Artillery Firing Point Expansions & Maintenance of the Open Field Training Environment

Environmental Assessment

Fort Benning, Georgia

Garrison, U.S. Army Maneuver Center of Excellence
Fort Benning, Georgia

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ARTILLERY FIRING POINT EXPANSIONS & MAINTENANCE OF THE OPEN FIELD TRAINING ENVIRONMENT ENVIRONMENTAL ASSESSMENT

FORT BENNING, GEORGIA

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1.0 PURPOSE, NEED, AND SCOPE

1.1 Introduction

Fort Benning has prepared this environmental assessment (EA) to examine the potential environmental effects of improvements to Field Artillery Training assets and maintenance activities to support training and operations. This EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); the regulations of the President's Council on Environmental Quality (CEQ); United States (U.S.) Department of the Army (Army) Regulation 200-1, and Army NEPA Regulation (32 Code of Federal Regulations (CFR) Part 651).

This EA focuses on improvements and long-term maintenance activities to current training assets primarily needed to support the missions and Programs of Instruction (POIs) of the Airborne and Ranger Training Brigade (ARTB), 75th Rangers, and the Field Artillery units of the Infantry School and the 1-28th Infantry Battalion Task Force (IBTF), as well as other tenant and/or visiting units' training requirements. These assets include Drop Zones (DZs), Helicopter Landing Zones/Pick-up Zones (HLZ/PZs), Observation Points (OPs), and Firing Points (FPs) for Mortars and Howitzer guns, and are generally referred to as the "open field training environment". Each training asset is discussed in more detail below. Improvements to these assets could include new construction of erosion and sedimentation control structures; disking, grading, and stabilizing areas to improve access for Soldiers and equipment; footprint expansions and new construction to accommodate military equipment configurations and training requirements; and removal of obstacles/hazards (e.g. trees and vegetation, road grading and stabilization, etc.), for approach/departure clear zones of HLZ/PZs, and DZs for aircraft, equipment, and Soldier safety.

This EA is a public document that will be used to determine and evaluate the potential environmental consequences of the Proposed Action, identify possible/potential mitigation measures to lessen or eliminate adverse effects, and examine reasonable alternatives to the Proposed Action. The intended audience of the EA is Army decision-makers; interested government agencies; and non-governmental organizations, Federally recognized Native American Tribes, and members of the public. The effects analyses in this EA are based on a variety of sources and the best available information at the time of preparation. The information contained in this EA will be reviewed and considered by the Army prior to a final decision on how to proceed with the implementation of the Proposed Action, if at all.

1.2 Background

Fort Benning is an Army Installation that was founded in 1918 and is located on approximately 182,000 acres in southwest Georgia in Chattahoochee and Muscogee counties, and in Russell County, Alabama. As the home of the Maneuver Center of Excellence (MCoE), Fort Benning plays a significant role in supporting the Army's mission and is an invaluable military readiness training platform by developing the capabilities of the maneuver force and individual Soldier. The Army's mission is to fight and win the nation's wars, respond to national security threats, and promote peace. The MCoE does this by providing trained, agile, and adaptive Soldiers and leaders ready to operate across the range of military operations from peacekeeping and security operations to high intensity military conflicts. To support the Army's mission, Fort Benning must possess the infrastructure and facilities necessary to support the military training occurring there and support the quality of life of the Soldiers and their Families.

As major combat operations have ceased in Iraq and Afghanistan, the Army has been developing new doctrines to address future conflicts, while identifying prudent measures to reduce spending without sacrificing operational capabilities. To achieve mandated spending reductions, the Army decided to

decrease the current total number of Soldiers and Army civilians, while reorganizing the current force structure. The Army studied options to implement the proposed force realignment and reduction, including conducting a Programmatic Environmental Assessment (PEA) in 2013 to consider the environmental and socioeconomic impacts (U.S. Army 2013). The 2013 PEA examined possible force structure changes at 21 installations, including Fort Benning.

At the time of the preparation of the PEA, Fort Benning was home to the 3rd Brigade of the 3rd Infantry Division (3rd ID) which was organized as an Armored Brigade Combat Team (ABCT). On 25 June 2013, the Army announced that 3rd ID would remain at Fort Benning, and later announced in 2014 that the 3rd ID would be converted from an ABCT to an Infantry Brigade Combat Team (IBCT). This conversion would result in considerable differences in equipment and training missions. In contrast to an ABCT, the IBCT does not use tracked vehicles for off-road heavy maneuvers, and conducts dismounted training with wheeled vehicles primarily on established roads and trails.

In 2015, in conjunction with two other actions, Fort Benning prepared the *Enhanced Training at Fort Benning, Georgia* EA to analyze the impacts of the 3rd ID's conversion from an ABCT to an IBCT. However, prior to the completion of a Finding of No Significant Impact (FNSI) for the 3rd ID's conversion to an IBCT, the Army announced on 9 July 2015 that Fort Benning would lose approximately 3,400 Soldiers. This reduction in force would then involve the conversion of the 3rd ID ABCT to an Infantry Battalion Task Force (IBTF) consisting of approximately 1,080 Soldiers rather than conversion to an IBCT of approximately 4,000 Soldiers. Therefore, the force structure at Fort Benning was transformed in FY16 with the deactivation of the 3rd ID ABCT and the subsequent activation of the 1-28th IBTF to meet Army Force Structure decisions.

At the time of these decisions, it was not entirely well-defined as to what type of maneuver and support units an IBTF would be comprised of, as well as vehicles and training requirements. Ultimately, the 1-28th IBTF became composed of Soldiers from the inactivated battalions that previously formed the 3rd ABCT, and consists of infantry squads, engineers, cavalry scouts, artillery, and support personnel (Wright 2016). Concurrent with these Army Force Structure decisions, new field artillery requirements were being developed with the modernization of the M119 and M777 Howitzer weapon systems to include Global Positioning System (GPS) hardware and software to improve navigation and digital communications for receiving firing data, as well as structural redesigns to reduce recoil and the overall weight to improve mobility.

At its most basic level, an artillery piece is a crew-served weapon that propels a relatively large projectile far beyond the range and power of Infantry's small arms. Artillery usually refers to shell-firing guns, howitzers, mortars, rockets, and guided missiles, but can also utilize non-lethal munitions such as smoke and illumination rounds to either obscure the enemy's visibility or aid ground operations that occur at night. The field artillery is organized into light, medium, and heavy artillery on the basis of weapon caliber.

Previously, the artillery components of the 3rd ID ABCT consisted of self-propelled M1064 Mortar carriers and Paladins (155mm Howitzer gun) that were highly mobile artillery pieces mounted on tracked vehicles. With the deactivation of the 3rd ID, the Paladin and M1064 Mortar carrier artillery weapon systems are no longer at Fort Benning. In contrast, current artillery weapon systems that support the mission of the 1-28 IBTF consist of light (M119A3) and medium (M777A2) howitzers that fire 105mm and 155mm caliber munitions (respectively), that are towable with high mobility multi-purpose wheeled vehicles (HMMWV), and can also be transported to firing positions with helicopters and fixed-wing aircraft. Mortars weapon systems of the 1-28th IBTF consist of 60mm (M224) and 81mm (M252) which could be hand carried in the field, and the 120mm (M120/121) which is heavier and requires transport via

a trailer towed by a HMMWV, or mounted onto an armored personnel carrier. Heavy artillery guns of 203mm or more in caliber, have not, and will not be used by field artillery units at Fort Benning.

This transition from tracked to towed artillery weapon systems was not captured in the *Enhanced Training* EA due to the Army's reconsideration of the force structure decisions post-document completion, as well as the uncertainty of the organization of supporting units (e.g. infantry, engineer, medical, etc.), that would comprise an IBTF, including the equipment required to accomplish their mission. Now that the organization, vehicles, and weapons systems to support the IBTF mission have been established, corresponding needs have been identified to support their training, specifically for the artillery components of the 1-28th as discussed in more detail below, as well as Section 1.3 (Purpose and Need) and Section 2.2 (Proposed Action).

Otherwise, the impacts identified in the *Enhanced Training* EA for the conversion of an ABCT to an IBCT is consistent with that of the final decision to convert to an IBTF. Similar to an IBCT, the 1-28th IBTF at Fort Benning has no tracked vehicles and does not perform off-road, heavy maneuver training, instead conducting dismounted training with light and medium wheeled vehicles with trailers primarily on established roads and trails as part of their mission. There have been no new needs identified to support dismounted training as it is similar in nature to other infantry tenant units currently training at Fort Benning. Additionally, the Army's force structure decisions did not affect the ARTB, 75th Rangers, or other tenant units stationed at Fort Benning, therefore, no new needs were identified to support their training mission.

Artillery Assets. The mission of field artillery is to destroy, neutralize, or suppress the enemy by indirect fire, and to help integrate all fire support assets (such as air, armor, and infantry), into a combined arms operation (DA 1996). Unlike other weaponry, artillery pieces fire munitions without reliance upon a direct line-of-sight (LOS) between the gun and its target. This is referred to as "indirect fire" where the aiming of the artillery weapon is performed by calculating azimuth and elevation angles in relation to minimum and maximum range of the artillery munitions and target locations. As such, the effectiveness of artillery is dependent upon the position of the gun line where the artillery weapons are positioned (referred to as a firing point (FP), and a "forward observer" (FO)). Because artillery is an indirect fire weapon, the forward observer must take up a position, referred to as an "observation point" (OP), where they can observe the intended target with a clear Line of Sight (LOS). Using various tools such as maps, compass, binoculars, and laser rangefinders/designators, the FO relays target position information to the Fire Direction Center (FDC) to compute the range and direction to the target. The FDC then provides the field artillery unit gunners settings and adjustments to implement prior to firing.

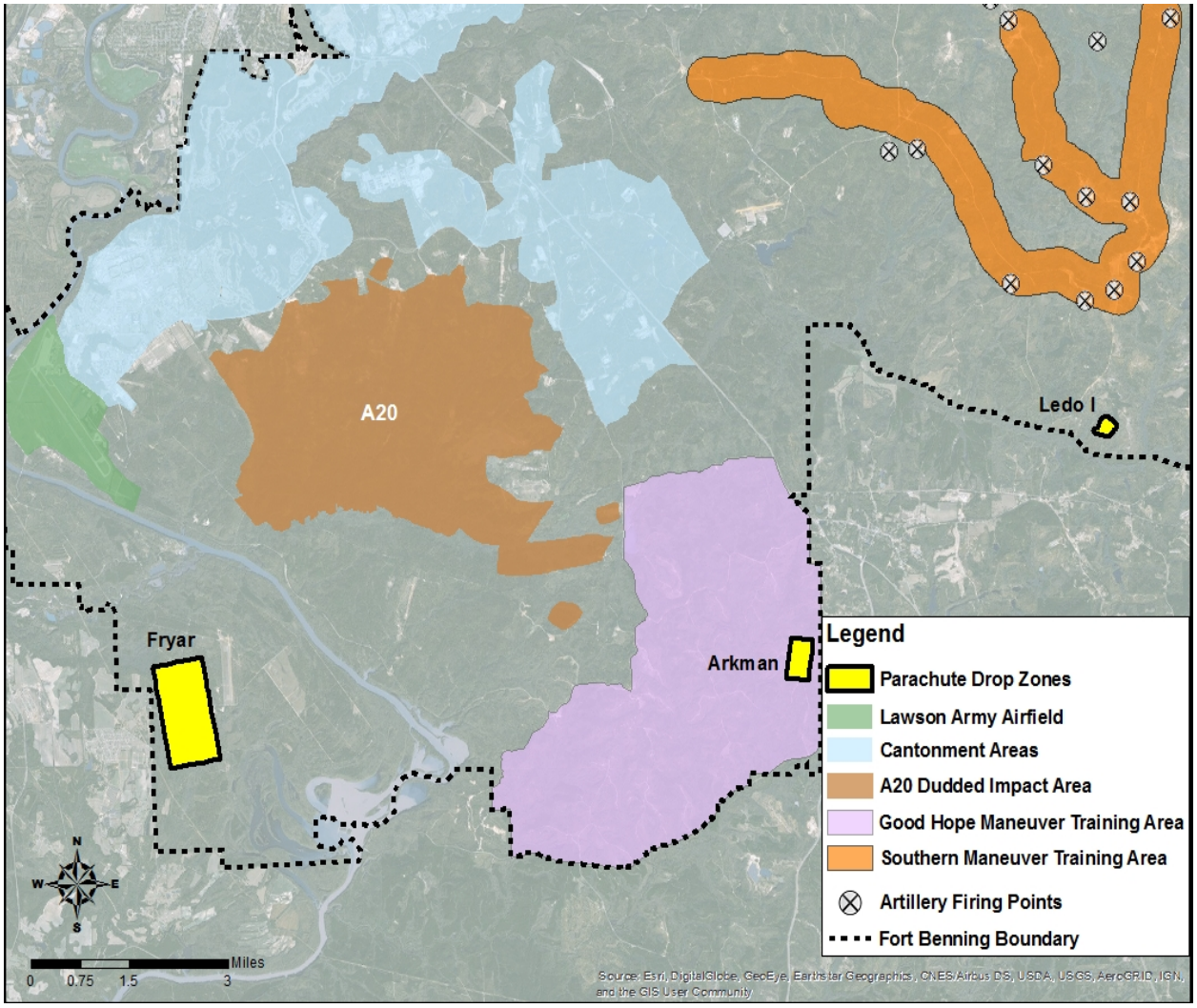
Field artillery units are organized based on the number of guns to be employed in firing operations. The number of guns employed dictates the dimensions of the area required to occupy a FP, as there are dispersal distances between gun positions to ensure safe firing operations, and reduce vulnerability from enemy counterattacks. When an eminent threat to an established FP is identified, the field artillery unit will be ordered to displace to an alternate FP to avoid casualties and damage to equipment. Artillery displaces to provide continuous support, maintain communications, and enhance survivability.

Aerial assets. Lawson Army Airfield (LAAF) is Fort Benning's primary Force Projection Platform and is the hub for all military aircraft operations in and around the Installation. Located in the southwest corner of Fort Benning, LAAF serves as the air terminal for major Forces Command units, the U.S. Army Infantry School, and the aviation units stationed and/or visiting the Installation. Both fixed- and rotary-wing tactical aircraft operate out of LAAF, and fly on established routes within restricted military airspace. Air activities include parachute drops for airborne training, close air support (CAS), and intelligence/surveillance/reconnaissance (ISR) and rescue evacuations for Soldiers injured in the field

during training exercises. Fixed-wing aircraft are primarily used for airborne parachute/jump training and helicopters, (rotary-wing), for troop and cargo lift training.

The US Army Airborne School, widely known as "Jump School", conducts the basic paratrooper (military parachutist) training for the United States armed forces. It is operated by the 1st Battalion (Airborne), 507th Parachute Infantry Regiment. The Airborne School conducts the Basic Airborne Course, which requires open field training areas to support the mission of Airborne training. Fryar DZ, consisting of approximately 1,500 acres, is the primary asset that supports Airborne School training jumps, and is located within the Alabama portion of Fort Benning. A DZ is a large, flat area without structures or trees or other impediments that is used for personnel and equipment to land following a parachute jump from either rotary or fixed-wing aircraft. In addition to Fryar DZ, there are two other smaller open field environments that support Airborne training that include the Arkman DZ which consists of approximately 125 acres within the eastern portion of the Good Hope Maneuver Training Area, and Ledo I (South) that consists of approximately 40 acres and is located within the G01 TA in the southeastern corner of the Installation. The locations of DZs approved for Airborne parachute jumps are illustrated in Figure 1.

Figure 1. Parachute Drop Zone Locations on Fort Benning



The 75th Ranger Regiment and Ranger Training Brigade primarily use rotary winged aircraft for insertion and extraction of personnel and equipment during training exercises. The open field training environments that support tactical training with rotary aircraft are designated as HLZ/PZs. These HLZ/PZs also serve safety purposes in case of an emergency such as transporting injured Soldiers (or other personnel) from the field. There are 23 HLZ/PZ locations within the maneuver training areas across the Installation ranging from just over an acre to 40 acres, that are considered "unimproved" as they are unpaved, and generally consist of open grassy areas. Similar to FP requirements, these open field environments also require flat topography, and to be cleared of obstructions that could create hazards to Soldiers and equipment. Other HLZ/PZ sites exist, but are within established, live-fire ranges that are paved and considered to be improved, which do not require the same type of maintenance activities to sustain their functionality.

Management. Management of the open field training environment would be in accordance with the Army Regulation 350-19, *The Army Sustainable Range Program,* which lays the groundwork and establishes responsibilities and procedures to manage training assets while minimizing impacts to the environment. The Sustainable Range Program (SRP) goal is to maximize the capability, availability, and accessibility of ranges and training lands to support doctrinal training requirements, mobilization, and deployments under normal and surge conditions. These goals are implemented by the Integrated Training Area Management (ITAM) program which advocates proactive conservation and land management practices by aligning Army training land management priorities with the Army training and readiness priorities. ITAM provides the bridge between training requirements and natural resource management activities that promote the conservation and sustainability of Fort Benning's natural resources.

1.3 Purpose and Need

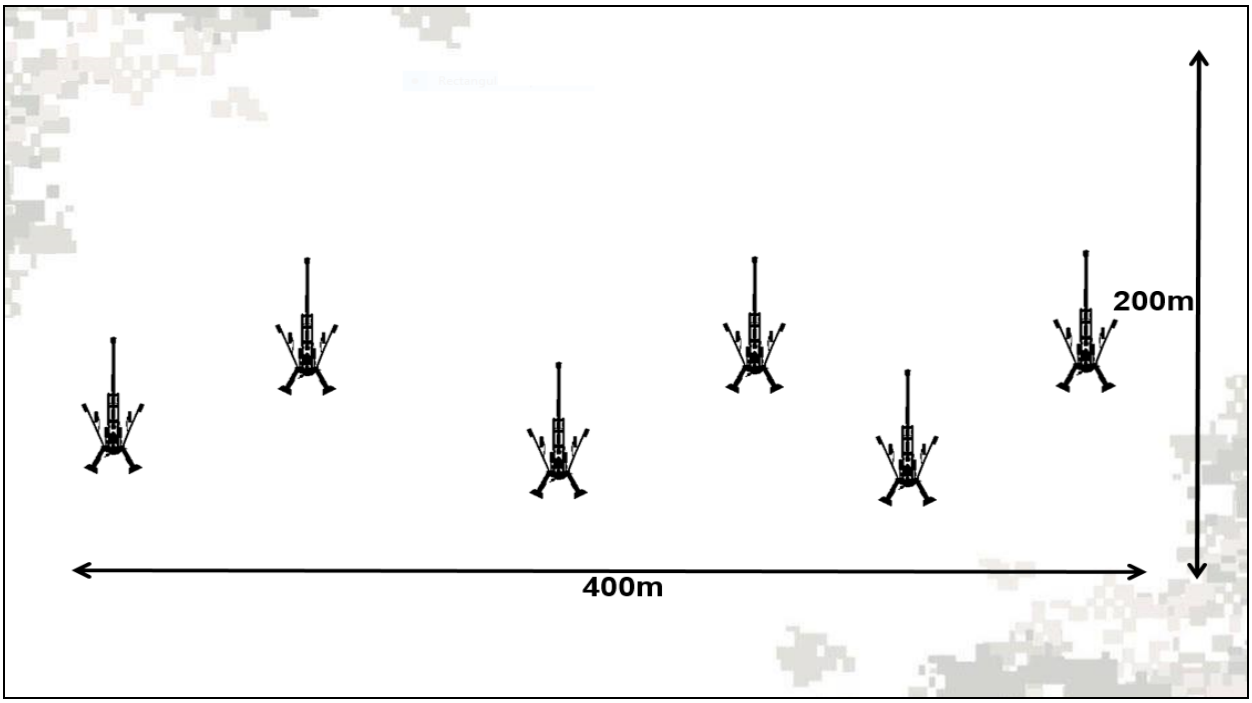
Since the terrorist attacks of September 11, 2001, two of Fort Benning's major tenant units, (the 75th Rangers and the 3rd ID), were in a steady cycle of combat deployments to Iraq and Afghanistan through 2014 when combat operations were officially ended in those countries (DeYoung 2014). As such, many of the existing training assets/areas to support training with artillery and aviation components (primarily rotary-wing aircraft), were not utilized or maintained on a regular basis. Consequently, a majority of the existing FPs and smaller HLZ/PZs throughout the training areas have been encroached with vegetation within and along the perimeters of their footprints, and many have soil erosion issues resulting in irregular, uneven, and rutted surfaces. This combination of encroaching vegetation and soil erosion poses safety issues not only with the utilization of these training areas for staging of equipment and conducting training, but also hinders the ability for Soldiers and equipment to safely access these areas in some instances.

With the recent Army Force Structure decisions to establish the 1-28th IBTF at Fort Benning, the weapons system and training requirements of the artillery support unit have changed. The transition from self-propelled, tracked Paladins and mortar carriers to HMMWV towable artillery and mortar guns will require improvements to the existing FPs that support indirect fires into the K15 dudded impact area. Field artillery units of the 1-28th IBTF are organized based on the number of guns to be employed in firing operations. The number of guns employed dictates the dimensions of the area required to occupy a FP, as there are dispersal distances between gun positions to ensure safe firing operations.

A "battery" based unit consists of six howitzer guns, whereas a "half-battery" is a platoon based unit that consists of three guns. Mortar elements consist of "platoons" and "sections" of four or three guns respectively. The formation (or layout) of the guns at a FP will be dependent upon the training objectives of the mission, displacement operations, and the open field dimensions and accessibility of the FP.

Employments of a howitzer battery requires an open field environment of 400 meters long by 200 meters wide (19.77 acres), whereas a half-battery requires an area 200 meters by 200 meters (9.88 acres) as illustrated in Figures 2 and 3 respectively. Mortars dispersal spacing require an open field environment of 300 meters by 150 meters. All of the FPs that support artillery and mortar fires into the K15 dudded impact area require expansion to accommodate the required dispersal spacing between guns in a formation.

