or impacts to cavity trees.

Since the Transformation Biological Assessment, the methodology used to calculate the beaten areas has been improved. These improvements can be attributed to; the delivery of LIDAR remote sensing data with 1-foot contour resolution an improved Range Manager Tool-Kit (Automated Surface Danger Zone Plotting) and 3-dimensional line of sight capabilities (see Appendix E). As a result, all LOS analyses conducted for Transformation ranges have been reanalyzed using 100% designs as they become available.

Berms were included in the original designs for ranges FM1 (PN 65032) and MRF2 (PN 65044). The beaten area for the eastern half of MRF4 (PN 65046) was found to be significantly impacting habitat for Cluster O06-01 and currently has a partial toe berm included in the design to protect the down-range habitat. The beaten areas estimated for MRF3 (PN 65045) and MRF6 (PN 65048) were found to be insignificant and the LOS analyses suggests that there is sufficient natural topography to stop down-range impacts. Therefore, these ranges will have no berms included in the designs. The other 3 Transformation ranges that will have the LOS analyses reevaluated include MRF5 (PN 65047), Z3 (PN 65037), and Z4 (PN 65038).

The current LOS analysis for Z1 (PN 65035) using 60% design data suggests that sufficient natural topography exists to stop down-range impacts to RCW habitat in Cluster O05-03R and will not require a berm. The current LOS analysis for Z2 (PN 65036) using 60% design data suggests that no natural topography exists that will protect down-range RCW habitat. Although a berm has been included in the range design, a decision to berm this range will be made pending the results of the LOS analysis for the adjacent MRF7 (PN 65049 - 60% design). Minimization of down-range impacts to habitat behind these 2 ranges could potentially prevent the take of Cluster O05-02. The decision to berm the remaining MCOE small arms ranges including FM2 (PN 65033), MRF1 (PN 65043), MRF7 (PN 65049), Z5 (PN 65039) and FM3 (PN 65034) are pending the results of LOS analyses. Fort Benning will continue to evaluate berming options as Transformation and MCOE ranges approach 100% design and all LOS analyses are completed.

9.8. REMOTE MONITORING UTILIZING UNMANNED AIRCRAFT

FBCB has initiated dialogue with the Maneuver Battle Lab (MBL) at Fort Benning on the concept of utilizing unmanned aircraft (fixed wing or rotary wing) in order to monitor RCWs and RCW habitat with emphasis in the impact areas. The basic concept is to use a small plane or helicopter as a platform with appropriate sensing equipment (video, acoustical, infrared) and fly the aircraft to specific coordinates to monitor a cavity tree. If a helicopter is used, it could hover near a cavity tree, for example, during the nesting season and record RCW nesting behavior thus verifying that breeding is occurring. With high-quality optics, it is possible that aircraft could stay a considerable distance away from cavity trees, minimizing stress to the birds. An aircraft also could be controlled or programmed to fly a pattern over an area looking for RCW cavity trees and a biologist could see in real time what the aircraft is viewing on a monitor. If a cavity tree is seen, the GPS coordinates could be recorded.

The MBL is a unique organization that supports the Army's Vision and Transformation goals by conducting live, virtual, and constructive experiments that are based on rigorous analytics and Soldier inputs.

The MBL has expressed interest in this idea and in concert with a contractor is willing to work with CB to develop this capability. This effort will be focused on monitoring the RCW, but there could be spinoffs from this technology that could be used for many natural resources activities such as monitoring gopher tortoise burrows, assessing many types of habitat, censusing deer and feral pig populations, monitoring for environmental compliance during a field exercise, evaluating effectiveness and coverage of a prescribed burn, locating and determining erosion footprints, etc. There is the opportunity that during the development of these techniques, there will be application to military needs and requirements. Much of the basic technology already exists, it just needs to be adapted to practical use by biologists and technicians. Ft. Benning has requested 200K from Installation Management Command, Southeast Region for FY 09 to kickoff this collaboration and plans to continue this project for approximately 5 years.

Because the potential effects of this technique to RCWs are unknown, this proposal would be taken in stages with appropriate consultation with USFWS and GA DNR, and only after any applicable permits or authorizations are obtained.