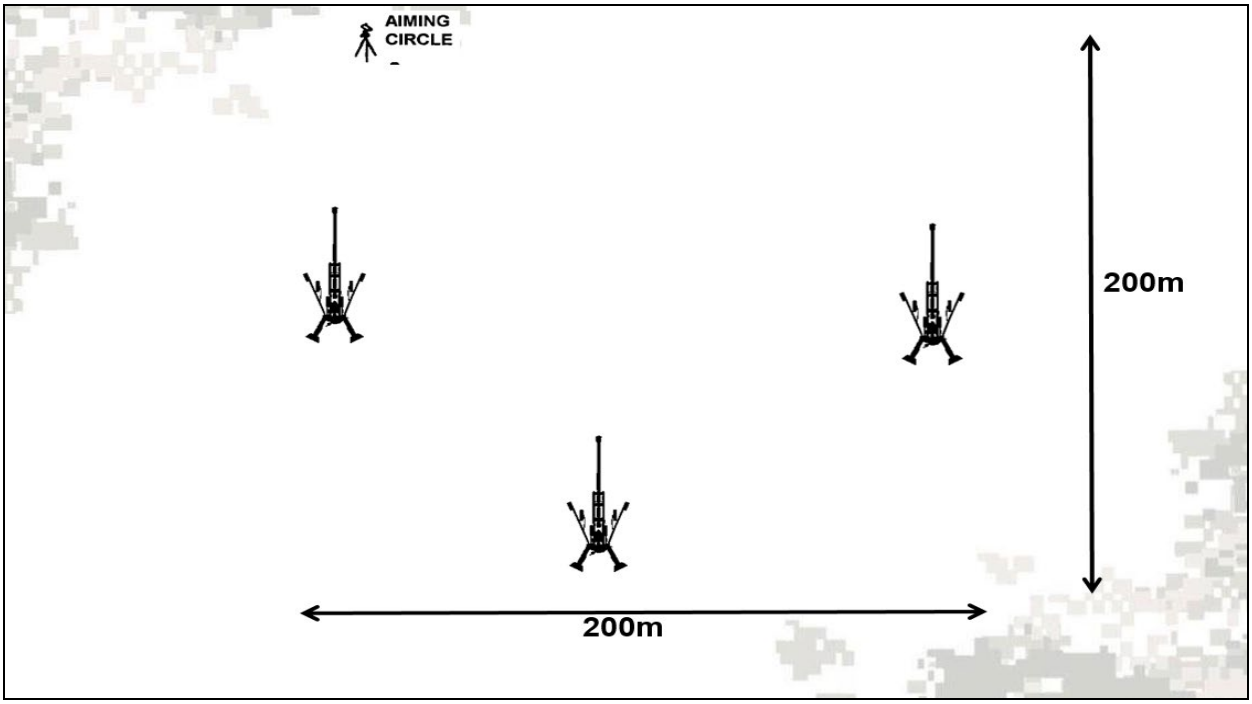
Figure 2. Howitzer Battery Occupation of a Firing Point



For artillery operations to function safely at full capabilities, FPs must consist of large areas with flat topography and be clear of obstructions that could create hazards to Soldiers and equipment. Access roads to FPs must also be flat and free of obstructions as artillery and mortar elements will be towed with HMMWVs. To ensure the functionality and sustainability of these FPs and access roads, long-term maintenance activities must be implemented to provide operational training of the open field training environment. Additionally, the targets must be visible to the FO to relay the target position information to the FDC to determine the settings and adjustments the field artillery gunners must make to hit the intended target. This requires a clear LOS from an OP to a target. However, vegetation within the K15 dudded impact area currently impairs the visibility of the intended targets and reduces training capabilities. Vegetation removals will be required to support the mission of the artillery units at Fort Benning.

It is imperative for Fort Benning to provide and maintain operational and environmentally sustainable open field training environments that support the elements of artillery training, Airborne and Ranger tactical training, and implement long-term maintenance activities to support current and future military missions. The open field training environment that encompasses FPs, DZs, and HLZ/PZs are essential components of the Soldier readiness, and require long-term maintenance activities to support the operational tempo.

Figure 3. Howitzer Platoon Occupation of a Firing Point (half-battery)



1.4 Decision to be Made

The Army decision to be made is whether the Proposed Action would result in a Finding of No Significant Impact (FNSI) and which action alternative and mitigation to implement, if any. There are two Action Alternatives proposed to improve Field Artillery training assets and to support Airborne and Ranger aerial training. Both Alternatives also include maintenance activities in the short- and long-term to sustain the operational open field environment. One Alternative also includes the restoration of an inactive training site to support artillery training. Chapter 2 discusses the Action Alternatives in detail, as well as the No Action Alternative. The final decision of which alternatives to implement will be documented in either a FNSI if no significant environmental impacts are expected, or a Notice of Intent (NOI) to prepare an EIS if significant impacts are expected to occur as a result of the alternatives. A FNSI will identify the Army's selected alternative and identify mitigation measures that are essential to the reduction of identified impacts. In making the decision, the Army will select among the three alternatives described in Chapter 2.

1.5 Scope of Environmental Analysis

This EA identifies, documents, and evaluates the potential environmental effects of Proposed Action at Fort Benning in accordance with NEPA implementing regulations issued by the CEQ (40 CFR Parts 1500–1508) and the Army's NEPA Regulation (32 CFR Part 651). The purpose of this EA is to inform decision-makers and the public of the potential environmental consequences of the Proposed Action along with associated mitigation. The EA qualitatively and quantitatively evaluates the environmental and socioeconomic impacts of the Proposed Action and the Alternatives considered. Under NEPA, the analysis of environmental and socioeconomic conditions only addresses those areas, or region of influence (ROI), and environmental resources with the potential to be affected by the Proposed Action. Locations and resources with no potential to be affected are not analyzed. The ROI, which includes all

areas that might be affected, may vary by resource.

The Army's NEPA regulation calls for the environmental analysis to be proportionate to the nature and scope of the action; the complexity and level of anticipated effects on important resources; and the capacity of Army decisions to influence those effects in a productive, meaningful way from the standpoint of environmental quality. Project footprints, construction activities and time frames, and training descriptions for each of the proposed alternatives have been identified to the fullest extent possible at this time. In the absence of specific information, the analysis conservatively estimated the environmental impacts of the Proposed Action and addresses potential broad-level environmental impacts.

1.6 Public Involvement

Fort Benning invites public participation in their Federal decision-making through the NEPA process as required by CEQ and Army NEPA Regulations. All agencies, organizations, and members of the public with a potential interest in the Proposed Action are urged to participate in the decision-making process. The EA and Draft FNSI were distributed to individuals and organizations on the distribution list in Chapter 8.0 for a 30-day review and comment period. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making in consideration of public concerns. Based on the results of the EA analyses, and with consideration given to public and agency comments, the Army will make a determination as to whether implementation of the Proposed Action would have significant effects on the environment. If it is determined that the Proposed Action would have significant, adverse effects, the Army will issue an NOI to prepare an EIS. If it is determined that the Proposed Action would not have significant adverse effects, the Army will select the Proposed Action for implementation.

A Notice of Availability (NOA) was distributed to individuals and organizations on the distribution list and posted in the Columbus Ledger-Enquirer, The Journal, and Benning News (online) by 28 March 2019. Copies of the EA and Draft FNSI were made available for public review at four libraries in the region: Columbus Public Library, Cusseta-Chattahoochee Public Library, Sayers Memorial Library, and the Phenix City-Russell County Public Library.

Electronic versions of the EA and Draft FNSI were also posted on the Fort Benning website: http://www.benning.army.mil/garrison/DPW/EMD/legal.htm.

The public comment period for the EA and Draft FNSI will last 30 days, ending on 27 April 2019. Written and electronic comments must be received by 30 April 2019 to ensure consideration prior to reaching any decisions. Written comments should be forwarded to:

Fort Benning Environmental Management Division
IMBE-PWE-P
C/O NEPA Program Manager
6650 Meloy Drive
Building 6, Room 309
Fort Benning, GA 31905-5122

Electronic comments should be submitted to the NEPA Program Manager: Mr. John Brown at: john.e.brown12.civ@mail.mil.

The EA and Draft FNSI were distributed to individuals and organizations on the distribution list in Chapter 8.0 for a 30-day review and comment period. Based on the results of the EA analyses, and with consideration given to public and agency comments, the Army will make a determination as to whether implementation of the Proposed Action would have significant effects on the environment. If it is determined that the Proposed Action would have significant, adverse effects, the Army will issue an NOI to prepare an EIS. If it is determined that the Proposed Action would not have significant adverse effects, the Army will select the Proposed Action for implementation.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Introduction

Fort Benning needs to improve the functionality and sustainability of its open field training environment that supports the missions and POIs of the Airborne and Ranger Training Brigade, 75th Rangers, and the Field Artillery units of the Infantry School and the 1-28th IBTF, as well as other tenant and/or visiting units' training requirements. Sound, proactive land management is essential for ensuring training can be accomplished on existing and potential future training land assets on Fort Benning to support current and future Army missions.

2.2 Proposed Action

There are two Action Alternatives proposed that involve a number of common elements: 1) Expand and improve existing FPs on Fort Benning to support the requirements of field artillery training firing into the K15 dudded impact area, which will also include improvements to access roads and implementation of erosion control measures; 2) Support field artillery training by restoring the LOS between OPs and targetry in the K15 dudded impact area; 3) Support the Airborne and Ranger mission through long-term maintenance activities that sustain functionality of the open field training environment while minimizing safety hazards to Soldiers and equipment for all DZ/HLZ/PZs. Each component of the Proposed Action is discussed in more detail in the following sections.

One of the Action Alternatives includes the restoration of an inactive OP known as the Hartell Bunker. The activities required to restore the functionality of this historical OP are discussed further in Section 2.2.2 (Restoration of Line of Sight to Support Artillery Training). The implementation of this Alternative (if so chosen) would provide an additional, functional OP to the K15 targetry to support field artillery training.

Also as part of the Proposed Action, Fort Benning will comply with all applicable Federal and State Laws and Army Regulations as well as Installation Management Plans. These laws and regulations include, but are not limited to: Clean Air Act; Clean Water Act (to include Section 404 compliance for wetlands and Nation Pollution Discharge Elimination System permitting for land disturbing activities); Resource Conservation and Recovery Act (for hazardous waste management); and the Endangered Species Act. Fort Benning Management Plans include, but are not limited to: Spill Prevention, Control and Countermeasures; Hazardous Waste Management Plan; Integrated Pest Management Plan; and the Integrated Natural Resource Management Plan. In addition, all proposed activities to implement the Proposed Action will be analyzed through Fort Benning's NEPA review process. A Request for Environmental Analysis through the submittal of an FB-144R form detailing the scope of the action or activity will be reviewed prior to implementation to ensure that the potential impacts fall within the analysis presented in this EA.

2.2.1 Field Artillery Training and Assets

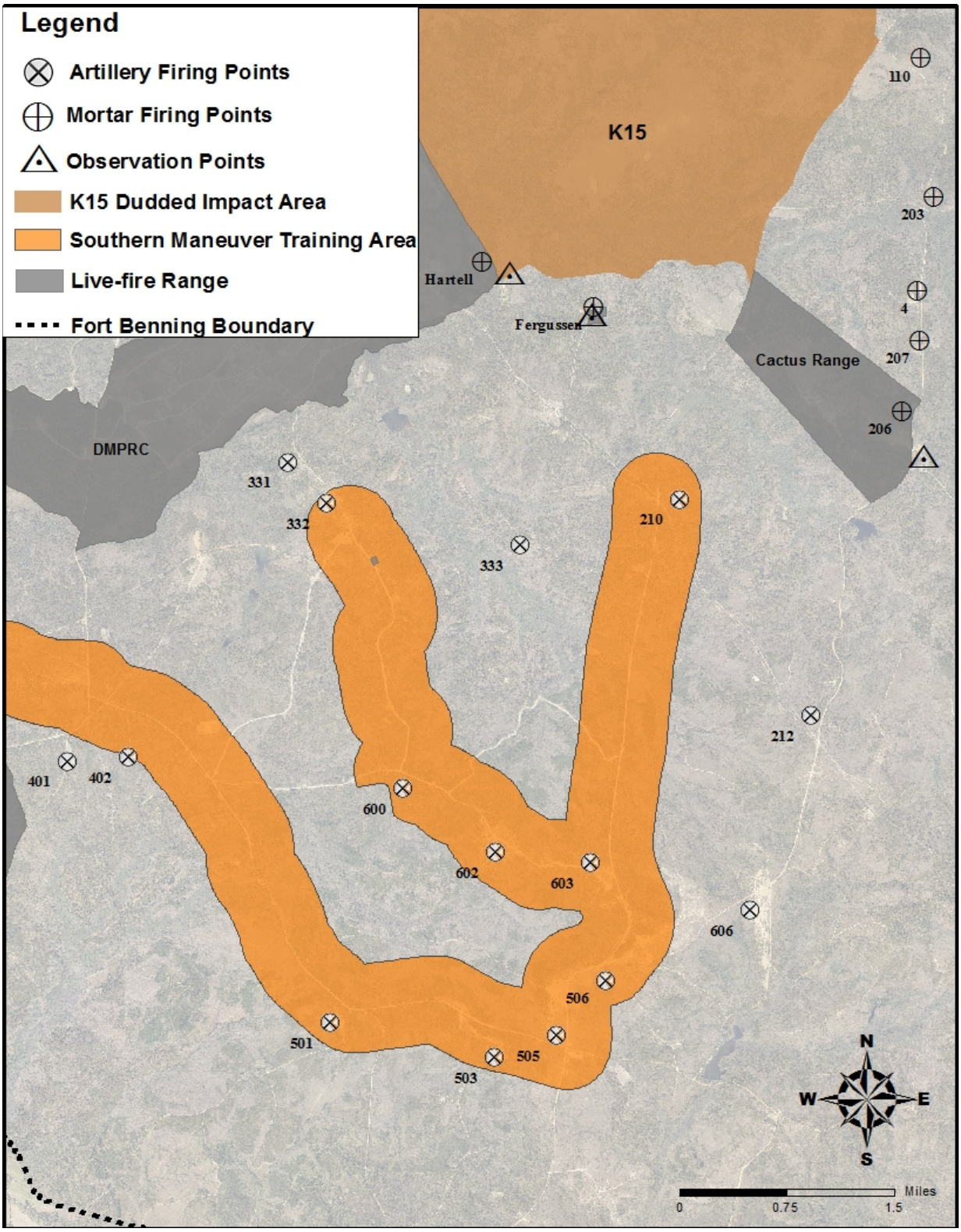
There are 22 existing FPs, (15 artillery and 7 mortar) located in the maneuver training areas within the eastern and southeastern portion of Fort Benning that fire into the K15 dudded impact area. Two of these firing points are within the footprints of the Digital Multi-Purpose Range Complex (DMPRC) and Cactus Range as illustrated in Figure 4. There are also other mortar FPs on Fort Benning located at live fire ranges that either support mortar fires exclusively (e.g. Malone 24 and 25), that fire into the Malone Complex dudded impact area; or as part of other multi-purpose ranges that support combined arms live fire exercises (e.g. Red Cloud and Coolidge Left) that involve a variety of weapons systems that fire into

Alpha 20 (A20) dudded impact area. Mortar FPs at these ranges can support the dispersal distances required between guns to meet the training requirements, and do not need to be expanded and/or improved. Therefore, for the Proposed Action, expansions to artillery and mortar FPs will be solely focused on those 22 sites located within the maneuver training areas and ranges that fire into the K15 dudded impact area, as they are currently undersized to accommodate the required gun dispersal distances and formations for indirect fires training. A list of artillery and mortar FPs, proposed footprint dimensions, and acreages are presented in Table 1.

For Soldier and equipment safety considerations, FP areas would need to be maneuverable for HMMWVs and all towable artillery weapons. Activities at these locations would include timber and vegetation removals by mechanical methods (e.g. chainsaws, bush hogs, etc.). Tree stump removals and/or grinding may be needed dependent upon topography and safety concerns, and grading of the FP "boxes" would occur where needed to ensure there were no major dips or pot holes across the terrain. As access to most of the FP locations are via unimproved roads and/or dirt trails, improvements such as grading and placement of gravel may be needed stabilize soils to improve access for vehicles and equipment. All FPs and access roads will include the erosion control features as needed to ensure sustainability of the training sites.

Long-term maintenance activities to sustain the functionality for FPs and access trails would potentially include grading/leveling ruts, rills, and uneven terrain. In instances of severe erosion (natural or from training events), some areas may need to be filled and/or stabilized with aggregate stone to maintain a stable, flat terrain. Approved grass seed would be applied for soil stabilization and reduction of erosion after grading activities. There may also be a need to remove encroaching vegetation within the FP footprint. Encroaching vegetation would be regularly maintained or removed through mowing and bush-hogging, or by hand methods for smaller, localized areas. If there is an identified need for the applications of an herbicide, it will be done in accordance with the manufacturer's label, Environmental Protection Agency (EPA) guidance, and Fort Benning's IPMP. The recurrence of such activities will be dependent upon the operational tempo of training, the amount of damage incurred from training events, as well as rain events and natural erosion process, and vegetation growth rates.

Figure 4. Location of Field Artillery Training Assets*



**Does not include other artillery and/or mortar firing points that fire in the Malone Complex or A20 dudded impact areas.*

Table 1. Proposed Action Firing Point Expansions

Firing Points*	Firing Point Dimensions (meters)	Acres	Proposed Action Activities
Artillery FP 210	200 x 200	9.88	*Expansion/Construction* Timber and vegetation removals by mechanical methods. Tree stump removals and/or grinding as needed. Grading and levelling uneven terrain, and filling ruts/rills with stone and/or dirt as needed for stabilization. Grading and stabilization of access roads. Install erosion control features as needed.
Artillery FP 212	200 x 200	9.88	
Artillery FP 331	400 x 200	19.77	
Artillery FP 332	400 x 200	19.77	
Artillery FP 333	200 x 200	9.88	
Artillery FP 401	200 x 200	9.88	
Artillery FP 402	200 x 200	9.88	
Artillery FP 501	400 x 200	19.77	
Artillery FP 503	400 x 200	19.77	
Artillery FP 505	400 x 200	19.77	
Artillery FP 506	400 x 200	19.77	
Artillery FP 600	200 x 200	9.88	*Future Maintenance* Removals of encroaching vegetation by hand clearing, bush-hogging, or rotary mulching. Herbicide application as needed. Grading and levelling uneven terrain, and filling ruts/rills with stone and/or dirt as needed for stabilization for FPs and access roads. Repair existing or install erosion control features as needed.
Artillery FP 602	400 x 200	19.77	
Artillery FP 603	400 x 200	19.77	
Artillery FP 606	400 x 200	19.77	
Mortar FP 110	300 x 150	11.12	
Mortar FP 203	300 x 150	11.12	
Mortar FP 206	300 x 150	11.12	
Mortar FP 207	300 x 150	11.12	
Mortar FP 4	300 x 150	11.12	
Mortar FP Concord/Fergusson	300 x 150	11.12	
Mortar FP Hartell	300 x 150	11.12	
	Total	315.05	

** All FPs to be expanded are consistent between Alternative 1 and Alternative 2 as illustrated in Figure 4.*

2.2.2 Restoration of Line of Sight to Support Artillery Training

As briefly discussed in Section 1.2, artillery and mortar are considered to be "indirect fire" as the gunners are unable to view the targets at which they are engaging. Other support elements such as the FO and FDC are required to assist the gunners in accomplishing their mission. The FO must take up an OP where they can observe the target to be fired upon, and relay this information to the FDC to instruct the gunners to adjust their fire as needed.