9.9. DUDDED IMPACT AREAS

As part of the minimization effort for the DMPRC, Fort Benning arranged to manage 11 clusters in the north central portion of the A20 impact area (USFWS 2004, 2006c, Fort Benning 2005). FBCB is able to access these clusters 4 days per year per an agreement with FBRD, including at least 1 visit during the nesting season to document breeding status.

The remaining portion of the A20 Impact Area is known to contain several other RCW clusters which may be added to management as a minimization strategy. On 14 September 2008, Fort Benning personnel traversed the A20 Impact Area from east to west along an abandoned trail (Yankee Road). Although the purpose of the initial reconnaissance trip was to determine if there was access to RCW clusters in the southern portion of the Impact Area, personnel were able to confirm the presence of several RCW clusters (formal surveys were not conducted). It was estimated that, with work, there could be access to approximately 10 RCW clusters adjacent to the Yankee Road trail. Additional reconnaissance trips in the impact area are planned and it is thought that up to 10 more RCW clusters could be accessible (up to 20 total). RCW clusters which are found to be accessible and can be monitored and managed could potentially be counted towards the Fort Benning RCW recovery goal. In addition, the pine acreage associated with these clusters could be counted towards the acreage needed to meet Fort Benning's 351 PBGs Recovery Goal. Fort Benning will continue to assess A20 Impact Area for clusters and habitat as soon as possible. If safety/ logistics will support monitoring of clusters, then Army approval will be needed to monitor/ protect selected clusters and habitat. Once approved, Fort Benning will consult with USFWS to include clusters and habitat towards recovery.

The major obstacle in the Impact Area is human safety. Numerous residual and unexploded ordnances were encountered throughout the reconnaissance area. Fort Benning recently contracted Explosive Ordnance personnel from the Huntsville USACE to conduct a detailed surface munitions sweep of portions of the Impact Area.

Currently, there are no navigable roads through several large drains within the Impact Area and considerable investment will need to be made in order traverse the streams. In addition, a "safe lane" would have to be established and the surface cleared of ordnance each time access to the RCW clusters is required. A portion of the Huntsville USACE contract is to be used for construction of roads in the A20 Impact Area.

Fort Benning recently received a proposal for an aerial survey of the A20 Impact Area for RCW cavity trees. During an aerial survey, GPS coordinates could be obtained for new and known cavity trees. The status (active / inactive, start/ cavity) of the cavity trees can be recorded with a high degree of accuracy. Funding is currently being sought.

9.10. PROPOSED HABITAT CONSERVATION OUTSIDE OF FORT BENNING TO OFFSET THE IMPACTS OF THE PROPOSED ACTION ON THE RCW

The Army has proposed 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. To offset adverse effects that cannot be avoided, the Army is also proposing to implement conservation measures to provide for recovery of the RCW within the Sandhills Recovery Unit on lands outside of Fort Benning, including private land. The primary purpose of these conservation actions is to conserve in perpetuity lands in the vicinity of Fort Benning that have potential RCW 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 on private lands; restrict use of such lands for incompatible purposes; require the affirmative maintenance, creation and/or restoration of potential habitat to a desired future condition. These measures are described in more detail below. 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 conservation easements over private lands for the conservation of private lands containing habitat for threatened, endangered and sensitive species. The ACUB program will serve as the primary tool to achieve the off-post conservation actions. The Army will 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 of completion of formal consultation on the proposed action.

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 for the proposed action, develop

an off-post habitat conservation plan (hereinafter "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 landowners.

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 to 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 easements and implementation of parcel-specific management plans with an initial target of not less than $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 program and seek funding of its ACUB program for future fiscal years.

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. The Army will provide an assessment of the effects of implementing the plan. Over the planning horizon, the Army will provide a projected time-line for near-term, mid-term, and long-term conservation easement acquisition and habitat management actions; predict the likely acreage to be protected and its condition; and provide a determination 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.

9.11. MINIMIZATION UNDER CONSIDERATION BUT NOT PROPOSED

9.11.1. RECRUITMENT CLUSTERS

Typically, when projects result in a "take," the overall impact on the population is "minimized" by creating recruitment clusters either on the same property or off-property within the affected population. However, a large number of recruitment sites were installed on Fort Benning in the late 1990s to 2000, which have resulted in a high proportion of inactive clusters on the Installation (9.5% of all managed clusters in 2008). Also, there are currently no available off-property RCWs that are considered to be part of the Fort Benning population where creation of recruitment sites could be considered "minimization."