The artillery FPs listed in Table 1 fire at targetry located within the K15 dudded impact area located in the northeastern portion of Fort Benning. There are two OPs that have been used to support artillery training for these FPs– Concord/Fergusson (located directly south of K15), and the K36 Ranger Objective (located to the southeast of K15 near Cactus Range), as illustrated if Figure 4. However, there is limited visibility from these OPs to target locations within the K15 impact area which hinders the FO's ability to determine

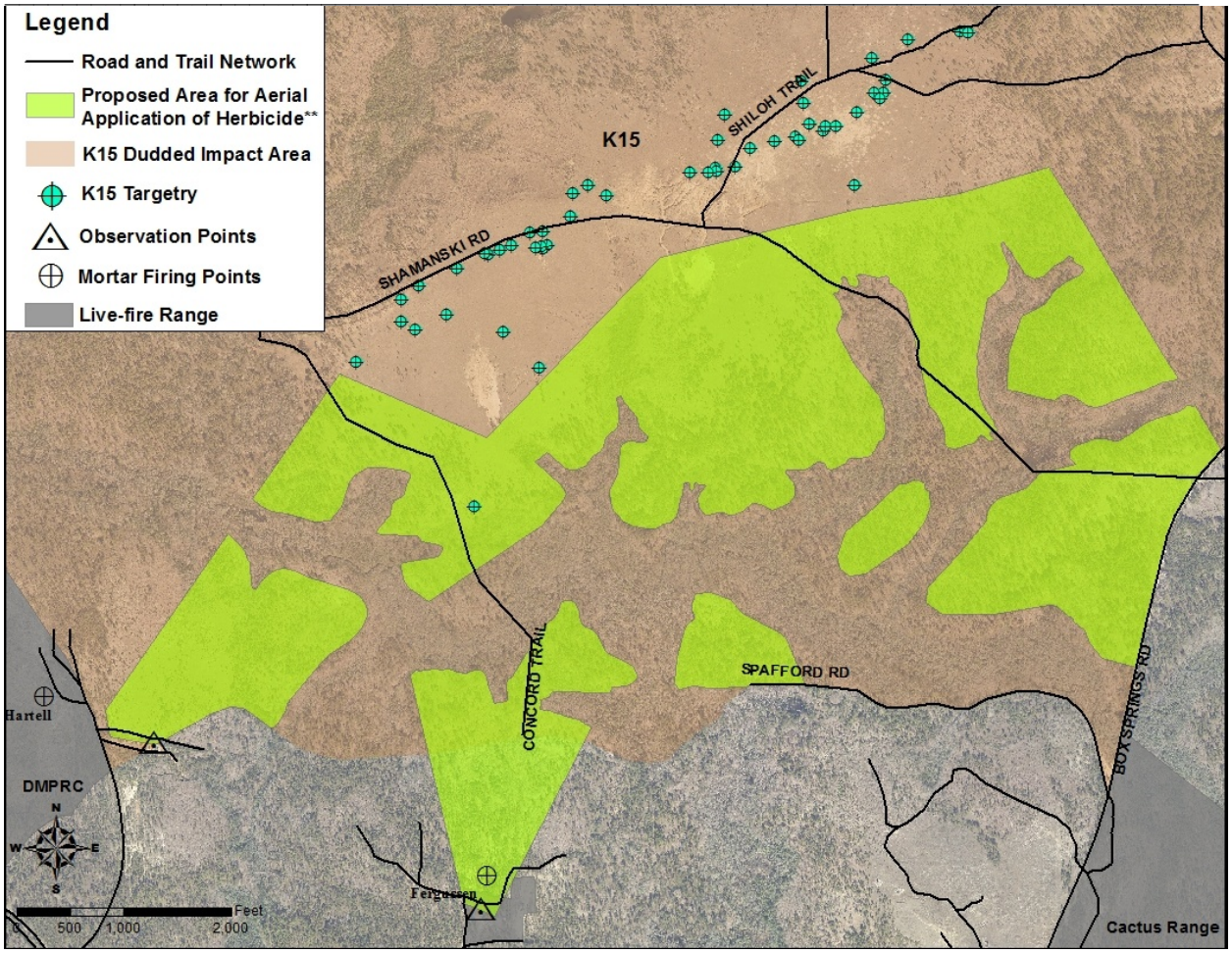
adjustments to the artillery and mortar guns to hit their mark. Vegetation has encroached into the LOS from these OPs, and timber removals are needed to restore the LOS capabilities from these locations. The area identified is within the K15 impacts area and will require the aerial application of herbicides due to safety concerns from Unexploded Ordnance (UXO).

Aerial application of herbicide is the preferred method to eliminate encroaching vegetation in impact areas, training areas, and range footprints where UXO precludes safe access to the areas to use other forms of removal or control of vegetation (e.g. bush-hogging, drum chopping, etc.). Dependent upon the Alternative chosen to implement the Proposed Action, there is the potential to aerially apply herbicide over an approximately 530 acre area to restore LOS to the K15 targetry. Typically aerial herbicide applications on Fort Benning have focused on hardwood overstory removals in order to promote longleaf pine restoration (and subsequently enhance RCW habitat), and to control invasive species. However, the herbicide application within the K15 impact area is intended to remove both the hardwood and pine (evergreen) overstory trees to restore LOS. Aerial application of herbicide is proposed for an area south of Shamanksi Road and Shiloh Trail, and bounded by the Digital Multi-Purpose Range Complex and Box Springs Road to the west and east respectively as illustrated in Figure 5. This area was determined based on ground elevations and tree heights between the OPs and the targetry.

Per Department of Defense (DoD) policy, aerial application of herbicides must be approved by the Pest Management Coordinator of Army Environmental Command (AEC). This is done through the preparation and submittal of an "Aerial Spray Statement of Need" (ASSON). In accordance with Army Regulation (AR) 200-1, (*Environmental Protection and Enhancement*), an ASSON is required to include: rationale; description of the target area; pesticide information; application information; alternative methods; sensitive areas; Federal, State, and County coordination; and environmental documentation. At this time, as it is unknown which Alternative will be implemented, and what herbicide(s) and application rates will be required to achieve the desired effects, Fort Benning does not have an approved ASSON to support this component of the Proposed Action. However, at the time when these variable have been resolved, Fort Benning will prepare an ASSON for AEC review and approval, and all activities associated with the aerial application of herbicide will be conducted in accordance with the manufacturer's label, Environmental Protection Agency (EPA) guidance, Fort Benning's IPMP, and all applicable Federal, States, and local laws and permitting.

Ground application of herbicides or timber removal operations to restore LOS to the K15 targetry is impractical as the 530 acre area would have to be surveyed for UXOs, and subsequently be removed for the safety of personnel and equipment access. Additionally, the aerial application of herbicide is more time efficient and fiscally sensible. Although cost per acre of UXO surveys and removals can vary considerably dependent upon the types and quantity, it far surpasses the cost of aerial herbicide applications costs, which can be as low as $100 per acre (dependent upon acreage to be sprayed and rate of herbicide application), vice $15,000 (or considerably more) per acre for UXOs removal even before accruing the cost of manpower for ground application of herbicides and/or timber removal operations (pers. com. Waldrep and Van Allen 2017).

Figure 5. Proposed Area for Aerial Application of Herbicide to Restore LOS to K15 Targetry



***Area represents the maximum acreage for herbicide application (approximately 530 acres). Actual acreage will be dependent upon the Alternative selected for implementation.*

In addition, ground access to the areas proposed for aerial herbicide application is limited due to the lack of a trail network, as well as the density of the vegetative overgrowth which can hinder visibility and complicate UXO survey efforts. In contrast, the access trails within the K15 dudded impact area that lead to the target areas are largely void of vegetation due to the constant impact of munitions, and as such have not required a large scale application of herbicide to improve accessibility. The maintenance cycle for the K15 targetry is approximately every five to ten years dependent upon the operational training tempo (pers. com., Van Allen 2017). Maintenance activities for K15 targetry consist of UXO surveys and removals are localized to the access trails and the impact area target sites, which consist of hard targets (e.g. tank hulls and other military vehicles), that are transported with Heavy Equipment Transporters (HETs). These activities are not a component of the Proposed Action, as this is a semi-regular occurrence and would be considered as part of the baseline for normal ITAM operations on an as needed basis.

In the short-term, restoration of the LOS to the K15 targetry may require more than one aerial application of herbicide. This will be dependent upon the effectiveness of the herbicide used as the target species are diverse, (e.g. pine vs. hardwoods), and the area identified is heavily vegetated. Initial herbicide applications may not reach some of the understory due to overgrowth of foliage of taller vegetation, and therefore require additional applications to achieve the desired results. Long-term activities to maintain

the LOS to the K15 targets will consist of additional aerial herbicide applications, but the frequency will be dictated by rates of vegetative growth, and is approximated to occur every 15 – 20 years (pers. com. Thornton 2017).

One of the Action Alternatives also includes an additional consideration to improve the training assets and capabilities of artillery training. As the Concord/Fergusson and K36 Ranger Objective (Cactus Range) OPs are located to the south and southeast (respectively) of the K15 impact area, the restoration of an unutilized training site known as the Hartell Bunker would provide an additional, operational OP to the southwest, providing an additional site for the FO to direct artillery firing into the K15 dudded impact area (see Figure 4). The Hartell Bunker was constructed in 1976 and is located within the restricted access area at the very southwest edge of the K15 impact area. This restricted access area represented a "buffer zone" that provides an outside border to the dudded impact area, and requires approval from Range Operations prior to entry. Although there is no targetry located within the restricted access area, there is a possibility that this buffer zone could contain fragments, debris, and/or components from exploding munitions fired from nearby ranges based on probable errors (PE) dependent upon the direction of fire and position of targetry (DA 2014).

Preliminary assessment of the Hartell Bunker area indicate that there is a high potential for the presence of UXOs that prevent it from being safely utilized as an OP. As such, the Hartell Bunker area will require extensive surface and subsurface UXO surveys and removals to restore the area to a fully operational training site to ensure Soldier and other personnel safety. These surveys will be conducted by the 789th Explosive Ordnance Detachment (EOD), or by qualified contractors if EOD personnel are unavailable (e.g. deployment, training cycles, etc.). The safest methodology for UXO management is to be detonated and destroyed at the location at which it is discovered, ("blow-in-place"), as part of training exercises for range clearance procedures in accordance with the Military Munitions Rule (MMR) under the Resource Conservation and Recovery Act (RCRA). If an emergency situation arises during a UXO survey, EOD and the Fort Benning Environmental Management Division (EMD) will coordinate with the Georgia Environmental Protection Division (GAEPD) to obtain any emergency permits required to recover, destroy, or otherwise manage UXOs as necessary to protect human health, safety, and the environment.

After UXO removals are completed the Hartell Bunker OP area will continue to be a restricted access area based on its adjacency to the K15 dudded impact area. However, upon completion of live-fire events any dud munitions noted will be reported to EOD and Range Division to be marked and destroyed as a component of training and standard operating procedures for range clearance. In addition, per MCoE 350-19 Regulations, prior to entering any training area, all personnel (Military or Civilian) will obtain clearance from Range Operations who will arrange a surface survey of the area to render harmless any objects found. Fort Benning military, civilian personnel, and the community are routinely advised and reminded not to handle any suspected unexploded ordnance (UXO), and to report suspicious ordnance to the Explosive Ordnance Detachment (EOD) and to the Director of Public Safety via 911 call. UXO warning articles are periodically published in the Fort Benning Bulletin.

2.2.3 Support the Airborne and Ranger Training Mission

There are three approved DZs (as illustrated in Figure 1), ranging from 40 acres to 1,500 acres to support Airborne parachute jump training, and 23 designated HLZ/PZ locations within the maneuver training areas across the Installation ranging from just over an acre to 40 acres. Similar to FP requirements, these open field environments also require flat topography, and to be cleared of obstructions within the footprints, as well as obstacles (such as trees, power lines, etc.), within the approach and departure flight paths that could create hazards to Soldiers and equipment. Other HLZ/PZ sites exist, but are within established, live-fire range footprints that are considered to be improved (e.g. concrete pads, paved, etc.),

which do not require the same type of maintenance activities to sustain their functionality, and are not a part of this assessment.

Long-term, maintenance activities would be required to sustain the functionality for DZ/HLZ/PZ open field environments and would potentially include the grading/leveling of ruts, rills, and uneven terrain. In instances of severe erosion (from training events or naturally from rain events), some areas may need to be filled and/or stabilized with aggregate stone to maintain a stable, flat terrain. Approved grass seed would be applied for soil stabilization and reduction of erosion after grading activities. Encroaching vegetation will be regularly maintained/removed through mowing and bush-hogging, or by hand methods for smaller, localized areas. The recurrence of such activities will be dependent upon the operational tempo of training, the amount of damage incurred from training events, as well as rain events and natural erosion process, and vegetation growth rates.

Some areas may require "spot" application of herbicides by hand, where much larger areas may require aerial application of herbicide. Specifically, the primary DZ for Airborne parachute jump training (Fryar DZ), has been considered for recurring aerial application of herbicide to slow down (or "retard"), growth rates of Bahia grass. Bahia grass is a preferred species for the open field training environment because it is hardy, stabilizes the soil well, and requires little care other than mowing. However, the height of the grass must be controlled in order to maintain visibility of the ground for incoming aircraft and paratroopers. Accordingly, the desired height of Bahia grass in the Fryar DZ is preferred to be no more than twelve inches. During the peak growing season, Bahia grass produces rapidly-growing seed stalks that can easily exceed eighteen inches in height.

Currently, Bahia grass height is maintained by mowing, bush-hogging, and/or disking/rotary mulching. However, during the peak of the growing season, these mechanical maintenance intervals are often insufficient to keep grass height below a level where safety concerns begin to develop. Presently, Fryar DZ is scheduled for mowed three times during the growing season, but should be maintained more frequently, preferably every three weeks, in order to avoid concerns over visibility and safety. Aerial application of herbicide is preferred over ground application due to the time required to control grass height of the area involved (approximately 1,500 acres); this time is rendered unavailable for scheduling of training and has a negative impact on mission accomplishment.

The recurrence of aerial application of growth retardant herbicide will be dependent upon Bahia grass growth rates, and maintenance schedules of contracted for mowing activities that may be committed to other areas of the Installation, (e.g. Cantonment areas, LAAF, etc.) Application of growth retardant herbicide also requires preparation of an ASSON for AEC review and approval as discussed in Section 2.2.2, as the intent for this maintenance activity is not to remove vegetation, but rather disrupt growth rates. All activities associated with the aerial application of herbicide will be conducted in accordance with the manufacturer's label, EPA guidance, Fort Benning's IPMP, and all applicable Federal, States, and local laws and permitting. Other DZ/HLZ/PZs locations apart from Fryar DZ are not currently being considered for aerial application of an herbicidal growth retardant at this time primarily as their smaller acreages are more manageable through mechanical means and maintenance schedules.

Current DZ/HLZ/PZ sites are functional for approach and departure safety requirements and do not require the removal of timber stands within the approach/departure clear zones or glide paths. Therefore, assessment of vegetation removal will be solely within existing footprints for encroachment and safety issues. If in the future bordering timber stands, or other vegetation, need to be removed due to height restrictions for safety within the glide paths for approaches and departures, or a change in mission requirements, these activities would be reviewed through the Fort Benning NEPA review process to assess potential environmental impacts in accordance with the Army NEPA regulation.

Over time DZs can build up what is referred to as a "hard pan" where a hardened impervious layer of soil can form under the uppermost topsoil layer. The presence of a hard-pan increase the shock of impact during Soldiers' parachute jump landings, and can cause injuries to their feet, ankles, legs, hips, or upper body. To minimize these potential injuries, additional maintenance activities for DZs include disking and/or rotary mulching with a large tractor to soften the ground surface and aerate the soil, which also helps to improve plant growth. The areas will be reseeded to minimize soils losses and the potential for sediment runoff during rain events. This type of additional maintenance may also be required on HLZ/PZs as identified by Soldiers or ITAM personnel during training events, or general maintenance checks throughout the Installation. The recurrence of such activities will be dependent upon the operational tempo of training, and amount of damage incurred from training events as well as rain events and natural erosion processes.

2.3 Alternatives Screening Criteria

The Army used screening criteria to determine which Alternatives are reasonable. Satisfaction of these screening criteria would provide an Alternative suited to meet the purpose of and need for the Proposed Action, while potentially minimizing adverse environmental impacts, and support the mission needs for Field Artillery, Airborne, and Ranger units, as well as other tenant and/or visiting units' training requirements. The following criteria (in no particular order of importance) have been used to determine whether or not an alternative would be considered reasonable and carried forth for further consideration within this EA:

- The Proposed Action should enhance and support the ability of Fort Benning to conduct its training missions and allow for flexibility in planning for future training requirements
- The Proposed Action should improve and maintain existing training assets to ensure safety and accessibility for Soldiers, vehicles, aircraft and weapon systems, and promote the sustainability of training lands
- Implementation the components of the Proposed Action should minimize environmental impacts to the extent feasible

2.4 Alternatives Considered

2.4.1 Alternative 1

Under Alternative 1, existing FPs would be expanded to support current artillery and mortar weapons dispersal distances between gun positions to ensure safe firing operations, and connector trails to the FPs would be improved to support the vehicle transport of artillery and mortar pieces to those sites. For Soldier and equipment safety considerations, FP areas would need to be maneuverable for HMMWVs and all towable artillery weapons. Activities to expand artillery and mortar FPs would include timber and vegetation removals, grading to maintain and/or regrade slope characteristics, and implementation of erosion control features at the FPs and access trails. Total land disturbances for all proposed FP footprints would be approximately 315 acres based on the safety requirements for gun formations and terrain slope requirements. Improvements to access roads and the implementation of erosion control features that may require additional land disturbances will be determined on a case-by-case basis based on proximity and viability of existing access trails, topographic slopes, and avoidance of impacts to environmental resources within the area. The proposed footprint expansion dimensions for artillery and mortar FPs as listed in Table 1, are illustrated in Figure 6.

The LOS between the Concord/Fergusson and K36 Ranger Objective OPs would be restored through the removal of approximately 455 acres of encroaching pine and hardwood vegetation. Restoration of LOS would require aerial application of herbicide due to safety concerns as the area identified is within the K15 dudded impact area, and mechanical means of vegetation removal are not feasible. The herbicide application area required to restore LOS from the Concord/Fergusson and K36 Ranger Objective OPs is illustrated in Figure 7.

Figure 6. Proposed Footprint Expansions for Artillery and Mortar Firing Points

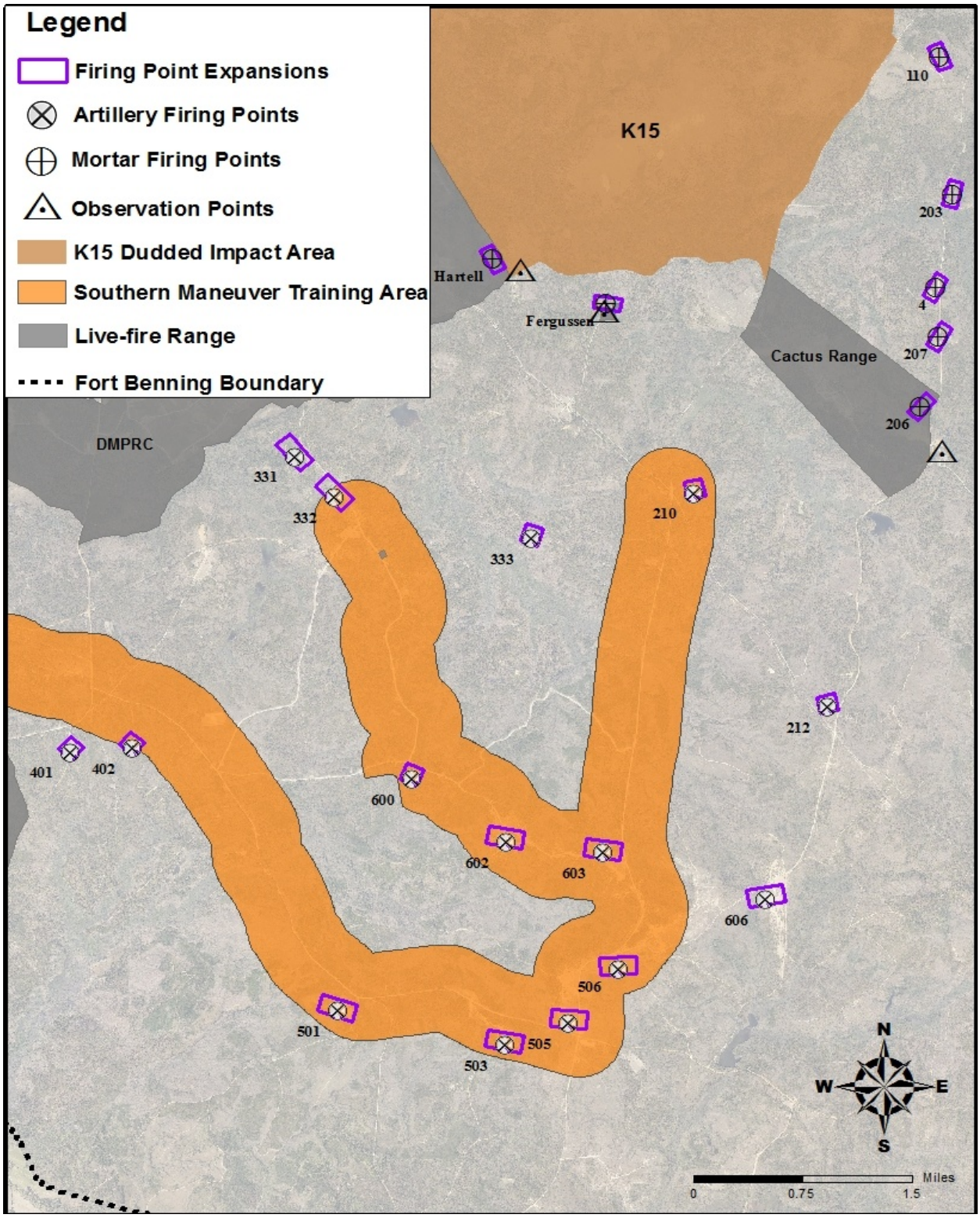
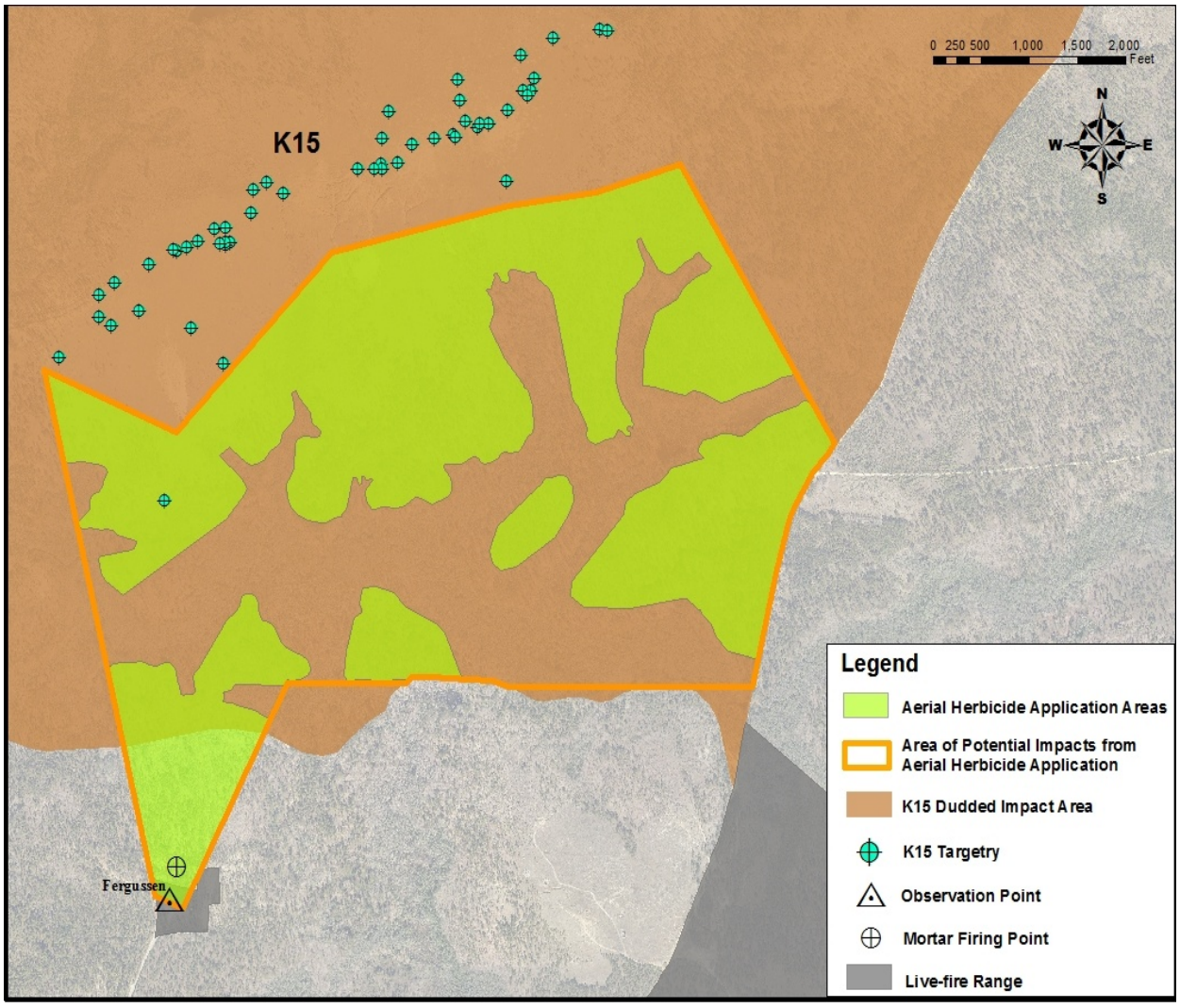