The Recovery Plan (USFWS 2003a) and Army RCW Guidelines (DA 1996, 2007) recommend a 5% average annual population growth in all RCW populations to be achieved by providing a number of unoccupied recruitment clusters equal to 10% of the total number of active clusters (USFWS 2003a, DA 2007). Fort Benning currently has 18 unoccupied recruitment clusters with 4 suitable cavities each, which is 6.5% of the number of active clusters on the Installation. Potential locations for additional recruitment sites are limited due to poor

habitat conditions and other issues, such as the distance of new recruitment clusters relative to existing active clusters. Between 2007 and 2008, active RCW clusters increased 2.53 % and the number of PBGs increased 3.44 % within the Fort Benning RCW population. Under the Army RCW Guidelines (DA 1996, DA 2007), Fort Benning must informally consult with the USFWS if this growth rate is not maintained. Even without the Transformation and MCOE actions, pine decline issues on Fort Benning will challenge continued RCW growth on Fort Benning.

10.CONCLUSIONS

The proposed 2009-2012 MCOE projects will have no effect on Michaux's sumac, purple bankclimber, shiny-rayed pocketbook, gulf moccasinshell, oval pigtoe, American alligator or wood stork. In addition, there will be no destruction or adverse modification of designated Critical Habitat for the shiny-rayed pocketbook mussel. The proposed action is likely to adversely affect relict trillium and the RCW (Table 10-1).

Potential direct impacts to relict trillium include damage to, and destruction of, plants in the Randall Creek North trillium population by clearing and construction of a proposed new security fence, road and bridge (Table 10-1). Affected plants may be relocated to a recipient site on Fort Benning or to a site on GA DNR property in order to establish or enhance off-Post relict trillium populations.

The ecosystem at Fort Benning is currently stressed, as land managers transition the forests from a fire-suppressed, loblolly pine-dominated system to a frequently burned, longleaf pine-dominated system. The proposed action will exacerbate the forest decline situation at Fort Benning and there may be a major loss of active RCW clusters. Sufficient contiguous pine acreage will likely remain post-project under either alternative for the Installation to meet its population recovery goal in the future. Based upon current information, the population may be able to survive until reaching recovery.

Alternative A projects will be impacted due to fragmentation and the reduction of RCW cluster densities.

RCW cavity trees and/ or foraging habitat will be impacted in 121 active and 12 inactive RCW clusters as a result of 2009-2012 MCOE projects, Alternative A. In 2008, 119 of the active clusters contained PBGs, one had a solitary male and one was a captured site (Table 6-5).

FHAs were completed for 120 active clusters (project impacts to 1 active cluster were in non-contiguous habitat and an FHA was not conducted). Pre-project, 36 of the 120 analyzed active clusters (3%) did not meet the SMS and 118 clusters (98%) did not meet RS. Data for pre- project cluster status and foraging habitat are presented in Tables 6-3 and 6-4, Figures 6-5 - 6-15 and Appendices G, H, and I.

Table 10-1. Proposed Maneuver Center of Excellence actions at Fort Benning and potential effects to Federally-listed species.