Figure 7. Alternative 1 - Proposed Area for Aerial Herbicide Application Area for LOS Restoration



Long-term maintenance activities would be required to sustain the open field training environment and access trails for Soldier and equipment safety. Activities would include removal of encroaching vegetation by bush-hogging, hand clearing, and herbicide applications (as needed) to maintain the expanded footprints of artillery and mortar FPs, and the unimproved HLZ/PZs footprints. Parachute jump DZs will also require vegetation maintenance by these same methods, but in addition will need disking and/or rotary mulching to loosen and aerate soils that have become compacted to minimize potential injuries to Soldiers upon landing. This type of additional maintenance for DZs may also be required on HLZ/PZs as identified by Soldiers or ITAM personnel during training events, or general maintenance checks throughout the Installation. All open field training environments will require grading and levelling of uneven terrain, and filling of ruts/rills with soil and/or crushed stone as needed for stabilization. All areas that require ground disturbance activities for maintenance will be reseeded to minimize soils loss and the potential for sediment runoff during rain events, and erosion control features will be monitored and repaired as needed. The recurrence of such activities will be dependent upon the operational tempo of training, and amount of damage incurred from training events as well as rain events and natural erosion processes, and vegetation growth rates. Long-term activities to maintain the LOS to the K15 targets will

consist of additional aerial herbicide applications, but the frequency will be dictated by rates of vegetative growth, and is approximated to occur every 15 – 20 years.

2.4.2 Alternative 2 (The Preferred Alternative)

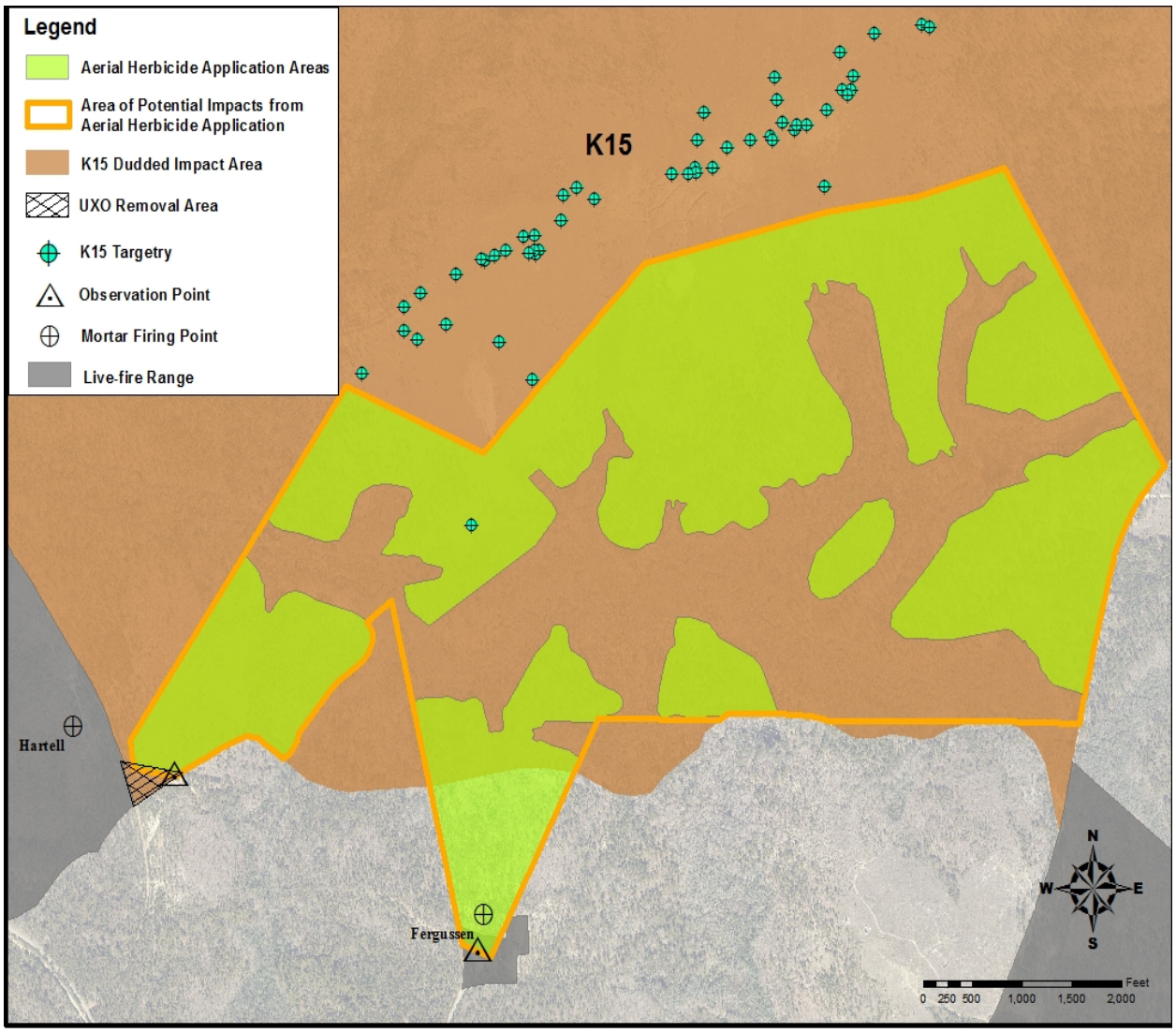
Under Alternative 2, all of the activities under Alternative 1 would be implemented for expansion of FPs, restoration of the LOS from the Concord/Fergusson and K36 Ranger Objective OPs to the K15 targetry, and long-term maintenance activities of the open field training environment and LOS. For Alternative 2, the Hartell Bunker would be re-established to provide an additional, operational OP to the southwest of the K15 impact area to support indirect fire training. The Hartell Bunker OP was inactivated due to vegetation overgrowth and its proximity to the southwestern boundary of the K15 dudded impact area. The vegetation overgrowths not only hindered the LOS to the targetry within the K15 impacts area, but also made it dangerous for Soldiers and personnel to identify the presence of UXOs in the area. For the Hartell Bunker OP to regain its full functionality, removals of both vegetation and UXO will be required.

Compared to Alternative 1, Alternative 2 would require aerial application of herbicide to an additional 75 acre area for timber/vegetation removals restore the LOS from the Hartell Bunker OP to targetry within the K15 impact area. This will result in the potential to apply aerial herbicide to 530 acres overall. Within this additional 75 acre area identified for aerial application of herbicide is approximately 3.5 acres that would potentially require land disturbing activities for UXO removals to ensure safe access and full functionality of the Hartell Bunker OP. The areas for aerial herbicide application and UXO removals are illustrated in Figure 8.

Preliminary assessment of the Hartell Bunker area indicate that there is a high potential for the presence of UXOs that prevent it from being safely utilized as an OP. As such, the Hartell Bunker area will require extensive surface and subsurface UXO surveys and removals to restore the area to a fully operational training site to ensure Soldier and other personnel safety. These surveys will be conducted by EOD, or by qualified contractors if EOD personnel are unavailable (e.g. deployment, training cycles, etc.). UXO management will be conducted in accordance with the Military Munitions Rule (MMR) under the Resource Conservation and Recovery Act (RCRA).

This is the Preferred Alternative for implementation due to the flexibility it provides the FO during indirect fire training exercises. The two primary OPs of Concord/Fergusson and the K36 Ranger Objective are located to the south and southeast of the K15 impact area. The re-establishment of the Hartell Bunker OP would give the FOs a location to the southwest to provide a full southern arc of LOS to aid in artillery and mortar training. Additionally, it would improve the safety of access to the area and could potentially serve other training functions in the future as POIs and missions change.

Figure 8. Alternative 2 - Proposed Area for Aerial Herbicide Application Area for LOS Restoration, and UXO Removal Area for the Hartell Bunker OP



Long-term maintenance activities for the open field training environment as identified in Alternative 1 would also be applicable to Alternative 2. After initial UXO removals are completed the Hartell Bunker OP area will continue to be a restricted access area based on its adjacency to the K15 dudded impact area. However, upon completion of live-fire events any dud munitions noted will be reported to EOD and Range Division to be marked and destroyed as a component of training and standard operating procedures for range clearance.

2.4.3 No Action Alternative

Under the No Action Alternative, present training operations and training land use would continue in their current state. Indirect fire positions and access trails would not be improved with grading and erosion control features. FPs would not be expanded to support current artillery and mortar weapon systems formations. LOS from the Concord/Fergusson and K36 Ranger Objective OPs to targetry in the K15 impact area would not be restored through tree removals. The Hartell Bunker OP would not be restored to

support indirect fires training, which would dismiss the need for additional tree removals for LOS to K15 targetry, and UXO removals for safety.

Under this Alternative, the ITAM program would conduct routine actions to maintain ranges, repair damage created by maneuver training or weather (e.g. rain events or tornadoes), and enhance off-road maneuver capabilities. Most activities would be within live-fire range footprints and/or localized in designated maneuver trails, off-road maneuver areas, and other currently established training assets such as MOUTs (that simulate urban or city environments) and bivouac sites for overnight field camping.

While the No Action Alternative would not satisfy the purpose or need for the Proposed Action, this Alternative was retained to provide a comparative baseline against which to analyze the effects of the Proposed Action, as required under the CEQ Regulations (40 CFR 1502.14). The No Action Alternative reflects the *status quo* and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

2.5 Alternatives Considered but Eliminated from Further Consideration

The following alternatives were considered during alternatives development but were eliminated from further consideration for reasons described in each section.

2.5.1 Use of Virtual or Gaming Software Platforms to Replace Live Field Training

While the increased use of virtual and constructive training can instill valuable lessons and teach tactics, techniques, and procedures, it cannot replace live training in a field environment. There are no systems within the Army's current inventory of virtual or gaming systems that can replicate or replace the field training tasks in the indirect fires and Airborne or Rangers' Program of Instruction. Live training remains critical to conduct indirect fires, Airborne parachute drops, and Rangers' rotary-wing insertion/extraction training. The use of only virtual or gaming software platforms are inconsistent with the Army's training doctrine.

2.5.2 Construct New Indirect Firing Positions at Other Locations

The establishment of artillery and mortar gun positions at new sites was considered, although specific sites were not evaluated. The construction of new sites would require identifying locations that meet all the requirements for artillery and mortar formations, and to be oriented to allow fire toward the K15 dudded impact area. Access to each new location, if not already present, would have to be established and each site would have to be evaluated to include enough clearing to allow the safe use of a six-gun artillery battery (a minimum of a 400- by 200-meter area), or a minimum of a 300- by 150 meter area for each mortar firing position. Subsequently, it was determined by Fort Benning Range Operations and the Environmental Management Division personnel that expanding the currently established firing positions would incur the least environmental impacts. As the majority of the current firing positions already have large open areas, or consist of scrub vegetation, the expansion and improvements to existing FPs allowed Fort Benning to minimize removals of current Red-cockaded Woodpecker (RCW) foraging habitat, and potentially suitable habitat for future RCW recruitment clusters. Additionally, as the existing FPs already have accessibility via unimproved trails, there would be no need to develop additional trails or access roads to new FPs, and thereby minimizing the potential impacts from additional vegetation removals and land disturbances that could potentially impact soil erosion and water resources.

This Alternative was eliminated from further consideration because the potential impacts to environmental resources would substantially exceed those resulting from the expansion and improvements proposed to the currently established FP locations on Fort Benning.

2.6 Potential Effects of the Proposed Action and Alternatives

The existing condition of the environmental resources, the potential affect on each of the Alternatives, and mitigation for adverse impacts are presented in Section 3.0. Section 4.0 presents an analysis of each Alternative's potential cumulative environmental effects to each environmental resource area, or Valued Environmental Component (VEC).

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes the affected environment of Fort Benning and the surrounding area along with the potential environmental direct and indirect impacts of the Alternatives. The description of existing conditions provides a baseline understanding of the resources from which any environmental changes that may result due to the implementation of an Alternative can be identified and evaluated. Following the existing conditions, potential changes or impacts to the resources are described as environmental consequences for each Alternative are presented, and any mitigation measures identified to reduce potential impacts. The Region of Influence (ROI) varies among resources and defines the geographic extent of potential effects from the Alternatives on the important elements of that resource.

The CEQ defines direct effects as those that are caused by the Proposed Action and occur at the same time and place; indirect effects are caused by the Proposed Action and are later in time but are still reasonably foreseeable (40 CFR Part 1508.8). Impacts are characterized in this EA as:

Beneficial: A positive impact.

Adverse: A negative impact.

Negligible: The term used to indicate an environmental impact that could occur but might not be perceptible.

Minor: The term used to indicate an environmental impact that clearly would not be significant but probably is noticeable.

Moderate: The term used to indicate an environmental impact that is not significant but is readily apparent, where predicted consequences of implementing the Proposed Action suggest the need for additional care in following standard procedures, or applying precautionary measures to minimize impacts.

Significant: An adverse environmental impact, which given the context and intensity, violates or exceeds regulatory or policy standards or otherwise exceeds the identified threshold. A significant impact, however, may be mitigated to less than significant.

Direct: Caused by the action, occurring at the same time and place

Indirect: Caused by the action and foreseeable, but occurring at a later time or different place

Cumulative: The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Significance thresholds are also described for each resource at the beginning of each environmental consequences discussion. CEQ guidelines indicate that the significance of an impact is determined by the intensity and the context of the impact. Intensity refers to the severity or extent of the impact, and context relates to the environmental circumstances at the location of the impact. Significance thresholds were

developed in consideration of CEQ's guidance to determining significance (40 CFR Part 1508.27).

Impacts also are characterized as short-term or long-term. Short-term effects typically are those that would be temporary and associated with the construction phase or maintenance activity, but would no longer be perceptible once construction and/or maintenance is completed. Long-term effects are those that would be permanent or would persist for the operational life of the implemented project.

3.1.1 Valued Environmental Components

The U.S. Army Environmental Command (USAEC) *NEPA Analysis Guidance Manua*l (USAEC 2007) provides information on identifying valued environmental components (VECs), which are those resources that are considered to be important by society and potentially at risk from human activities or natural hazards. There are 14 VECs recommended for consideration by the AEC Army NEPA Analysis Guidance Manual. For the purposes of this EA, some resources areas identified in the AEC manual have been combined with similar resource topics to focus and consolidate the discussion on potential impacts. The VECs presented in this EA are listed below:

- Air Quality
- Airspace
- Biological Resources
- Cultural Resources
- Energy and Utilities
- Facilities and Infrastructure
- Hazardous and Toxic Materials and Waste
- Land Use
- Noise
- Safety
- Geology and Soils
- Socioeconomics, Environmental Justice and Protection of Children
- Traffic and Transportation
- Water Resources

3.1.2 VECs Not Carried Forward for Analysis

The CEQ encourages federal agencies "to concentrate on relevant environmental analysis in their EAs and EISs, not to produce an encyclopedia of all applicable information. Environmental analysis should focus on significant issues, discussing insignificant issues only briefly. Impacts should be discussed in proportion to their significance, and if the impacts are not deemed significant there should be only enough discussion to show why more study is not warranted" (CEQ 2012).

Outlined below is the rationale for exclusion of those VECs that would involve no or negligible impacts, or involve no important issues of concern resulting from the implementation of the Action Alternatives. Accordingly, this section briefly describes those VECs that are not carried forward for further study.

- **Airspace** – Air activities include rescue/medical evacuation, parachute drop, surveillance, reconnaissance, and/or equipment drops. Other activities that require "Special Use Airspace" (SUA) include close air support (i.e. aerial gunnery), and artillery/mortar live-fire exercises (i.e. indirect fires). The Proposed Action and Alternatives will not involve changes to current airspace class designations, or training operations for the Airborne School, Rangers, or indirect fires units. There

will be no increase in permanently stationed aircraft at the Installation, and no changes to current designated aviation routes or operational airspace.

Airspace will continue to be regulated by the Federal Aviation Administration (FAA) through implementation of FAA Order 7400.2G, *Procedures for Handling Airspace Matters* (USDOT 2008), and FAA Order 7610.4 *Special Operations*. Fort Benning will continue to manage the airspace regulated by the FAA in accordance with FAA Orders and DoD Directive 5030.19, *DoD Responsibilities of Federal Aviation* (DoD 2013), and Army Regulation 95-2, *Air Traffic Control, Airfield/Heliport, and Airspace Operations* (US Army 2016). Procedures for notifying non-military aircraft within Fort Benning's geographical area of range activations and live-fire exercises will continue per FAA reporting requirements via a "Notice to Airmen" alert for to minimize airspace conflicts. As there are no changes to airspace classifications, no changes to training operations, and no changes in airspace management protocols or regulations, airspace is not analyzed further in this EA.

- **Cultural Resources** – The Proposed Action would not involve the disturbance of any historic properties (e.g. archaeological sites or architectural structures) eligible for listing on the National Register of Historic Places per the National Historic Preservation Act (NHPA). Additionally, there would be no disturbance of any cultural items as defined in the Native American Graves and Protections and Repatriation Act; and full access to any sacred sites as defined in the American Indian Religious Freedom Act per Executive Order (EO) 13007 would continue per consultation agreements with the Native American Tribes that have a historical affiliation with the Fort Benning area.

  There are a number of existing ineligible historic properties within the current FP footprints, and/or will be within the proposed FP footprint after expansion. The NHPA does not require avoidance of ineligible historic properties during construction, training or maintenance. Because these areas have been previously disturbed and are active training areas, there will be no additional impacts to these historic properties that have already been assessed by Fort Benning's Cultural Resources Program archaeological surveys. The same holds true for the existing DZ/HLZ/PZ areas identified in this document for maintenance activities; i.e. only ineligible historic properties are present within some of their boundaries. These areas are also previously disturbed and actively used for training. Continued maintenance and operations would not incur any new or additional impacts to cultural resources.

  Archeological surveys have not been conducted within areas designated as munition impact/dudded areas due to human health and safety concerns. If historic properties do exist within the K15 impacts area, the aerial application of herbicide is not expected to incur any impacts to such properties as there are no land disturbances associated with these vegetation removals. However, compliance with Section 106/110 of the NHPA may require subsequent site evaluation following UXO clearance activities to restore the Hartell OP. Fort Benning's Cultural Resources Programs will review all proposed ground disturbing activities through the NEPA, FB-144R review process, and determine the need for site surveys and data recovery (if required) after UXOs have been removed. Therefore, impacts to cultural resources are not discussed further in this EA.

- **Land Use** – The Proposed Action is limited to the training areas and do not involve a change in land use category codes, nor would cause a significant change in training operations. Also, there would be no construction of new DZs, HLZ/PUZs, or FP locations within the currently established maneuver training areas. Therefore, land use is not analyzed further in this EA.

- **Energy and Utilities** – The Proposed Action is limited to the training areas and do not involve changes to utilities or energy demands. Utilities on Fort Benning have been privatized, and all are capable of supporting the Proposed Action. As there are no increase in energy demands or need for utility upgrades or expansion, energy and utilities are not analyzed further in this EA.

- **Facilities and Infrastructure** – The Proposed Action is not anticipated to affect any facilities or infrastructure other than those described in the Proposed Action for improvements to FPs and access roads, the re-establishment of the Hartell OP Bunker, or the long-term maintenance activities required for safety and functionality of FPs, Ops, and DZ/LZ/PZs. The related potential impacts in other resource areas are discussed in this EA in Sections 3.2 through 3.7. As there are no substantial changes to current facilities and infrastructure beyond improvements to field assets to support training, this subject is not analyzed further in this EA.

- **Noise** – Fort Benning Operations Noise Contours are generated primarily by military aircraft and live-fire exercises of various weapons systems, and currently extend to areas outside of the Installation boundary. Fort Benning' *Installation Operational Noise Management Plan* outlines policies and procedures for managing noise impacts to the surrounding communities. These planning efforts encourage nearby communities to adopt ordinances that promote land use that is compatible with noise produced at Fort Benning. Fort Benning also implements noise complaint procedures to address individual concerns as they arise, and investigated to determine the appropriate corrective action. Additionally, Fort Benning will forewarn the public through various notices when large-scale culminating exercises or specialized training events will occur that may be perceived as an increase in noise levels.