Project Number	Project Title	Analyzed for Transformation (Y/N)	Fiscal Year-(Start Date)	Maximum Acres of Pine Impacted	Location	Federally-listed species impacted (directly or indirectly)
62953	Rail Loading Facility Expansion	Y	12	28.05	Harmony Church	RCW
64797	Driver Training Course	Y	09	9.43	Harmony Church	RCW
65034	Fire and Movement Range 3 (FM3)	Y	10	50.47	Oscar Small Arms	RCW
65035	Basic 10M-25M Firing Range 1 (Z1)	Y	09	23.32	Oscar Small Arms	RCW
65036	Basic 10M-25M Firing Range 2 (Z2)	Y	09	28.30	Oscar Small Arms	RCW
65039	Basic 10M-25M Firing Range 5 (Z5)	Y	09	19.12	Oscar Small Arms	RCW
65070	Multipurpose Machine Gun Range 2 (MPMG2)	Y	11	482.73	Southern ranges	RCW
65246	Recreation Centers	Y	12	3.01	Harmony Church, Sand Hill	RCW***
65248	Physical Fitness Center, Harmony Church	Y	12	0.76	Harmony Church	RCW
65383	Stationary Tank Range (ST2)	Y	09	562.63	Northern ranges	RCW
65554	Construct Training Area Roads Paved	Y	09	580.16	Throughout	Relict Trillium, RCW
65557	Repair Existing Training Area Roads, Phase 1	Y	10	720.76	Throughout	RCW
69358	Range Access Road - Good Hope Maneuver Training Area	(Y)	09	99.50	Good Hope	RCW
69668	Good Hope Training Area Infrastructure	*Y	09	4,661.58	Good Hope	RCW
69741	19D/K OSUT Training Area Infrastructure	(Y)	09	623.96	Northern ranges	RCW
69743	Southern Training Area Infrastructure	*Y	09	3,035.86	Northern ranges	RCW
70235/ 65081/ 67461	Hospital Replacement	*Y	**08	2.75	Main Post	N/A
72017	Vehicle Recovery Course (Ground Mobility Division)	*Y	09	277.26	Harmony Church	RCW
64551	Multipurpose Training Range (MPTR)	N	09	875.88	Northern ranges	RCW
65033	Fire and Movement Range (FM2)	N	09	89.07	Oscar Small Arms Complex	RCW
65043	Modified Record Fire Range (MRF 1)	N	09	58.88	Oscar Small Arms	RCW
65049	Modified Record Fire Range (MRF 7)	N	09	79.53	Oscar Small Arms	RCW
65078	Anti-Armor Tracking & Live Fire Complex (LA-AR1)	N	09	42.95	Southern ranges	RCW
65250	Maneuver Battle Lab	N	10	0.00	Main Post	N/A
67457	Infrastructure Support, Incr 2. Includes security fence and direct buried cable	N	09	56.81	Northern ranges and Harmony Church	Relict Trillium, RCW

*Y Project analyzed under a different PN or no PN in Transformation Biological Assessment
(Y) Project combined with other PNs in Transformation Biological Assessment
** Project funded in FY08, however, construction will be≥ FY 09
*** Only a portion of this project will impact any pine habitat

Table 10-1 (cont.). Proposed Maneuver Center of Excellence actions at Fort Benning and potential effects to Federally-listed species.

Project Number	Project Title	Analyzed for Transformation (Y/N)	Fiscal Year-(Start Date)	Maximum Acres of Pine Impacted	Location	Federally-listed species impacted (directly or indirectly)
69147	Trainee Complex Upgrade	N	09	4.13	Sand Hill	RCW
69150	Classrooms & Dual Battalion Dining Facility	N	10	0.60	Sand Hill	RCW
69151	Dining Facilty to Support AST Training	N	10	0.00	Main Post	N/A
69406	Unit Maintenance Facilities	N	09	1.89	Main Post	RCW***
69742	Northern Training Area Infrastructure	N	09	175.04	Northern ranges	RCW
69745/ 72322/ 72324	Training Barracks Complex, Phases 1, 2 and 3	N	10, 11 and 12	71.19	Sand Hill	RCW***
69999	Warrior in Transition Complex	N	09	0.00	Main Post	N/A
70026/ 72456	Classrooms with Battalion Dining Facilities, Phases 1 and 2	N	10, 11	0.00	Sand Hill	N/A
70027/ 72457	Classrooms with Battalion Dining Facilities, Phases 1 and 2	N	10, 11	4.05	Sand Hill	RCW***
71065	Troop Store - AAFES (NAF)	N	09	0.00	Harmony Church	N/A
71473	Water Treatment Plant Upgrade and Expansion	N	10	0.00	Main Post	N/A
71620	Dental Clinic Addition	N	10	0.00	Main Post	N/A

*Y Project analyzed under a different PN or no PN in Transformation Biological Assessment
(Y) Project combined with other PNs in Transformation Biological Assessment
** Project funded in FY08, however, construction will be≥ FY 09
*** Only a portion of this project will impact any pine habitat

Post- project under Alternative A, 55 of the 120 active clusters (46%) did not meet the SMS (Table 6-3) and will be directly "taken" by loss of forage and/or cavity tree impacts from the proposed projects. One additional cluster will be "taken" only because of cavity tree removals. An additional 5 clusters will be "taken" due to harassment impacts, 8 clusters will be "taken" at the group level and 9 will be "taken" at the neighborhood level. Therefore 78 of the 120 impacted clusters (65%) will be "taken" as a result of the proposed MCOE actions. Transformation projects resulting in 10 "takes" were not reanalyzed and these "takes" must be added to the total impacts from this MCOE action 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 combined Transformation and proposed MCOE actions is 88.

One hundred and nineteen clusters (99%) did not meet the RS post- project and of these, 8 impacted (but not "taken") clusters will have less than 120 acres of manageable habitat and will be unable to meet the RS in the future (Table 6-15). Eighteen other impacted clusters will have between 120 and 150 acres of habitat and may or may not be able to meet the RS depending on local site conditions and management regime.

Post-project, approximately 66,392 acres of pine habitat will remain, of which approximately 19,915 acres will be in loblolly or shortleaf pine stands with a high risk of decline. Pine acreage remaining post-project could potentially support 421 clusters at 158 acres/ cluster, or 443 clusters at 150 acres/ cluster. However, if the loss of habitat due to the MPTR range is never recovered, the contiguous acreage remaining post-project (63,303) would support 422 clusters with 150 acres each, slightly above the number of clusters Fort Benning must manage to meet its Recovery Goal.

To prepare a thorough and comprehensive analysis, Fort Benning has combined the reinitiation of consultation on substantially changed Transformation actions with consultation on the associated "new" projects in this MCOE Biological Assessment. Fort Benning will continue implementation of the projects evaluated in the Transformation BO (USFWS 2007a) that were not reanalyzed in this MCOE Biological Assessment (Table 10-1). If, in the future, either those Transformation projects or the MCOE projects are expected to have different impacts to Federally listed species than analyzed, Fort Benning will reinitiate consultation with USFWS.

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14.ACRONYMS/ ABBREVIATIONS

1

%- percent
3rd ID - 3rd Infantry Division
ACF Basin - Apalachicola-Chattahoochee-Flint River Basin
AE - Architect and Engineer firm
AL - Alabama
AMF - Army Modular Force
ANCOC - Advanced Noncommissioned Officer Course
AP3 - Army Power Projection Platform
AR - Army Regulation
ARC - Army Reconnaissance Course
Army RCW Guidelines - 1996 and 2007 Army RCW Guidelines
BA - Basal Area
BCT - Basic Combat Team
BCT - Brigade Combat Team
Bde - Brigade
BFV - Bradley Fighting Vehicle
BMP - Best Management Practices
Bn - Battalion
BNCOC - Basic Noncommissioned Officer Course
BO - Biological Opinion
BOLC - Basic Officer Leader Course
BRAC - Base Realignment and Closure
CACTF - Combined Arms Collective Training Facility
CFR - Code of Federal Regulation
CID - Criminal Investigation Division
CP/MPQC - Automated Combat Pistol/ MP Firearm Qualification Complex
DA - Department of the Army
dbh - diameter at breast height
DENTAC - Dental Activity
DMPRC - Digital Multi-Purpose Training Range Complex
DoD - US Department of Defense
DPW - Directorate of Public Works
DS/ GS - Direct Support/General Support
EA - Environmental Assessment
EIS - Environmental Impact Statement
EMD - Environmental Management Division
ENG - Engineer
ESA - Endangered Species Act
ESMC - Endangered Species Management Component
ESMP- Endangered Species Management Plan
ESRI - Environmental Systems Research Institute®
FB - Fort Benning
FB Form 144-R - Fort Benning "Request for Environmental Analysis"
FBCB - Fort Benning Conservation Branch
FBLMB - Fort Benning Land Management Branch
FBRD – Fort Benning Range Division
FEIS - Final Environmental Impact Statement
FHA - Foraging Habitat Analysis
FM - Fire and Movement range
FORSCOM - Forces Command
ft. - foot/feet
FTX - Field Training Exercise
FY - Fiscal Year
GA - Georgia
GA DNR - Georgia Department of Natural Resources
GDPR - Global Defense Posture Realignment
GIS - Geographical Information Systems
GPS - Global Positioning Systems
GWOT - Global War on Terrorism
GTA - Grow the Army
HBCT - Heavy Brigade Combat Team
HMMWV - High Mobility Multipurpose Wheeled Vehicle
IBCT – Infantry Brigade Combat Teams
ICEC - International Classification of Ecological Communities
ID - Infantry Division
ID/IQ - Indefinite Delivery/ Indefinite Quantity
IET - Initial Entry Training
in. - inches
Inc. - Incorporated
INRMP - Integrated Natural Resource Management Plan
IPBC - Infantry Platoon Battle Course
ISBC - Infantry Squad Battle Course
ITAM - Integrated Training Area Management
JBO - Jeopardy Biological Opinion
JCA - Dr. J. H. Carter III and Associates, Inc.
km^2 - square kilometers
KY - Kentucky