  The Proposed Action is not anticipated to change or increase current off-Post noise contours, not even for large caliber weapons fire. There would be no increase in potential impacts to sensitive receptors (e.g. housing, schools, churches, hospitals, etc.), from the Proposed Action. In the short-term there may be localized noise from the use of heavy construction and timber removal equipment, but that would occur in training areas that are often subject to training-related noise; therefore, there would be no increase in noise. This subject is not analyzed further in this EA because there would be no impacts to noise.

- **Safety –** *The Army Safety Program*, AR 385-10 (U.S. Army 2000), governs Army policies, responsibilities, and procedures to protect and preserve Army personnel and property against accidental injury, loss of life, or damage, and assesses the potential for risks to mission, personnel, equipment, and the environment. The regulation provides for operational safety, safe and healthy work places, and assures compliance with applicable safety laws and regulations.
  All field training exercises will be conducted in accordance the MCoE Regulation 350-19 (*Range and Terrain Regulation*). This regulation provides procedures for the management of training land, ranges, and air space assets, and is applicable to all units and activities conducting training on Fort Benning. Range Safety covers prevention of accidents on Army ranges. AR 385-63, *Range Safety*, (U.S. Army 2003), prescribes policies and responsibilities for ranges on the use of live firing of small arms, rockets, guided missiles, and lasers, while providing guidance for non-authorized activities and personnel within exclusion areas, known as Surface Danger Zones (SDZs), when ranges are in use for live-fire training exercises. Aviation Safety involves all safety aspects of aircraft operations and responsibilities for personnel working in or around aircraft such as pilots and crew or maintenance personnel as well as individuals flying aboard aircraft. *Army Aviation Accident Prevention*, AR 385-95 (U.S. Army 1999), details the responsibilities and policies regarding aviation safety.

Construction and maintenance activities at Fort Benning performed or contracted by the United States Army Corps of Engineers must follow the *USACE Safety and Health Manual* 386-1-1 (USACE 2003b). This manual outlines all of the requirements to comply with Occupational Safety and Health Administration (OSHA – 29 CFR 1910) standards during the construction process, and future maintenance activities. Workplace Safety applies to on-the-job safety and implements the requirements of OSHA that include protective clothing and equipment, hazard materials communication, health and safety standards, reporting requirements, and a myriad of other requirements designed to protect the health and safety of workers.

The Fort Benning military and civilian personnel and the community are routinely advised and reminded not to handle any suspected UXO, and to report suspicious ordnance to the Explosive Ordnance Detachment and to the Director of Public Safety through calling 911. Access into temporary and/or dedicated impact areas will be strictly controlled. Those portions of temporary and dedicated impact areas authorized for training or other authorized personnel will be surface cleared of UXO before access is permitted. Minimum safety distances for explosives will be strictly adhered to. DoD response actions to address UXO must comply with these standards and other applicable DoD policies and with applicable Federal, State, interstate, and local laws and regulations, and any enforceable agreements.
The Proposed Action will not result in changes to, or deviate from any of the standard operating procedures as mandated from any of the regulations as discussed above. Therefore, safety will not be discussed further in this EA.

- **Socioeconomics, Environmental Justice and Protection of Children** – In 1994, President Clinton signed EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires Federal agencies to identify any disproportionately high and adverse human health or environmental effects on low income and/or minority communities. As the Proposed Action is limited to the established training areas of Fort Benning, there would be no effects to minority or low-income populations. There are no effects to Environmental Justice issues; therefore, that topic is not further discussed in this EA.

  In 1997, EO 13045, *Protection of Children From Environmental Health Risks and Safety Risks*, was signed by President Clinton to prioritize the identification and assessment of environmental health and safety risks that may affect children, and to ensure that Federal agencies' policies, programs, activities, and standards address these environmental and safety risks to children. The potential of the Proposed Action to cause environmental and safety risks to the school age population of Fort Benning and the surrounding community is negligible. As all construction, maintenance, and training activities will take place in established training areas, no effects to children would occur. Therefore, there are no effects to Protection of Children, and it will not be discussed further in this EA.

  The Proposed Action may have a short-term, beneficial effect on the local economy only during construction activities. This includes the potential for additional jobs and subsequent increased local spending by the workforce. None of the Action Alternatives would induce long-term population growth within the Installation or the surrounding communities, nor have an adverse effect on housing. Long-term maintenance activities would be conducted by base operations contractors and/or the ITAM program. The socioeconomic effects from this Proposed Action would be negligible. Therefore, socioeconomics have been eliminated from further discussion in this EA.

- **Traffic and Transportation** – Traffic and transportation includes the roadway system and traffic

conditions for the roadway network serving Fort Benning. Fort Benning's on-Post road network is comprised of primary, secondary, and tertiary roadways. Secondary and tertiary roadways in the region mostly serve the Installation's Cantonment areas located in the western portion of the Installation. In addition to this road network for vehicular traffic, a secondary trail network is used by tanks and other military vehicles to access training areas. Combat vehicles regularly use this separate system of tank trails to move between the cantonments, maintenance, and training areas. These improved trails have different design characteristics that include wider lanes, stronger structure, and harder materials to accommodate wider and heavier vehicles and different traction systems. Many other roads and trails within the training areas consist of unimproved dirt roads. The Proposed Action does not include an increase of military vehicles, no new road construction, or changes in standard operating procedures for road closures during live-fire training exercises, traffic and transportation will not be discussed further in this EA.

3.2 VECs Carried Forward for Analysis

After consideration of the anticipated impacts associated with the Alternatives, the following VECs were selected to be carried forward for detailed analysis in this EA: Air Quality; Hazardous and Toxic Materials and Waste; Biological Resources;; Geology and Soils; and Water Resources.

3.2.1 Air Quality

3.2.1.1 Affected Environment

The air quality ROI consists of Fort Benning and the Columbus-Phenix City Interstate air quality control region (AQCR). Muscogee, Chattahoochee, Russell, Harris, Talbot, Marion, Webster, and Stewart counties are all within the Columbus-Phenix City AQCR. In compliance with the 1970 Clean Air Act (CAA) and the 1977 and 1990 CAA Amendments, the United States Environmental Protection Agency (USEPA) has promulgated National Ambient Air Quality Standards (NAAQS). The NAAQS were enacted for the protection of the public health and welfare, allowing for an adequate margin of safety. To date, the USEPA has issued the NAAQS for the following criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (particles with a diameter less than or equal to a nominal 10 micrometers [PM_{10}] and particles with a diameter less than or equal to nominal 2.5 micrometers [$PM_{2.5}$]), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb). EPA Region 4, the Alabama Department of Environmental Management (ADEM), and the Georgia Department of Natural Resources' Environmental Protection Division (GAEPD) regulate air quality on Fort Benning. Fort Benning has been designated by the USEPA to be in attainment for all required standards for criteria pollutants, (except Pb in a limited area off the Installation in Muscogee County around a battery plant [USEPA 2014a]). Additionally, the region is considered to be in attainment for O_3, based on the 2015 primary and secondary standards. Motor vehicles (mobile sources) are a primary contributor to ground-level O_3 levels in Georgia.

Greenhouse Gases. There is broad scientific consensus that humans are changing the chemical composition of earth's atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use, are resulting in the accumulation of trace greenhouse gases (GHGs). The EPA made an endangerment finding stating that "current and projected concentrations of the six key well-mixed greenhouse gases (GHGs) (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations" (EPA 2014). This finding resulted in the regulation of GHG emissions published in 75 Federal Register (FR) 31514 (3 June 2010), which led to what is known as the prevention of significant deterioration (PSD) and Title V GHG Tailoring Rule (FR 2010). For the purposes of PSD

and Title V, this rule has set a major source emission threshold of either 75,000 or 100,000 tons per year of carbon dioxide equivalent (CO2e) depending upon circumstances (FR 2010).

GHG emission sources at Fort Benning include vehicle use, boilers, chillers, water heaters, and emergency generators. Fort Benning is classified as major stationary source and has a Title V permit, but the Proposed Action would either maintain or reduce GHG emissions. Because there would not be an increase of GHG emissions by at least 75,000 tons per year, the Tailoring Rule does not apply to this Proposed Action and will not be evaluated further in this EA.

Fort Benning operates under an Installation-wide Title V Permit for various stationary sources throughout the Installation (Permit No.: 9711-215-0021-V-03-0; 12 March 2014). Fort Benning currently has 11 boilers that are greater than 10 million British thermal units per hour each, and hundreds of smaller boilers or heaters. Most units fire natural gas and liquefied petroleum gas (Georgia Department of Natural Resources 2014). Because no generators or other stationary sources would be added, and there would be no changes to the Title V permit, it will not be studied further in this EA.

Military installations are required to estimate air pollution emissions from range operations for several reasons that include preparation of air emission statements and Title V permits, as well as reporting requirements under the Emergency Planning and Community Right-to-Know Act (EPCRA). Primary emissions from ordnance detonation and small arms fire are CO, CO2, and PM. Ultralow levels of methane, lead, and other hazardous air pollutants are also be emitted, however, live-fire training activities are generally insignificant sources of hazardous air emissions as compared to stationary sources. Although there could be the potential for an increase in artillery training exercises after FP expansions, the inactivation of the 3rd ID and reduced impacts from training would counter the potential for an increase in hazardous air emissions and PM. As there are no impacts to regional air quality expected from training activities at Fort Benning, this will not be discussed further in this EA.

Georgia also requires compliance with Georgia's Fugitive Dust Rule, which stipulates that reasonable precautions are implemented to prevent fugitive dust from becoming airborne and that fugitive dust opacity remain below 20 percent. In its letter dated 21 April 2003, the Georgia Department of Natural Resources confirmed that burning, firing, impact of ordnance and resulting explosions as well as the use of vehicles and equipment in military training and exercises on ranges and unpaved roads and trails are not subject to the Fugitive Dust Rule (Reheis 2003). Construction and maintenance activities will follow the Fugitive Dust Rule and other applicable air quality requirements.

Fort Benning also generates emissions from prescribed fire activities as part of its ongoing ecosystem management program. Prescribed burning is the largest single source of criteria pollutant emissions on the Installation (U.S. Army 2013). However, it is a critical management tool for fire-dependent natural communities, RCW habitat, and training area management. Approximately 35,000 acres per year are subjected to prescribed burning events, with an average return interval of every 1-3 years (Parker 2017). During prescribed burns, "burn units" are identified utilizing natural features such as rivers, creeks, roads, trails, and established firebreaks to designate the boundaries of the area to be burned. Burn units range in size from 200 to 600 acres with an average of 275 acres (Fort Benning 2015a).

In addition to prescribed burning, RCW habitat management and enhancement will involve the application of herbicide to forest stands. Typically aerial herbicide applications on Fort Benning have focused on hardwood overstory removals in order to control invasive species and to promote longleaf pine restoration, which is then augmented with a burning event. Herbicide applications are also used in conjunction with site preparation burns for planting of longleaf plantations, and subsequently enhance RCW habitat for the future.

The prescribed burning activities on Fort Benning also reduces impacts from wildfires. Wildfires can be caused by natural event (e.g. lightning strikes), or training exercises (e.g. munitions). Regular burning maintains low fuels levels which minimizes the occurrences and severity of wildfires, as well as the amount of smoke. Wildfires are generally left to burn, but are monitored to ensure that they are contained within appropriate, manageable boundaries, and do not jeopardize military or civilian personnel or assets, smoke sensitive areas (e.g. housing areas, hospitals, etc.), or ecologically unique areas and endangered species. Wildfires in duded impact areas are allowed to due to UXO concerns, but are intensely monitored at the perimeter for spreading, and may be contained by scraping existing roads or re-plowing firebreaks that surround them. Wildfire management is a collaborative effort between military personnel, the Fort Benning Fire Department, and the Natural Resources Management Branch.

The Georgia and Alabama Forestry Commissions administer each state's Smoke Management Plan (SMP), which details the procedures and requirements for managing smoke from prescribed fires. The purpose of each Smoke Management Plan is to minimize the public health and environmental impacts of smoke intrusion into populated areas from fires, avoid significant deterioration of air quality and potential CAA violations, and avoid visibility impacts in Class I prevention of significant deterioration (PSD) areas (U.S. Army 2013). The closest PSD Class I areas are the Sipsey Wilderness Area, Alabama, as well as Cohotta, Wolf Island, and Okefenokee Wilderness Areas, Georgia. All of these Class I areas are located more than 200 miles away, and it would be unlikely that they would be affected by emissions generated at Fort Benning; therefore, PSD is not further considered in this air quality analysis.

3.2.1.2 Environmental Consequences

Any impacts to air quality in attainment areas would be considered significant if pollutant emissions associated with the proposed action caused a violation of the CAA and/or cause an exceedance of an established air quality standard.

3.2.1.3 No Action Alternative

Under the No Action Alternative, present training operations and training land use would continue in their current state. Indirect fire positions and access trails would not be improved with erosion control features. FPs would not be expanded to support current artillery and mortar weapon systems formations. LOS from the Concord/Fergusson and K36 Ranger Objective OPs to targetry in the K15 impact area would not be restored through vegetation removals. The Hartell Bunker OP would not be restored to support indirect fires training, which would dismiss the need for additional vegetation removals for LOS to K15 targetry, and UXO removals for safety. General maintenance activities under the ITAM program would continue to be implemented to support doctrinal training requirements in accordance with the Army's Sustainable Range Program (SRP).

Existing emissions levels are expected to continue. Mobile sources, including vehicle emissions, would continue, including personal vehicles and both wheeled and tracked vehicles. There would be no change to prescribed burning activities or the aerial application of herbicide for invasive vegetation controls and RCW habitat enhancements. Fort Benning will continue to minimize smoke impacts from prescribed burns and wildfires through compliance with guidelines in the SMPs, and adherence to air quality impact minimization procedures. Prescribed burning will be conducted under favorable weather conditions that allow for the minimization of smoke impacts on sensitive receptors. The No Action Alternative would continue to have an overall minor, adverse impact on air quality.

3.2.1.4 Alternative 1

Under Alternative 1, FPs and access trails would be improved with erosion control features, and FPs would be expanded to support current artillery and mortar gun formations resulting in the potential for approximately 315 acres of vegetation removals and land disturbing activities. Short-term, minor impacts to air quality from vehicle emissions and fugitive dust could potentially occur due to the use of heavy equipment in support of vegetation removals, construction of erosion control measures, and grading activities. In the long-term, the effects to air quality would be minor, adverse due to the potential for fugitive dust and emissions from heavy construction equipment used for the maintenance activities to sustain the functionality of FPs, FP access trails, and DZ/HLZ/PZs.

Per the ITAM work plan, it is anticipated that OPs and HLZ/PZs would require grading and removal of encroaching vegetation twice a year. FPs are anticipated require a more frequent maintenance schedule (up to six times a year), due to the towing of artillery pieces and general wheeled vehicle damages (pers. com. Van Allen 2017). However, the recurrence of such activities will be dependent upon the operational tempo of training, the amount of damage incurred from training events, as well as rain events and natural erosion process, and vegetation growth rates. The frequency of aerial application of growth retardant herbicide to Fryar DZ to maintain grass heights would be dependent upon natural factors such as rain events, climate, drought, etc., that influence emergence of vegetation. This is also dependent upon the scheduling and timing of mowing/bush-hogging that may not be able to keep pace with peak growing seasons.

Aerial application of herbicides for vegetation growth control on Fryar DZ (approximately 1,500 acres as illustrated in Figure 1), and vegetation removals for LOS restoration (approximately 455 acres as illustrated in Figure 7) capabilities of the Concord/Fergusson and K36 Ranger Objective OPs could result in limited amount of herbicide released into the air, resulting in site-specific air quality impacts during or shortly after the application of herbicides. The potential for inadvertent dispersal of herbicides into the air under adverse weather conditions would exist. However, pesticides would be applied within the designated range of wind speeds, and would not be applied within certain timeframes of forecasted rain events per the product label. Additionally, all herbicide applications would be conducted in accordance with Fort Benning's IPMP and action specific ASSON. Therefore, there would be potential short-term, minor impact to local and regional air quality from the aerial application of herbicides.

The application of herbicide to restore the LOS capabilities of the Concord/Fergusson and K36 Ranger Objective OPs could potentially increase the occurrence of a wildfire. Over time as the trees die they will drop their leaves, smaller branches and outer bark layers, and lose their tops, subsequently increasing the amount of plant litter on the ground to fuel a wildfire. As wildfires in dudded impact areas are relatively common due to munitions, the impacts of smoke from a wildfire occurring in the aerial herbicide application area would be comparable. In addition, the potential acreage to be affected by the herbicide application is within the size of burn units established (200 to 600 acres) for implementing prescribed burns across the Installation.

The burning of herbicide treated vegetation will not cause any additional impacts to air quality. Studies from Forest Service vegetation management programs have shown that the burning of woody vegetation that has been treated with herbicides does not substantially affect air quality (SERA 1996). The most common classes of herbicides for treatment of woody vegetation bind with the plant tissues and/or bind with soils matter after application. Any herbicide not directly taken up by plant tissue or bound in soil particles is subject to degradation in the environment over time. In addition, RCW habitat management and enhancement through a combination of herbicide application and prescribed burning is a standard practice on Fort Benning. Therefore, the burning of herbicide treated vegetation from a potential wildfire

will not cause any additional impacts to air quality, but will continue to be minor, adverse in the short- and long-term.

Fort Benning will continue to minimize smoke impacts from prescribed burns and wildfires through compliance with guidelines in the SMPs, and adherence to air quality impact minimization procedures. Prescribed burning will be conducted under favorable weather conditions that allow for the minimization of smoke impacts on sensitive receptors.

Overall, Alternative 1 would have minor, adverse impacts to Air Quality from construction, maintenance activities, prescribed burning, and wildfires.

3.2.1.5 Alternative 2 (The Preferred Alternative)

All impacts to Air Quality identified above for Alternative 1 would be applicable to Alternative 2. Discussion of potential additional impacts from implementation of Alternative 2 are discussed below.

As with Alternative 1, the expansion of the existing FPs could incur approximately 315 acres of vegetation removals and land disturbances within the proposed footprints for Alternative 2. However, there would be additional vegetation removals to also restore the functionality of the Hartell Bunker OP and its LOS to the K15 targetry. Aerial application of herbicide would be needed on an additional 75 acres of pine and hardwood species, resulting in the removal of approximately 530 acres of vegetation, as illustrated in Figure 8. This 530 acres of vegetation removals through aerial application of herbicide would restore LOS for the Concord/Ferguson and K36 Ranger Objective OPs, (as identified in Alternative 1), as well as the Hartell Bunker OP LOS.

Restoration of the Hartell Bunker OP itself would potentially impact an additional 3.5 acres of vegetation to conduct UXO removals to ensure safe access and functionality of the OP. UXOs within this area will be “blown-in-place”, which could damage and/or destroy vegetation at that location or in close proximity. At the time of this analysis, it is unknown of the amounts and severity of UXO in this area, but any UXO found will be detonated in place as this is considered the safest form of removal. Primary emissions from ordnance detonation are CO, CO2, and PM. Ultralow levels of methane, lead, and other hazardous air pollutants are also be emitted, but are an insignificant source of hazardous air emissions as compared to stationary sources. UXO removals will not violate any air quality standards currently in place, nor have any impacts to regional air quality. Any air quality impacts would be localized, and minor in the short-term.

Overall, Alternative 2 would have minor, adverse impacts to Air Quality from construction, maintenance activities, potential wildfires, and UXO removals.

3.2.1.6 Mitigation Measures

Adherence to Federal and State laws and Army regulations, and other Installation management plans such as the IPMP and INRMP, would minimize impacts due construction, training, and maintenance operations activities in the short- and long-term. Therefore, no additional mitigation measures are warranted.

3.3.1 Hazardous and Toxic Materials and Waste

3.3.1.1 Affected Environment

Hazardous materials and waste are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Occupational Safety and Health Act; the Resource Conservation and Recovery Act (RCRA); the Federal Insecticide, Fungicide, and Rodenticide Act; and the Emergency Planning and Community Right-to-Know Act. The Clean Water Act also addresses hazardous materials and waste through Spill Prevention, Control, and Countermeasure (SPCC) and NPDES requirements.

The EPA defines hazardous waste in the RCRA Regulations as any "solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that could or do pose a substantial hazard to human health or the environment." Waste may be classified as hazardous because of its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are "listed" or identified as hazardous (40 CFR 261 through 263). Toxic substances that commonly occur on Army installations include asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs), and radon, but are not involved with the Proposed Action of this EA, and therefore will not be discussed further in this EA.

Herbicides used in accordance with EPA guidance and product label specifications are not considered hazardous waste. However, most herbicide residuals, herbicide containers, wastes from herbicide mixing, and any material that comes in contact with the herbicide may be considered hazardous waste if it meets the EPA criteria. All herbicides used for vegetation management on the Installation are used, stored, and disposed of in accordance with the Installation's Hazardous Waste Management Plan (HWMP), IPMP, INRMP, and in accordance with EPA guidance and product label. The herbicide proposed for use in aerial application would be brought on site by the contractor and would not be stored on the Installation.

The Federal Facility Compliance Act, signed into law in 1992, contained provision 107 requiring the U.S. EPA (EPA), in conjunction with the Secretary of Defense and appropriate State officials, to develop regulations to define the point at which conventional military munitions become hazardous waste and to provide for the safe transport and storage of such waste under the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. section 6924 subsection 3004y). Since 1992, EPA has consulted with DoD, the Department of Defense Explosives Safety Board (DDESB), States, and various environmental interest groups on this regulatory initiative, culminating in the "Military Munitions Rule: Hazardous Waste Identification and Management; Explosives Emergencies; Manifest Exemption for Transport of Hazardous Waste on Right-of-Ways on Contiguous Properties; Final Rule" published in the 12 February 1997 Federal Register. The effective date of the rule was 12 August 1997.