LA-AR - Anti-Armor Tracking & Live Fire Complex
Matrix- USFWS RCW Foraging Habitat Software
MOA - Memorandum of Agreement
MCOE - Maneuver Center of Excellence
Mech - Mechanized
MBL – Maneuver Battle Lab
MEDDAC - Medical Department Activity
MILCON - Military Construction
MOA - Memorandum of Agreement
MOU - Memorandum of Understanding
MOUT - Military Operations in Urban Terrain
MP - Military Police
MPMG - Multi-Purpose Machine Gun Range
MPTR - Multi-Purpose Training Range
MRF - Modified Record Fire range
MSL - Mean Sea Level
MTP – Muscogee Technology Park
NCO - Noncommissioned Officer
NCOA - Noncommissioned Officer Academy
NEPA - National Environmental Policy Act
NMFS - National Marine Fisheries Service
NPDES - National Pollution Discharge Elimination System
NRCS - Natural Resources Conservation Service
NVCS – National Vegetation Classification System
OSUT - One Station Unit Training
PBG - Potential Breeding Group of RCWs
PN - Project number
POI - Program of Instruction
POM - Program Objective Memorandum
POV - Privately Owned Vehicle
PRC - Primary Recruitment Cluster
PUAL - Pending Unit Action List
QTR - Qualification Training Range
Range Division - Fort Benning Range Division
RCW - Red-cockaded woodpecker
RD - Range Division
RDP - RTLP Development Plan
REA - Request for Environmental Analysis
REC - Record of Environmental Consideration
Regt - Regiment
REPI - Readiness and Environmental Protection Initiative
RFMSS - Range Facility Management Support System
RFP - Request for Proposal
ROD - Record of Decision
RPA - Reasonable and Prudent Alternative
RPM - Reasonable and Prudent Measures
RRC - Regional Readiness Command
RS - Recovery Standard
RTB - Ranger Training Brigade
RTLP - Range Training and Land Program
SAIC - Science Applications International Corporation
SBCT - Stryker Brigade Combat Team
SC – South Carolina
SCDNR - SC Department of Natural Resources
SDZ - Surface Danger Zone
SEMP - SERDP Ecosystem Management Project
SERDP - Strategic Environmental Research and Development Program
SERPPAS - Southeast Regional Partnership for Planning and Sustainability
SRP- Sustainable Range Program
ST - Stationary Tank Range
SMS - Standard for Managed Stability
SOCOM - Special Operations Command
SOF - Special Operations Forces
SRC - Supplemental Recruitment Cluster
SRTC - USFWS RCW Southern Range Translocation Cooperative
STX - Situational Training Exercise
TAA - Tactical Assembly Area
Take - Incidental Take
TNC - The Nature Conservancy
TRADOC - Training and Doctrine Command
UAV - Unmanned Aerial Vehicle
UEA - Unique Ecological Area
US - United States
USAAA - US Army Audit Agency
USAARMC/S - US Army Armor Center and School
USACE - US Army Corps of Engineers
USAEC - US Army Environmental Command
USAIC/S - US Army Infantry Center and School
USARC - US Army Reserve Center
USFS - US Forest Service
USFWS - US Fish and Wildlife Service
WHINSEC - Western Hemisphere Institute for Security Cooperation
Z - Rifle/ Machine Gun Zero range