Under the Military Munitions Rule, munitions used in the training of military personnel and explosive ordnance disposal (EOD) personnel are not considered a waste under RCRA. The military Services often conduct range clearance exercises as a component weapons testing and/or field training exercises. During these exercises, military EOD specialists clear ranges of debris and unexploded ordnance. No known unexploded ordnance are left in place at the conclusion of a training exercise, and are destroyed where they are found, unless it is within a sensitive area such as a cultural resources site. The frequency of these range clearance activities differs according to the nature of the area within the range, and operational tempo. For example, range areas known as maneuver zones, where tanks, other vehicles, and personnel are present are generally cleared more frequently than range impact areas. The Army considers range management to be a necessary part of the safe use of munitions for their intended purpose; thus, the range clearance activity is an intrinsic part of training or testing (MCoE 350-19, 2016).

In addition, as part of the Operational Range Assessment Program (ORAP) and DoD requirements (DoDI 4715.14), all the ranges at Fort Benning were assessed to determine whether a release, or substantial threat of release, of "munitions constituents of concern" (MCOC), which refers to the chemical constituents of military munitions that remain in the environment, including residuals of explosives that may pose a potential threat to human health and the environment through their toxic properties. The results of the ORAP Assessment confirmed there are no unacceptable risks to off-range human and/or ecological receptors from potential MCOC sources associated with the operational footprint at Fort Benning. Per DoD Instruction 4715.14. All operational ranges must be re-evaluated every 5 years to determine if there is a release or substantial threat of a release of MCOC munitions constituents of concern from an operational range to an off-range area. If future studies identify that there has been a release that creates an unacceptable risk to human health or the environment, corrective actions will be implemented in accordance with applicable Federal, state, and Army regulations to mitigate any potential impacts.

The ROI for hazardous and toxic materials and waste (HTMW) includes the entirety of Fort Benning. Routine operations on Fort Benning require the use of a variety of hazardous materials which might include ordnance, antifreeze, degreasing solvents, cleaners, fertilizer, and pesticide (to include herbicide). These and other products are necessary to perform vehicle and equipment maintenance, conduct military training activities, and perform training area maintenance and repairs.

3.3.1.2 Environmental Consequences

Impacts of HTMW would be considered significant if they present an unacceptable risk of release of hazardous materials/wastes that could create a potential public health hazard, if the use of herbicides are not conducted in accordance the EPA approved label instructions, and/or if existing storage and disposal facilities could not adequately serve the waste handling requirements.

3.3.1.3 No Action Alternative

The No Action Alternative would not change the baseline conditions for management of hazardous materials, toxic substances, or hazardous waste at Fort Benning. Fort Benning would continue to minimize any adverse impacts of hazardous materials and waste by following all applicable laws, regulations, and Fort Benning's Hazardous Waste Management Plan. There would be no temporary increases in HTMW from additional heavy equipment for construction activities, and no temporary increase in herbicide application for timber removals to restore LOS to K15 targetry from the Concord/Fergusson, K36 Ranger Objective, or Hartell Bunker OPs. The Hartell Bunker OP would not be restored, eliminating the need for site specific UXO removals, and therefore would have no impacts on HTMW.

There could be continued potential long-term, minor adverse impacts from the application of herbicides for invasive species and for the restoration of the longleaf pine ecosystem to support RCW habitat enhancements. Aerial herbicide applications for RCW habitat management would continue to be approximately 2,100 acres annually, whereas acreages for herbicide application to control invasive species are more variable (Fort Benning 2015a). The types and quantities of herbicide used are dependent upon the target species to eradicate, and the application rates as prescribed by the manufacturer's label, EPA guidance, and Fort Benning's IPMP. For application sites in close proximity to water resources, only chemicals approved for use in and around water will be used to minimize the potential for contamination of water resources.

In the short-term, there could be minor, adverse impacts due to presence of gas-powered, large maintenance equipment and the potential for spills Fort Benning has developed an Integrated

Contingency Plan (ICP) to meet the Federal, state and Army requirements for spill prevention, response, and reporting requirements. Within the ICP are Activity Specific Plans (ASP) for unit areas that have the potential to cause a release of POL, HM or HW to the environment. The ICP also contains the Installation Spill Contingency Plan (ISCP) and complies with the requirements set forth in 40 CFR 109 and 40 CFR 112 for Spill Prevention, Control, and Countermeasures Plans. Units/activities will maintain adequate and appropriate stocks of spill control supplies to handle their HW or material spills.

Overall there would continue to be a long-term, minor adverse effect to HTMW based on everyday military operations to include military vehicle maintenance and maintenance for training areas.

3.3.1.4 Alternative 1

All management activities for HTMW as discussed above for the No Action Alternative would continue to be implemented under Alternative 1.

Under Alternative 1, the expansion and erosion control improvements to FPs and access trails could potentially result in short-term, minor adverse effects to HTMW. The quantity of hazardous materials such as petroleum, oil, and lubricants would increase due to the use of heavy equipment in support of vegetation removals and land disturbing activities at the FP locations in the short-term. In the long-term, the effects to HTMW such petroleum, oils, and lubricants would be minor, adverse due to presence of large, gas-powered equipment for regular maintenance activities to sustain the functionality of FPs and access trails. Although there could be the potential for an increase in artillery training exercises after FP expansions, the inactivation of the 3rd ID and reduced impacts from training would counter the potential for an increase HTMW generation.

Vegetation removals through aerial herbicide application to restore LOS from the Concord/Ferguson and K36 Ranger Objective OPs to the K15 targetry will require the treatment of approximately 455 acres. Aerial applications of growth retardant herbicide for Fryar DZ will require the treatment of approximately 1,500 acres. Herbicides proposed for aerial application would be the least toxic and least persistent herbicides for vegetation removal and growth control. Aerial application herbicides would not be stored or disposed of on the Installation. All contractor personnel handling the herbicides must be properly trained and/or credentialed on the proper handling and use of the specific herbicide being used. Actual amounts of herbicide to be applied will be dependent upon the herbicide chosen for use and the application rates as prescribed by the EPA registered herbicide label.

In the short-term, restoration of the LOS to the K15 targetry may require more than one aerial application of herbicide. This will be dependent upon the effectiveness of the herbicide used as the target species are diverse, (e.g. pine and hardwoods), and desired results. Long-term activities to maintain the LOS to the K15 targets will consist of additional aerial herbicide applications, but the frequency will be dictated by rates of vegetative growth, and is approximated to occur every 15 – 20 years (pers. com. Thornton 2017). The frequency of aerial application of growth retardant herbicide to Fryar DZ to maintain grass heights would be dependent upon natural factors such as rain events, climate, drought, etc., that influence emergence of vegetation, and the scheduling of mowing/bush-hogging that may not be able to keep pace with peak growing seasons.
Aerial application of herbicide would result in a short-term, minor adverse effect to HTMW with a temporary increase of the quantities of herbicide required for application, increased potential for spills, and a temporary increase in herbicide residuals such as rinse waters and product containers. Potential impacts of HTMW to soils and water resources from military operations, maintenance activities, and herbicide applications are discussed in Sections 3.4.1 and 3.5.1 respectively.

Overall, in the short- and long-term, there would be minor adverse impacts of HTMW from vegetation removals and controls (mechanical and/or chemical), land disturbing activities, everyday military operations and maintenance for training areas.

3.3.1.5 Alternative 2 (The Preferred Alternative)

All management activities for HTMW as discussed above for the No Action Alternative would continue to be implemented under Alternative 2. All impacts from HTMW identified above for Alternative 1 would be applicable. Potential additional impacts from implementation of Alternative 2 are discussed below.

There would be additional vegetation removals needed to also restore the functionality of the Hartell Bunker OP and its LOS to the K15 targetry. Aerial application of herbicide would be needed to treat an additional 75 acres of pine and hardwood species, resulting in the removal of approximately 530 acres of vegetation overall under this Alternative, as illustrated in Figure 8 This 530 acres of vegetation removals through aerial application of herbicide would restore LOS for the Concord/Ferguson and K36 Ranger Objective Ops, (as identified in Alternative 1), as well as the Hartell Bunker OP LOS. Aerial applications of growth retardant herbicide for Fryar DZ (approximately 1,500 acres) would a still be applicable. This will result in minor, adverse impacts from HTMW.

Within this additional 75 acre area identified for aerial application of herbicide is approximately 3.5 acres that will require UXO surveys and removals to ensure safe access and full functionality of the Hartell Bunker OP. The safest methodology for UXO management is to be detonated and destroyed at the location at which it is discovered, ("blow-in-place"), as part of training exercises for range clearance procedures in accordance with the MMR under RCRA. As such, there would be minor, adverse impacts to HTMW from UXO removals.

Overall, in the short- and long-term, there would be minor adverse impacts of HTMW from vegetation removals and controls (mechanical and/or chemical), land disturbing activities, everyday military operations (including UXO removals), and maintenance for training areas.

3.3.1.6 Mitigation Measures

Adherence to Federal and State laws and Army regulations, and Installation management plans, such as the HWMP and the IPMP, would minimize impacts due construction, training, and maintenance operations activities in the short- and long-term. UXO removals will be conducted in accordance with the Army's Explosive Safety Program, the Military Munitions Rules, and comply with environmental laws and regulations applicable to munitions management and response. Therefore, no additional mitigation measures are warranted.

3.4.1 Biological Resources

Biological resources include native or naturalized plants and animals, and the habitats in which they occur. The dominant plant species make up plant communities, which in turn define the vegetation of an area. Habitat is defined as the area or environment where the resources and conditions are present that cause or allow a plant or animal to live there (Hall *et al.* 1997). Biological resources discussed in this EA include Vegetation (including Invasive Species), Unique Ecological Areas (UEAs), Wildlife, Migratory Birds, Threatened, Endangered, and State Listed Species, and Species of Conservation Concern which could potentially be affected by the activities of the Proposed Action.

3.4.1.1 Affected Environment

The ROI for Biological Resources includes the area within and immediately adjacent to the locations identified in the Proposed Action where construction and maintenance activities are to take place.

Vegetation. Nearly 1,300 species of plants can be found on Fort Benning located within approximately 29,000 acres of non-forested areas and 150,000 acres of woodland. Loblolly and longleaf pine are the predominant conifers within the Installation, comprising approximately 80,000 acres of the woodland; the remaining 70,000 acres of woodland consist of approximately 15,000 acres of forested restricted access areas and 54,000 acres of hardwood forest (Fort Benning 2015a).

Vegetation in areas where the FP footprints are to be expanded consist primarily of upland hardwoods, mixed pine species, and longleaf pine plantation. Many of the FP locations consist of disturbed, open areas that have been encroached with scrub brush, volunteer hardwood species, and various grasses. Vegetation within the K15 impact area consist of pine an scrub oak.

Executive Order 13112 (*Invasive Species*) requires Federal agencies, to the extent practicable and permitted by law, to prevent the introduction of invasive species; to provide for their control; and to minimize the economic, ecological, and human health impacts that invasive species can cause.

Common invasive plant species identified on Fort Benning include the tree species of Chinese tallowtree and mimosa, and shrubs such as Chinese privet and multiflora rose. Invasive vine species include kudzu and English ivy. Invasive grasses include cogongrass and Japanese knotweed. All are extremely aggressive invaders with the capability of forming dense assemblages and/or extensive root systems that displaces native vegetation.

Fort Benning employs an integrated pest management approach to control invasive plant species using targeted, sustainable control methods that can include a variety of measures, such as mechanical and physical controls, and the use of herbicides. Specific procedures related to the control of invasive plant species are outlined in Fort Benning's Integrated Pest Management Plan (Fort Benning 2013). As control of invasive species is not part the Proposed Action, this topic will not be discussed further with the exception of re-occurring, Installation-wide management practices as part of the baseline, (i.e. the "No Action Alternative"), and Cumulative Impacts for current and future, foreseeable projects.

Unique Ecological Areas. In accordance with Department of Defense Instruction 4715.3 (*Natural Resources Conservation Program*), Fort Benning, in conjunction with conservation partners such as The Nature Conservancy (TNC) and the United States Fish and Wildlife Service (USFWS), identified several areas that either have unique or rare ecological characteristics that represent the best example on Fort Benning of a particular habitat or plant community type. These areas were chosen based on characteristics of their soil type, topography, slope, aspect, elevation, hydrology, flora, fauna, and other biotic and abiotic features. Many areas contain remnant native plant communities that have experienced minimal disturbance relative to other similar communities. Of the 19 UEAs identified on Fort Benning, the Proposed Action will only occur within the Hastings Relict Sandhills and the Pine Knot Creek Blackwaters.

The Hastings Relict Sandhills encompasses approximately 2,600 acres in the northeastern portion of the Installation, and consists of modified longleaf pine forests with well-drained sandy soils, that provides habitat to numerous amphibian, reptilian, and avian species of concern (Fort Benning 2015a). Nine animal species of special concern are known to occur within this UEA that include a high density of Gopher Tortoises (and other species that utilize their burrows), RCW habitat, and clay based depression

ponds that are important breeding sites for the state listed (Georgia) dusky gopher frog. The sandy soils of this UEA also provides ideal habitat for Southern Hognose Snake which is a species of concern in the state of Georgia.

The Pine Know Creek Blackwaters UEA encompasses 1,630 acres that transects the east-central portion of Fort Benning that includes Pine Knot and Little Pine Knot Creeks that traverse through the K15 impact area. This area represents the best example of a Coastal Plain stream on the Installation with unique hydrologic characteristics that include relatively constant flow and temperature, high acidity, low sediment load, and low fish diversity. Two fish species of special concern are the broadstripe shiner and the southern brook lamprey. One plant of conservation concern, the bog sneezeweed, also occurs within this UEA. Seasonally flooded and saturated wetlands hardwood forests and longleaf pine are the more dominant vegetation.

Wildlife. Fort Benning contains a wide variety of more than 350 species of wildlife, including approximately 154 species of birds, 47 species of mammals, 48 species of reptiles, 25 species of amphibians, 67 species of fish, and 9 species of mussels, as well as numerous insects and invertebrate species.

The most commonly encountered species found within the Installation include: American alligators, turtles, snakes, wading birds and waterfowl, American beaver, white-tailed deer, feral swine (pigs), eastern wild turkey, eastern gray squirrel, raccoon, rabbits, and other small mammals and songbirds (DA 2009). The Seminole bat, southeastern myotis, and Brazilian free- tailed bat are known to occur at Fort Benning. Reptiles and amphibians found on the Installation include eastern coachwhip, eastern diamondback rattlesnake, Florida pinesnake, southern hognose snake, eastern tiger salamander, and other species of the Longleaf Pine Ecosystem (Fort Benning 2015a).

Fort Benning supports a high diversity of native freshwater fishes, including both game and non-game species. Native non-game fishes include many species of shiners, darters, shad, and minnows, of which two species, the broadstripe shiner and southern brook lamprey discussed above, that may be affected by the Proposed Action. Popular game fish species most often sought by fishermen in Pine Knot Creek include largemouth and white bass, bluegill, redear or shellcracker, black crappie, and channel catfish (Fort Benning 2015a). Common insects in stream systems include larval and adult stages of stoneflies, mayflies, midges, and caddis flies. In addition, a variety of crustaceans, such as crayfish, mussels, isopods, snails, and amphipods, occur within the regional habitat. At least four mussel species of conservation concern occur within Fort Benning, however, none are known to occur within the Proposed Action area and therefore, will not be discussed further in the EA.

Some of the species discussed herein provide major outdoor recreational value in the form of hunting, fishing, and wildlife viewing. Management of these species, which is important to meet user demands, includes ensuring adequate enforcement of hunting and fishing regulations. During training exercises, Fort Benning limits access for hunting and fishing because of safety and security concerns. Implementation of the Proposed Action is not expected to alter any current management requirements or considerations for wildlife species or habitats, and therefore will not be discussed further in this EA, with the exception of re-occurring, Installation-wide management practices as part of the baseline, (i.e. the "No Action Alternative"), and Cumulative Impacts for current and future, foreseeable projects.

Migratory Birds. Approximately 150 species of migratory birds are present (either year-round or seasonally) at Fort Benning. The breeding season for migratory birds is typically spring through summer (DA 2009). Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) and EO 13186 which mandates the conservation of migratory birds by Federal agencies. Section 315 of the 2003

National Defense Authorization Act provided that the Secretary of the Interior prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities. However, an installation is not allowed to take migratory birds indiscriminately during readiness activities in accordance with the *Authorization of Take Incidental to Military Readiness Activities*.

Migratory birds of conservation concern know to occur on Fort Benning include Bachman's Sparrow, Southeastern American Kestrel, Migrant Loggerhead Shrike, and Osprey. Due the transitory and mobile nature of migratory birds, it is possible that these species could be utilizing wetlands, longleaf and other vegetative habitats that could be affected by the Proposed Action.

The MBTA grants the Secretary of the Interior the authority to establish hunting seasons for species for which USFWS has determined that hunting is appropriate; species for which there is a long tradition of hunting; and species for which hunting is consistent with their population status and long-term conservation. Two species of resident game birds at Fort Benning include the northern bobwhite quail and eastern wild turkey. There are 19 other species of migratory game birds (at least 16 of which are waterfowl) at Fort Benning that include (but not limited to) the mourning dove, common snipe, American woodcock, Canada goose, and a wide variety of ducks and teals including mallard, wood duck, ring-necked duck, American black duck, redhead, hooded merganser, and green- and blue-winged teals (USACE 2009).

Bald eagles are no longer listed as threatened, endangered, or proposed by USFWS under the Endangered Species Act (ESA); nevertheless, the species is still protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d) and the MBTA. Two nesting pairs are known to occur on Fort Benning, and are located along the Chattahoochee River and at King's Pond. Both nesting locations will not be affected by implementation of the Proposed Action. Therefore, Bald Eagles will not be discussed further in this EA.

Threatened, Endangered, and Species of Conservation Concern. A total of 96 species (4 amphibians, 8 birds, 7 fishes, 4 mammals, 4 mussels, 9 reptiles, and 60 plants) of conservation concern are found on Fort Benning. This includes plant and animal species listed as threatened, endangered, or rare by USFWS, the state of Georgia, and/or the state of Alabama. The ESA only protects Federally listed species. Army Regulation 200-1, *Environmental Protection and Enhancement*, guides Army compliance with the ESA. Six species with Federal status are known to occur on Fort Benning and are listed in Table 2.

Of the six species with Federal status listed in Table 2, only the RCW and Gopher Tortoise could be potentially impacted by the Proposed Action. Although the Shiny-rayed Pocketbook has a critical habitat designation along Uchee Creek in Russell County, Alabama, there are no known populations located on Fort Benning. Populations of the Georgia Rockcress and Wood Stork are localized to the banks and back waters and wetlands of the Chattahoochee River. Known Relict Trillium populations occur in moist hardwood forests associated with Baker, Kendall, and Randall Creeks in the northern drainages of the Installation. Based on the locality and occurrences of the Shiny-rayed Pocketbook, Georgia Rockcress, Relict Trillium, and Wood Stork, there are no impacts anticipated to these species, and therefore will not be discussed further in this EA.

Red-cockaded Woodpecker (Federal Endangered). 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. The RCW was listed as endangered in 1973 with the passage of the ESA because of its rarity, documented declines in local populations, and reductions in available nesting habitat. RCWs have social structures that involve a breeding pair and helpers that assist with cavity excavation and maintenance, egg

incubation, feeding young, and defending the group's territory. Fort Benning has one of the largest RCW populations in the southeastern United States. The RCWs are well dispersed over the Installation. However, no active clusters exist on the Alabama portion of the Installation or in any of the Cantonment area.

Table 2. Species with Federal Status Known to Occur on Fort Benning

Species	Federal Status	State Status (GA ; AL)	Known to Occur on Fort Benning?
Mussels			
Shiny-rayed Pocketbook *Hamiota subangulata*	E, CH*	E ; SP	No
Plants			
Georgia Rockcress *Arabis georgiana*	T	T ; NA	Yes
Relict Trillium *Trillium reliquum*	E	E ; NA	Yes
Birds			
Wood Stork *Mycteria americana*	T	E ; SP	Yes
Red-cockaded Woodpecker *Picoides borealis*	E	E ; SP	Yes
Reptiles			
Gopher Tortoise *Gopherus polyphemus*	C	T ; SP	Yes

Source: U.S. Army (2015)
Notes: C = Candidate; CH = Critical Habitat; E = Endangered; T = Threatened; N/A = Not Applicable; SP = State Protected
*Critical habitat has been designated for the shiny-rayed pocketbook on Fort Benning along Uchee Creek in Russell County, Alabama (Federal Register, 15 November 2007, 50 CFR Part 17).

Although state-listed species are not protected under the ESA, they may be considered for Federal listing in the future and are afforded special management attention in Fort Benning's INRMP. Four State-listed animal species are present within the boundaries of Fort Benning. The four animal species include the Gopher Tortoise (Threatened), Barbour's Map Turtle (Threatened), Alligator Snapping Turtle (Threatened), and the Bluestripe Shiner (Threatened).

Intensive efforts have been made to enhance management activities since the mid-1990s. It takes 30 years of growth for pine seedlings to mature to a point that they are considered suitable foraging habitat for RCWs; 60+ years before they are considered suitable nesting habitat. The primary limiting factor for the RCW is availability of suitable cavity trees. Encroachment of hardwoods due to the exclusion of fire has also degraded RCW habitat. Specific management actions for the RCW include the restoration of longleaf pine, frequent prescribed burning in habitat, cavity tree and cluster boundary marking, mechanical and herbicide control of nesting and foraging habitat, monitoring to determine population trends, artificial cavity installation, and the translocation of birds. Management activities currently follow the USFWS

2003 RCW Recovery Plan and the 2007 Management Guidelines for the Red-cockaded Woodpecker on Army Installations.

Creating and maintaining good quality foraging habitat is a critical aspect of RCW recovery, especially over the long term, through prescribed burning and removal of hardwood overstory. Prescribed burning events are conducted on approximately 35,000 acres per year on Fort Benning, and are based on a three year rotational schedule. During prescribed burns, "burn units" are identified utilizing natural features such as rivers, creeks, roads, trails, and established firebreaks to designate the boundaries of the area to be burned. Burn units range in size from 200 to 600 acres with an average of 275 acres (Fort Benning 2015a).

Herbicide applications are utilized in forested areas that are dominated with hardwoods and non-longleaf pine species. Mature longleaf pine forests are the preferred RCW habitat but many years of logging and fire suppression have artificially shifted the installation's forest to a loblolly pine forest with a substantial component of 'off-site' hardwood species on sites that were once dominated by longleaf pine. This off-site over-story is being strategically removed from historic longleaf areas which are then replanted with longleaf pine seedlings. The potential herbicide treatment area on Fort Benning consists of approximately 131,000 acres, which is most economically and efficiently treated through aerial application. Historical records regarding aerial herbicide application for RCW habitat improvements indicate that it is not uncommon to treat 1,000+ acres over the course of a year.

Demographic analysis conducted between 2009 and 2013 concluded the minimum number of clusters needed on the landscape to attain a recovery goal of 351 potential breeding groups is 382 clusters. This number is based on the percentage of active potential breeding groups the Installation has relative to the total number of manageable clusters on the landscape. In 2017, 399 managed and eight unmanaged RCW clusters are allocated in foraging habitat partitions.

Gopher Tortoise (Federal Candidate, Georgia Threatened). The gopher tortoise is a is a large, dark-brown to grayish-black terrestrial turtle with elephantine hind feet, shovel-like forefeet, and throat projection on the yellowish, hingeless undershell. West of the Tombigbee River, the gopher tortoise has been listed as threatened in Alabama, Louisiana, and Mississippi since 1987. East of the Tombigbee River, the gopher tortoise is a candidate for Federal listing. The species relies on dry sandy sites to dig burrows and forage on weeds and grasses. Gopher tortoise burrows also provide shelter for a variety of other animal species such as indigo snakes and gopher frogs.

The gopher tortoise is found primarily within the sandhill communities located in the northeastern portion of the Installation. Many factors are limiting the gopher tortoise, but the most significant threat is the loss of habitat due to intensive land use. Current management includes protection of existing suitable and potential habitat while maintaining or increasing the current population on the Installation. This management involves, but is not limited to, conducting habitat surveys, implementing prescribed fire activities, applying silvicultural treatments, and monitoring gopher tortoise activity (Fort Benning 2015a).

Fort Benning is currently divided into five tortoise Habitat Management Units (HMUs), totaling an estimated 20,000 acres of suitable habitat (per. com. Thornton 2017). The most recent population estimate is approximately 2,500 gopher tortoises (Fort Benning 2015). Management activities focus on the protection and enhancement of gopher tortoise habitat with the goal of maintaining the existing populations on Fort Benning. Management activities currently follow the USFWS' 1990 Gopher Tortoise Recovery Plan and are compatible with the 2008 Management Guidelines for the Gopher Tortoise on Army Installations.

3.4.1.2 Environmental Consequences

Impacts to biological resources would be considered significant if one or more of the following would result:

- Substantial loss or degradation of habitat or ecosystem functions (natural features and processes) essential to the persistence of native plant and animal populations;

- Substantial loss or degradation of a sensitive habitat that support high concentrations of state-listed species, a wildlife species, or migratory birds; or

- Disruption of a Federally listed species, its normal behavior patterns, or its habitat that substantially impedes Fort Benning's ability to either to avoid jeopardy or conserve the species.

The definition of "substantial" is dependent on the species and habitats in question and the regional context in which the impact would occur. Impacts may be considered more adverse if the action affects previously undisturbed habitat or if the impact would occur over a large portion of available habitat in the region.

3.4.1.3 No Action Alternative

Biological Resources would continue to be affected at the current level of operational training. Overall, impacts to biological resources would range from no impact to potentially moderate, adverse impacts from training. However, recurrent management practices for natural resources on Fort Benning will minimize these impacts.

Vegetation. There will be long-term beneficial impacts to vegetation from natural resource management practices of prescribed burning activities and application of herbicides for invasive species control, and enhancement of RCW foraging habitat with the restoration of the longleaf pine ecosystem. Vegetation in maneuver training areas will experience impacts from minor, to moderate adverse from operational training exercises, but will be minimized through recurring ITAM maintenance activities that include grading and seeding for soil stabilization by restoring vegetative cover.

Unique Ecological Areas. UEAs will still receive priority for management activities and monitoring efforts as identified in the Installation's INRMP. UEAs will still be monitored for unauthorized disturbances and surveyed for threatened and endangered species. UEAs also receive priority for soil erosion projects, invasive species control, and longleaf pine reforestation. Overall, there will be long-term beneficial impacts to UEAs from natural resource management practices.

Wildlife. Unintentional mortality from training activities could continue to affect fish and wildlife on Fort Benning, but the potential losses through training activities would be minimal (USACE 2009). Fort Benning will continue to manage natural resources to promote the conservation and restoration of wildlife and their habitats in accordance with The Fish and Wildlife Conservation Act of 1980, and the Installation's INRMP. Management activities are focused on promoting ecosystem health that integrates both military mission needs and conservation of natural resources. Overall, there will long-term beneficial impacts to wildlife from natural resource management practices.

Migratory Birds. A Memorandum of Understanding (MOU) between DoD and the USFWS is in place to promote the conservation of migratory bird populations while sustaining the use of military managed lands. Fort Benning manages and conserves migratory bird species in accordance with this MOU through

its INRMP, and considers effects to migratory birds in any proposed action through the NEPA process. Overall, there will long-term beneficial impacts to migratory birds from natural resource management practices.

Threatened, Endangered, and Species of Conservation Concern. In addressing natural resources management in relation to the military mission, Fort Benning proactively manages and protects threatened, endangered, and state listed species through implementation of its INRMP. Management activities are conducted in accordance with a number of Biological Assessments and Opinions, Federal Acts, Executive Orders, USFWS Recovery Plans, and Army, Federal, and State regulations. Overall, there will long-term beneficial impacts from management practices for threatened, endangered, and state listed species.

3.4.1.4 Alternative 1

All management activities for biological resources as discussed above for the No Action Alternative would continue to be implemented under Alternative 1.

Vegetation. The expansion of the existing FPs could incur approximately 315 acres of vegetation removals within the proposed footprints. However, as these FP locations have been used historically for artillery training, they consist of some pre-disturbed areas of various acreages that are not forested or vegetated. Additional impacts to vegetation may occur from improvements to access trails and construction of erosion control features. The extent of vegetation removals will be determined on a case-by-case basis based on proximity and viability of existing access trails, topographic slopes, and avoidance of impacts to environmental resources within the area.

Vegetation removals through aerial herbicide application to restore LOS from the Concord/Ferguson and K36 Ranger Objective OPs to the K15 targetry would potentially incur the loss of an additional 455 acres of pine and hardwood species, as illustrated in Figure 7. Initial effects of herbicide application will result in loss of foliage in the overstory. Restoration of LOS may require more than one aerial application of herbicide dependent upon effectiveness of the herbicide and preferred results. As the overstory is reduced, herbicide will most likely begin to reach mid-story and ground vegetation, causing stress and/or mortality. Over time as the trees die they will drop most their smaller branches and outer bark layers, and lose their tops, subsequently increasing the amount of plant litter on the ground. Mid-story and ground vegetation would also contribute to the amount of plant litter through stress or mortality. Trees may also be "felled" from munitions firing into K15 impact area.

Maintenance activities for FPs and DZ/HLZ/PZs would result in minor, adverse impacts to vegetation. As these training areas are required to support the open field training environment, encroaching vegetation could create safety issues and therefore, most of these areas are to be maintained as open grassy fields, and are not managed to achieve any specific natural resource conservation goals.

Overall, in the short-term, there would be moderate, adverse effects to vegetation from removal activities, and minor, adverse effects in the long-term from maintenance activities.

Unique Ecological Areas. All existing FPs, with the exception of mortar FP 110, are located outside of the UEAs on Fort Benning. The expansion of the existing FPs would only affect 11.12 acres within the Hasting Relict Sandhills UEA, resulting in negligible impacts to vegetation. However, the aerial herbicide application to restore LOS from the Concord/Ferguson and K36 Ranger Objective OPs to the K15 targetry will result in impacts within the Pine Knot Creek Blackwaters UEA.

Under Alternative 1, approximately 216 acres of the Pine Knot Blackwaters UEA occur within the area that could be potentially impacted from aerial herbicide spraying. However, in avoiding the 100-year floodplain and wetland areas within the K15 impact area, direct impacts to vegetation would only be approximately 65 acres within the UEA boundary, as illustrated in Figure 9. Potential indirect impacts in this 216 acre area would be from aerial drift from herbicide spraying, and/or runoff from rain events. The potential for these indirect impacts would be minimized by conducting herbicide applications in accordance with the manufacturer's label that include limits on wind speed, application rates, and timing in relation to rain events.

Overall, in the short-term, there would be moderate, adverse effects to vegetation from removal activities. In the long-term, vegetation will begin to re-establish itself through natural, successional processes, but would be minor, adverse impacts due to alteration of the vegetative pattern to the UEA.

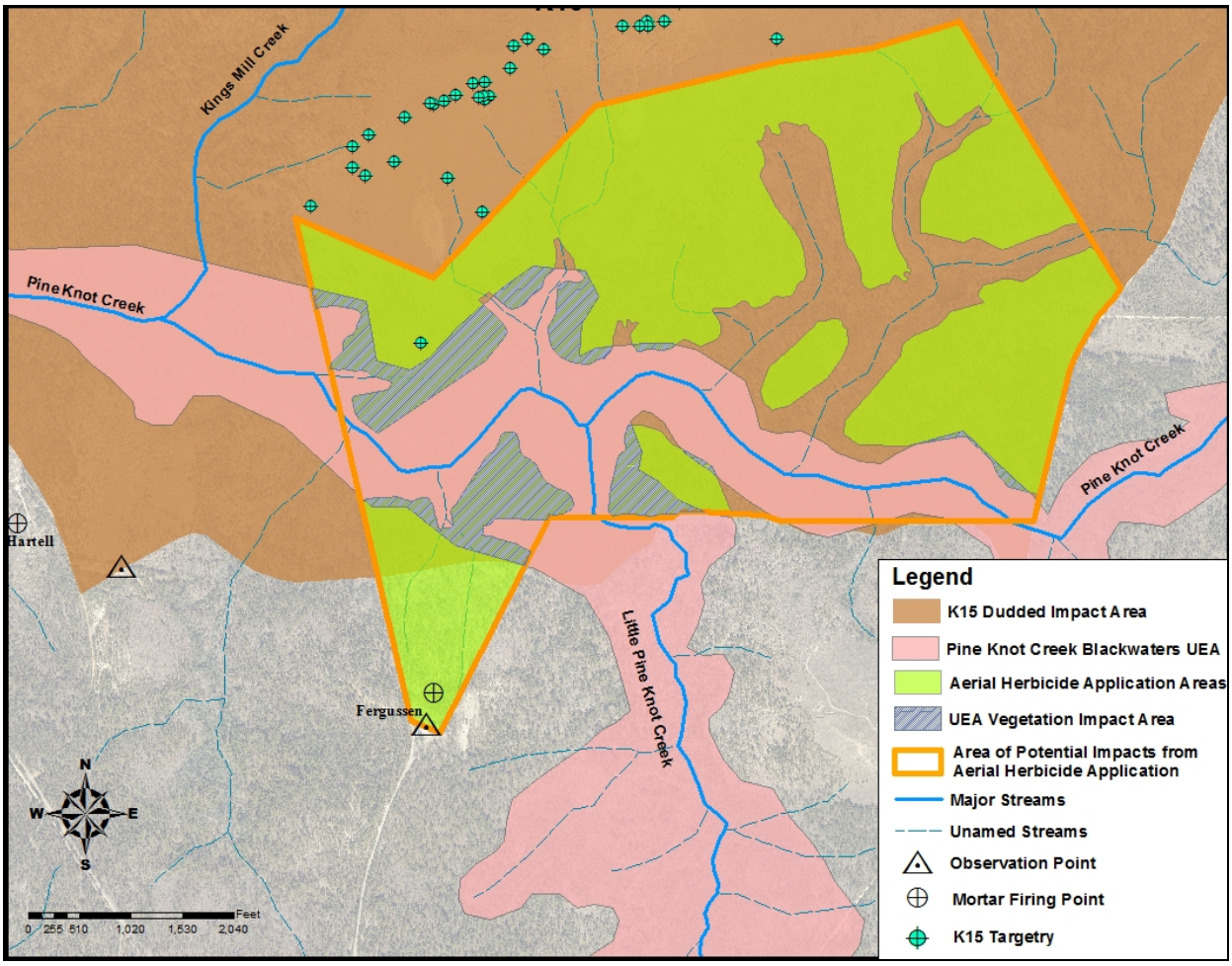
Wildlife and Migratory Birds. Vegetation removals for expansion of FPs and LOS restoration could potentially effect wildlife and migratory birds through habitat loss, degradation, and fragmentation. However, the impacts would be minor as the acreage of lost habitat is small within the breeding ranges of these species. Potential habitat losses would be countered by prescribed burning as it promotes natural regrowth of the herbaceous understory that provides foraging areas for wildlife and migratory bird species. In addition, as there are no direct impacts to or loss of wetlands, wildlife and migratory birds would still have this important habitat resource for foraging, breeding, and nesting (Shaw and Fredine 1956). Overall, there would be short-term, minor adverse effects to migratory bird species. In the long-term, impacts would be negligible.

Threatened, Endangered, and Species of Conservation Concern. Vegetation removals for expansion of FPs and LOS restoration could potentially effect threatened, endangered, and species of conservation concern through habitat loss, degradation, and fragmentation. Potential habitat losses would be countered by prescribed burning as it promotes natural regrowth of the herbaceous understory that provides foraging areas and enhances habitat for many species, especially the RCW and Gopher Tortoise.

Red-cockaded Woodpecker - Approximately 75 acres of pine stands within current foraging partitions would be removed to support the expansion of FPs for artillery and mortar training. An additional 50 acres of pine stands not currently within designated foraging partitions would also be removed. However, none of these pine stand removals would cause any of the current foraging partitions to fall below Fort Benning's Managed Stability Standard [i.e. 3000 ft^2 Basal Area (BA^2) of pines $\geq$ 10 inches diameter at breast height (DBH)], nor cause an incidental take due to loss of pine habitat, or harassment, as all of the proposed FP expansion footprints occur outside of the RCW cavity tree 200-foot buffer.

Aerial surveys in 2009 have documented the presence of at least four RCW clusters within K15, but are not managed, monitored, or counted towards the Installation's recovery goals due to UXO hazards prohibiting personnel from ground access for management activities. The Installation requested and was authorized "incidental take" coverage from UFWS for the 4 RCW groups that were known to exist within the K15 impact area identified from 2009 aerial surveys, as well as for any unknown or future clusters that could form through natural expansion in K15. However, the incidental take coverage authorized in the 2014 ESMC is for explosive munitions fired into these impact areas and/or wildfires caused by munitions, and is not applicable to potential impacts incurred from aerial herbicide applications.

Figure 9. Alternative 1 – Vegetation Impacts in the Pine Knot Creek Blackwaters UEA.



As the previous 2009 K15 RCW survey was outdated, an aerial survey was conducted to verify the presence of these clusters and if any new clusters could be confirmed within the area proposed for herbicide application. Due to funding limitations, an Unmanned Aerial Vehicle (UAV), vice the use of rotary-winged aircraft, was employed in April of 2018 to verify the status of the K15-D cluster within the southeastern corner of the K15 impact area. Unfortunately, the images provided from the UAV did not provide sufficient image resolution to definitively identify RCW cavity trees or activity status of the K15-D cluster.

Fort Benning, through formal consultation with a 2018 update to its RCW ESMC, requested to amend the authorized actions of the incidental take to RCW cluster K15-D to include required maintenance activities necessary to restore LOS to the targetry located in the center of K15 that would maintain military mission capability. Although evidence from the UAV fly-over was inconclusive, RCW cluster K15-D is presumed to be active, and would potentially be negatively impacted due to loss of suitable habitat from the proposed aerial herbicide application.

Restoration of LOS to the K15 targetry from the Concord/Ferguson and K36 Ranger Objective OPs would potentially incur the loss of approximately 272 acres of unmanageable overstory pine stands from aerial herbicide application within the K15 dudded impact area. Not all of this overstory pine is

contiguous, but is considered suitable RCW habitat to support RCW dispersal patterns from east to west within the southern portion of the K15 impact area. Although considered suitable RCW habitat, it cannot be actively managed due to safety hazards associated with UXO. The proposed treatment area will also remove approximately 0.06 acres of suitable habitat for the foraging partition to cluster K-37A, and approximately 1.57 acres (suitable) and 4.3 acres (unsuitable) of habitat for the foraging partition of cluster K36-A (south of the K15 impact area) as illustrated in the RCW ESMC Appendix 18 included in Appendix B of this EA.

The Army and USFWS through formal consultation have determined that the proposed aerial herbicide application is likely to adversely affect RCW cluster K15-D due to loss of habitat. As this RCW cluster was previously covered under and incidental take statement, the amendment to the existing incidental take statement to authorize herbicide application as an allowable action will not change any of the population numbers counted towards the recovery of the Fort Benning RCW population.

These impacts are also minimized by Fort Benning's proactive management activities through its INRMP, RCW ESMC, and the 2007 RCW Management Guidelines. Other pine stands within the K15 impact area will still serve as a dispersal corridor between the northeast corner of Fort Benning and the rest of the RCW population; and RCW clusters within the A20 dudded impact area will still be managed per the conditions of the 2009 Maneuver Center of Excellence Biological Opinion. Potential impacts and/or loss of the clusters in the herbicide application area would not jeopardize the recovery or continued existence of the RCW per the 2018 RCW ESMC Update BO issues by the USFWS.

Gopher Tortoise - The majority of the locations identified tar FP expansions, and areas that may be considered for access trail improvements and erosion control measures, contain Gopher Tortoise burrows, and/or are considered to be part of the HMUs for the Gopher Tortoise. Each proposed site for FP expansion will be surveyed for the presence of Gopher Tortoises prior to vegetation removals and land disturbing activities. If Gopher Tortoise burrows are encountered and found to be inhabited, they will be translocated to other areas within Installation and/or nearby private lands where there is suitable habitat where there are no foreseeable conflicts with training mission activities. Therefore, vegetation removals and land disturbing activities for FP expansions would potentially cause minor, adverse impacts to the Gopher Tortoise population in the short-term.

Although the K15 impact area is not considered part of an HMU, there is suitable habitat within K15 that would support the Gopher Tortoise population. This habitat cannot be actively managed due to the presence of UXO. Initially, aerial application of herbicide for vegetation removals for LOS restoration to the K15 targetry will result in loss of foliage in the overstory. Restoration of LOS may require more than one aerial application of herbicide dependent upon effectiveness of the herbicide and preferred results. As the overstory is reduced, herbicide will most likely begin to reach mid-story, and ground vegetation causing stress and/or mortality to potential foraging habitat of the Gopher Tortoise. Overall, in the short-term, there will be moderate, adverse effects to the Gopher Tortoise due to foraging habitat removals. However, in the long-term, these effects would be countered as vegetation will begin to re-establish itself through natural, successional processes.

Long-term, maintenance activities for FPs after expansion of footprints, and existing DZ/HLZ/PZs would result in negligible impacts to RCW and Gopher Tortoise habitat. These training sites would be considered as previously disturbed, and would not contain any pine stands to managed for RCW habitat. There is the potential for Gopher Tortoises to re-establish burrows within these disturbed areas, but through the Fort Benning NEPA review process, maintenance personnel will be instructed on how to recognize the presence of burrows, measure for avoidance, and contact information of natural resources personnel for removal. Overall, maintenance for encroaching vegetation in FPs, DZs, and HLZ/PZs

would cause minor, adverse impacts in the long-term to RCW and Gopher Tortoise populations.

Species of Conservation Concern - Vegetation removals for expansion of FPs and LOS restoration could potentially effect species of conservation concern through habitat loss, degradation, and fragmentation. Potential habitat losses would be countered by prescribed burning as it promotes natural regrowth of the herbaceous understory that provides foraging areas for wildlife, and enhances the habitat of the dusky gopher frog, bog sneezeweed, and southern hognose snake. Impacts to aquatic species such as Barbour's map turtle, alligator snapping turtle, bluestripe and broadstripe shiners, and the southern brook lamprey, would be negligible as no surface waters would be directly impacted by mechanical and/or chemical vegetation removals for FP expansions, LOS restoration, or open field training area maintenance activities. Indirect impacts to aquatic species could potentially be minor due to aerial drift from herbicide spraying, and/or runoff from rain events. The potential for these indirect impacts would be minimized by conducting herbicide applications in accordance with the manufacturer's label that include limits on wind speed, application rates, and timing in relation to rain events.

Overall, maintenance for encroaching vegetation in FPs, DZs, and HLZ/PZs would cause minor, adverse impacts in the long-term to species of conservation concern.

3.4.1.5 Alternative 2 (The Preferred Alternative)

All management activities for biological resources as discussed above for the No Action Alternative would continue to be implemented under Alternative 2. All impacts to Biological Resources identified above for Alternative 1 would be applicable. Discussion of additional impacts from implementation of Alternative 2 are discussed below.

Vegetation. As with Alternative 1, the expansion of the existing FPs could incur approximately 315 acres of vegetation removals within the proposed footprints for Alternative 2. However, there would be additional vegetation removals to also restore the functionality of the Hartell Bunker OP and its LOS to the K15 targetry. Aerial application of herbicide would be needed on an additional 75 acres of pine and hardwood species, resulting in the removal of approximately 530 acres of vegetation, as illustrated in Figure 8. This 530 acres of vegetation removals through aerial application of herbicide would restore LOS for the Concord/Ferguson and K36 Ranger Objective OPs, (as identified in Alternative 1), as well as the Hartell Bunker OP LOS.

Restoration of the Hartell Bunker OP itself would potentially impact an additional 3.5 acres of vegetation to conduct UXO removals to ensure safe access and functionality of the OP. UXOs within this area will be "blown-in-place", which could damage and/or destroy vegetation at that location or in close proximity.

Overall, in the short-term, there would be moderate, adverse effects to vegetation from removal activities, and minor, adverse effects in the long-term from maintenance activities for encroaching vegetation into FPs and DZ/HLZ/PZs.

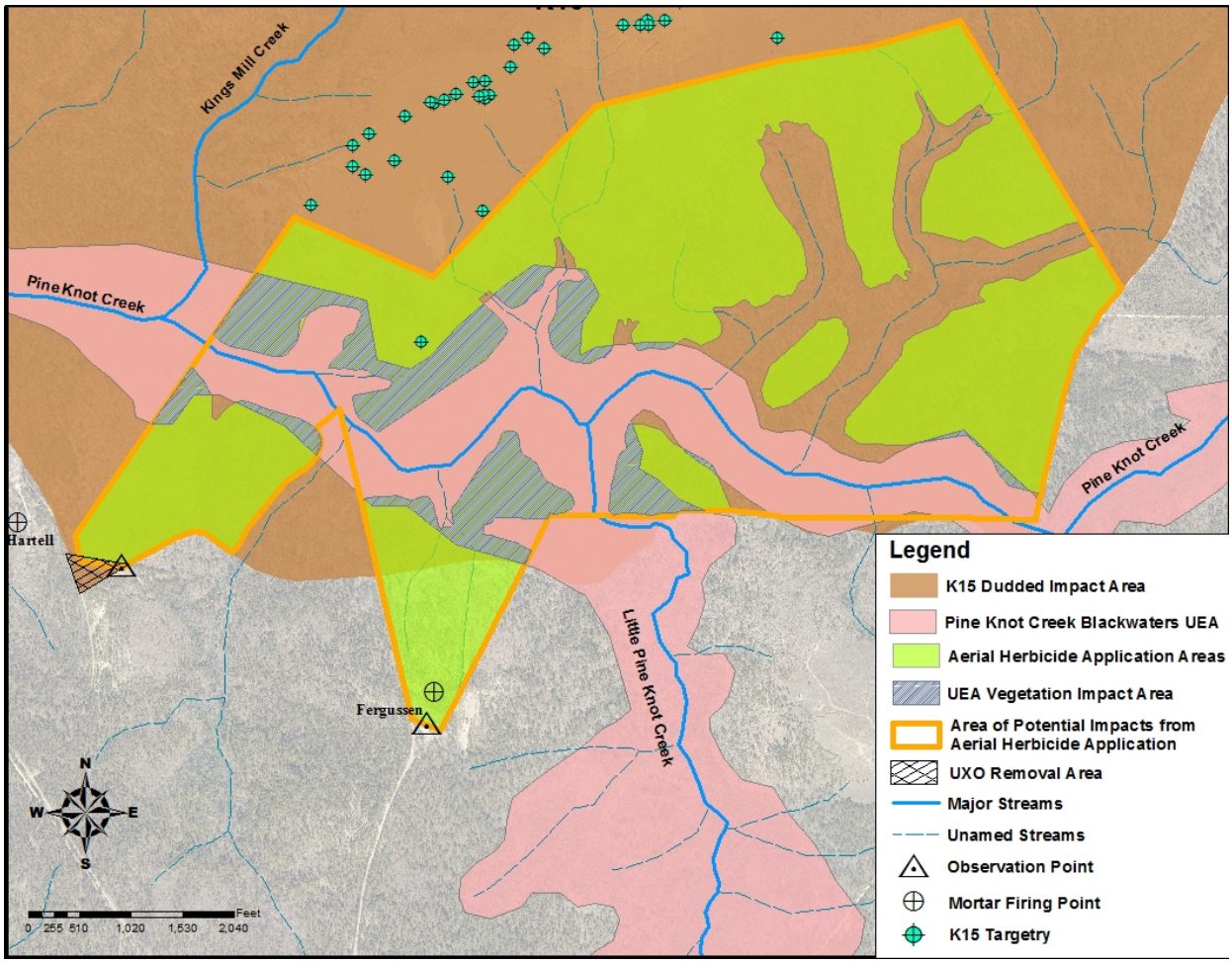
Unique Ecological Areas. As with Alternative1, all existing FPs, with the exception of mortar FP 110, are located outside of the UEAs on Fort Benning. The expansion of the existing FPs would only affect 11.12 acres within the Hasting Relict Sandhills UEA, resulting in negligible impacts to vegetation. However, the aerial herbicide application to restore the LOS from the Hartell Bunker OP to the K15 targetry, will potentially result in additional impacts to the Pine Knot Creek Blackwaters UEA.

Under Alternative 2, approximately 253 acres of the Pine Knot Blackwaters UEA occur within the area that could be potentially impacted from aerial herbicide spraying. However, in avoiding the 100-year

floodplain and wetland areas within the K15 impact area, direct impacts to vegetation would only be approximately 83 acres within the UEA boundary, as illustrated in Figure 10. Potential indirect impacts in this 253 acre area would be from aerial drift from herbicide spraying, and/or runoff from rain events, but would be minimized by conducting herbicide applications in accordance with the manufacturer's label that include limits on wind speed, application rates, and timing in relation to rain events.

Overall, in the short-term, there would be moderate, adverse effects to vegetation from removal activities. In the long-term, vegetation will begin to re-establish itself through natural, successional processes, but would be minor, adverse impacts due to alteration of the vegetative pattern to the UEA.

Figure 10. Alternative 2 – Vegetation Impacts in the Pine Knot Creek Blackwaters UEA.



Wildlife and Migratory Birds. Impacts under Alternative 2 would be consistent with Alternative 1. Overall, there would be short-term, minor adverse effects to migratory bird species. In the long-term, impacts would be negligible.

Threatened, Endangered, and Species of Conservation Concern. Impacts to threatened, endangered, and species of conservation concern under Alternative 2 from expansion of FPs, LOS restoration, and long-term maintenance activities are consistent to the impacts identified under Alternative 1. However, under

Alternative 2, restoration of LOS from the Hartell Bunker OP to the K15 targetry would incur additional impacts to the RCW and Gopher Tortoise.

Red-cockaded Woodpecker - Aerial application of herbicide would be needed on an additional 75 acres of pine and hardwood species, resulting in the removal of approximately 530 acres of vegetation, as illustrated in Figure 8. This 530 acres of vegetation removals through aerial application of herbicide would restore LOS for the Concord/Ferguson and K36 Ranger Objective Ops, (as identified in Alternative 1), as well as the Hartell Bunker OP LOS. Under this Alternative, LOS restoration would incur the loss of 272 acres of unmanageable overstory pine stands as indentified in Alternative 1. Restoration of the Hartell Bunker OP through UXO surveys and removals will not affect any additional RCW pine stands.

Implementation of Alternative 2 would incur similar impacts to RCW cluster K15-D as discussed under Alternative 1, but would alos be minimized by Fort Benning's proactive management activities through its INRMP, RCW ESMC, and the 2007 RCW Management Guidelines.

Gopher Tortoise –Aerial application of herbicide could potentially impact 530 acres of Gopher Tortoise foraging habitat over time. UXO removals to restore the functionality of the Hartell OP could affect approximately an additional 3.5 acres of Gopher Tortoise habitat through vegetation removals and land disturbing activities.

Overall, in the short-term, there will be minor, adverse effects to the Gopher Tortoise due to foraging habitat removals. However, in the long-term, these effects would be countered as vegetation will begin to re-establish itself through natural, successional processes.

3.4.1.6 Mitigation Measures

Fort Benning, through formal consultation with USFWS on the 2018 update to its RCW ESMC, requested to amend the authorized actions of the incidental take to RCW cluster K15-D to include required maintenance activities necessary to restore LOS to the targetry located in the center of K15 that would maintain military mission capability. As such, it was determined that the action of aerial herbicide application within the K15 dudded impact area would adversely affect RCW cluster K15-D and require implementation of "Reasonable and Prudent Measures" (RPMs) and "Terms and Conditions" (T&Cs) as appropriate to minimize the impact of the incidental take incurred by the aerial herbicide application within the K15 dudded impact area. These RPMs and T&Cs per the ESMC BO are:

- **RPM #1. Coordinate with the Service prior to implementing the K15 aerial herbicide treatment**. Although the Installation has accounted for the anticipation of adverse effects to RCWs upon the application of the K15 herbicide treatment, little was documented regarding the details of the chemical proposed for use, concentrations used, etc. Once known, the Installation should confer with the Service prior to implementation.

- **T&C #1. Coordinate with the Service prior to applying herbicides in the K15 Impact Area (RPM #1).** The Installation should develop an herbicide plan that closely a lines with the Standard Operating Procedures used by the US Forest Service. Elements include drift mitigation measures, unit marking strategies, on the ground unit marking (although the Service acknowledges much of the unit is in the K15 Impact Area) pretreatment recon flight, post treatment considerations and tasks, etc. For complete detail on Forest Service protocols, see https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497004.pdf, Appendix N, Aerial Spray Guidelines and Drift Model Results.

The ESMC BO also included "Monitoring and Reporting" (M&R) requirements. In order to monitor the impacts of incidental take, Ft. Benning must report the progress of the Action and its impact on the species to the Service as specified in the incidental take statement (50 CFR §402.14(i)(3)). This M&R per the BO consists of:

- **M&R #1. K15 Herbicide Inspections (RPM #1).** Prior to the K15 herbicide treatment being applied, the Installation should develop a monitor/inspection scheme that will inform the Service and Ft. Benning on the accuracy and effects of the application (e.g., drift/overspray mortality to target species and/or non-targeted species, further treatment required, etc).

The Installation must require any permittee, contractor, or grantee to accomplish the monitoring and reporting through enforceable terms that are added to the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify the Installation and the Service if the amount or extent of incidental take specified in the BO for the RCW ESMC is exceeded during implementation of the aerial herbicide application within the K15 dudded impact area. Reinitiation of consultation with USFWS will be required if the Proposed Action is modified to the extent that exceeds the impacts identified the 2018 RCW ESMC BO.

Adherence to Federal and State laws and Army regulations, as well as the IPMP, INRMP (to include species specific ESMCs), and other Installation management plans, would minimize impacts due vegetation removals for FP expansions, training operations, and maintenance operations activities in the short- and long-term.

3.5.1 Geology and Soils

3.5.1.1 Affected Environment

The majority of Fort Benning is located south of the Fall Line, which is defined by Coastal Plain strata on top of Piedmont rocks. An exception is the northeastern portion of Fort Benning, which is located within the Piedmont province. Along the Fall Line, crystalline rocks of the Piedmont are overlain by marine or fluvial sediments, resulting in varied topography. The sedimentary sequences of the Coastal Plain that overlie the crystalline basement rocks at Fort Benning consist of materials deposited during the Cretaceous, Tertiary, and Quaternary Periods. The Cretaceous Period sediments from the uplands consist of five geologic formations: the Ripley Formation, Cusseta Sand, Blufftown Formation, Eutaw Formation, and the Tuscaloosa Formation (DA 2009). As the Proposed Action will consist primarily of localized grading and maintenance activities for training area development and sustainability, there are would be no adverse effects to geological features or resources across the Installation. Therefore, geologic resources are not further evaluated in this EA.

Two basic soil provinces make up Fort Benning: the Georgia Sand Hills and the Southern Coastal Plains. The Georgia Sand Hills are a narrow belt of deep sandy soils with rolling to hilly topography. These soils are primarily derived from marine sand, loams, and clays that were deposited over acid crystalline and metamorphic rocks. South of the Sand Hills are the Southern Coastal Plains soils, which are divided into nearly level to rolling valleys and gently sloping steep uplands. These soils contain a loamy or sandy surface layer and loamy or clayey soils (DA 2004).

Based on the available soil survey data and considering an individual soils series category for its K factor only, most of Fort Benning's soils are identified as highly erodible. The degree of erodibility is determined by physical factors such as drainage, permeability, texture, structure, and percent slope. The rate of

erodibility is based on the amount of vegetative cover, climate, precipitation, proximity to water bodies, and land use. Soil disturbing activities accelerate the erosion process by exposing soils to precipitation and surface runoff.

Soils classified as Prime Farmland soils are protected under the Farmland Protection Policy Act of 1981. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. As no lands within Fort Benning have been classified as prime farmland, there is no further discussion of this resource in this EA.

The ROI for soils analyses includes Fort Benning and lands adjacent to the Installation that could be directly and/or indirectly affected by soil erosion and sedimentation. Continuous military training in maneuver areas can lead to vegetation damage and/or soil compaction which can lead to an increase in the potential for erosion and sedimentation issues. Additional erosion and sedimentation issues can be attributed to construction related land disturbing activities and rainfall events in conjunction with erodibility characteristics of Fort Benning soils. The establishment and maintenance of appropriate vegetation and proper drainage systems is the primary means of addressing such potential issues.

As the locations of the FPs, DZs, and training area HLZ/PZs are dispersed across almost the entire Installation, there are a number of different of soil types that could potentially be impacted by the activities to implement the Proposed Action. The predominant soil types for FP and HLZ/PZ locations are Troup Loamy Sand, Lakeland Sand, Fuquay Loamy Sand, with minor occurrences of Ailey Loamy Sand, Nankin Sandy Clay Loam, and Cowarts and Ailey Soils. All of these soils types are classified as moderately well to excessively drained soils with moderate erosion hazards.

The larger DZs on the Georgia side of the Installation, Ledo I (South) and Arkman, consist of primarily Troup Loamy Sand and Lakeland Sand which are moderately erodible from erosion processes due to natural weather events. Whereas, Fryar DZ in Alabama is classified as an Udorthents-Urban land complex which can be moderately erodible when subjected to land disturbing activities. The K15 impact area has not been ground surveyed due to UXO safety concerns and associated access restrictions.

3.5.1.2 Environmental Consequences

Impacts to soils are considered significant if ground disturbance or other activities violate applicable Federal or State laws and regulations, and failure to receive applicable state permits (e.g., NPDES construction permit) prior to initiating the Proposed Action. Potential adverse effects to soils could result from vegetation removals and ground disturbance leading to substantial increases on the rate of soil erosion, sedimentation, and the accumulation of pollutants such as hazardous materials and/or waste.

3.5.1.3 No Action Alternative

Under the No Action Alternative, present training operations and training land use would continue in its current state. Direct and indirect effects, such as sedimentation on water resources, would continue due to the movement of military vehicles on unimproved roads and off-road heavy maneuver training. Potential impacts to soils include removal or damage to vegetation, ground disturbances from vehicles and digging activities, as well as the potential for soil compaction in training areas with extensive military vehicle usage. Adverse impacts to soils would continue to be minor to moderate from everyday training events due to the natural erodibility characteristics of Fort Benning soils and rainfall events. These impacts to soils are minimized through maintenance activities implemented through Fort Benning's ITAM program that supports the Army's doctrinal training requirements in accordance with the Sustainable Range Program (SRP).

Herbicide applications for invasive species control and restoration of the longleaf pine ecosystem to support RCW habitat enhancements and population recovery goals would continue as identified by Fort Benning's Natural Resources Management Branch in accordance with the Installation's INRMP and compliance with the ESA. Herbicide applications for RCW habitat enhancements increase could result erosion and sedimentation due to vegetation losses and the natural erosion characteristics of Fort Benning soils and rainfall events. However, vegetation regrowth and successional processes result in long-term, minor impact to soils.

3.5.1.4 Alternative 1

Under this Alternative, short-term, minor adverse effects to soils could occur during construction activities that include exposure, disturbance, and erosion of soils due to vegetation removal. Vegetation removals and grading activities to expand the current FPs for artillery and mortar training could potentially impact approximately a total 315 acres. Additional impacts to soils may occur from improvements to access trails and construction of erosion control features. Improvements to access roads, and the implementation of erosion control features that may require additional land disturbances will be assessed based on proximity and viability of existing access trails, topographic slopes, and avoidance of impacts to environmental resources within the area. Impacts to soils would in general be limited to areas where land disturbing activities would occur, and would depend on several factors including slope, the degree of erodibility of soils, and degree and length of exposure without cover. Short-term impacts due to land disturbing activities are generally expected to be minor due to phasing of the construction and compliance with Georgia National Pollutant Discharge Elimination Standards (NPDES) requirements, including implementation of NPDES BMPs. Stabilization of FPs and access trails, as well as implementation of erosion control features in conjunction with ITAM's long-term maintenance activities, would reduce overland flows from storm events and thereby reduce the potential for sedimentation of water resources.

Aerial herbicide application has the potential cause impacts to soils within the K15 impact area. Over time as pine and hardwood tree species die they will drop most their smaller branches and outer bark layers, and lose their tops. Subsequently, dead trees are more susceptible to being "felled" from natural weather events that will directly disturb and dislodge the soils affixed with their root systems. Trees may also be felled from munitions firing into the K15 impact area and/or wildfires caused by munitions firing.

Restoration of LOS may require more than one aerial application of herbicide dependent upon effectiveness of the herbicide and preferred results. As the overstory is reduced, herbicide will most likely begin to reach mid-story and ground vegetation, causing stress and/or mortality, increasing the amount of plant litter and materials and the ground. Some studies have shown that increased plant litter can be effective in countering erosion by absorbing the kinetic energy of raindrops and slowing runoff rates (Walsh and Voigt 1977). Vegetation mortality due to herbicide applications could potentially result in an increase of soil erosion and sedimentation of nearby water resources. However, in conjunction with the increase of plant litter, and natural successional and re-growth patterns of vegetative cover, the impacts to soils would be short-term and minor.

Maintenance activities for Airborne DZs and maneuver training area HLZ/PZs would have the potential short-term, minor adverse impacts to soils due to training and/or erosion repairs that would require grading and stabilization, as well as bush-hogging or rotary mulching, and disking to ensure Soldier safety and accessibility. These activities would occur over approximately a total of 1,200 acres, and are estimated to be implemented twice a year, dependent upon vegetation growth rates and the degree and extent repairs needed following training exercises. While these maintenance and repair activities could

cause sedimentation issues, potential impacts would be minor in the short- and long-term with the implementation of GA NPDES and Alabama's Construction Best Management Practices Plan (CBMPP) BMPs.

3.5.1.5 Alternative 2 (The Preferred Alternative)

Under Alternative 2, all of the potential impacts identified for FPs expansion, access road and erosion control improvements, K15 targetry LOS restoration, and maintenance activities for DZ/LZ/PZs and FPs as discussed under Alternative 1 are applicable.

Under this Alternative, the Hartell OP Bunker would be re-established to support indirect fire training. The re-establishment of LOS for the Hartell OP would require the removal of approximately 75 acres of vegetation by aerial application of herbicide. At the time of this analysis, actual amounts of applied herbicides cannot be determined based on the variety of Army approved herbicides that have specific mixing and application rates. This would result in potential short-term, minor adverse effect to soils as there would be additional quantities of herbicide to be applied as compared to Alternative 1.

Within this additional 100 acre area identified for aerial application of herbicide is approximately 3.5 acres that would require UXO removals to ensure safe access and full functionality of the Hartell Bunker OP. However, the area identified for UXO removals, is approximately 650-feet away from the nearest surface water tributary to the west, and there are no wetlands per the NWI identified within the area. Therefore, indirect impacts from soils erosion and sedimentation to water resources are expected to be minimal as a result of UXO removals.

3.5.1.6 Mitigation Measures

Implementation of control measures specified in the CWA Section 404 and NPDES construction permits would reduce or minimize any impacts in water resources and protect waterways from sedimentation due to eroding soil conditions. Monitoring and control measures would be implemented to stabilize runoff and minimize soil movement and sedimentation through the use of BMPs during land disturbing activities. Monitoring and control measures in conjunction with the efforts of the ITAM program for land repairs, rehabilitation, and restoration would minimize the impacts to soils from training exercises.

Adherence to Federal and State laws and Army Regulations, as well as Installation management plans, would minimize impacts due construction, training, and maintenance operations activities in the short- and long-term. These laws and regulations include but are not limited to: RCRA, the CWA, Spill Prevention, Control, and Countermeasure (SPCC) and NPDES requirements. Fort Benning plans include but are not limited to: Installation Spill Contingency Plan (ISCP), Hazardous Waste Management Plan, IPMP, and INRMP. Therefore, no additional mitigation measures are warranted.

3.6.1 Water Resources

3.6.1.1 Affected Environment

Water resources discussed in this EA include surface waters and wetlands, floodplains, and groundwater which could potentially be affected by construction and/or maintenance activities associated with the Proposed Action. Also included within the discussion of surface waters is a discussion of water quality, wetlands, and stormwater due to runoff affects to surface water quality and flow. For the purposes of this EA, no wetlands were delineated in the field specifically for any of the Action Alternatives. All water

resources information was obtained through Fort Benning environmental documentation, Installation GIS data, USFWS National Wetlands Inventory (NWI) mapping, and the Federal Emergency Management Agency (FEMA).

Surface Waters. Fort Benning is located within the Chattahoochee River Watershed. This 8,770 square mile watershed contains part of the Blue Ridge, Piedmont, and Coastal Plain Physiographic Provinces and spans portions of Georgia, Alabama, and Florida. Fort Benning contains many tributaries and streams that flow into the Chattahoochee River through Upatoi Creek on the Georgia side of the Installation and Uchee Creek on the Alabama side. Within the southernmost portion of the Installation, streams and tributaries flow directly into the Chattahoochee River, while the northwest portion of the Installation drains into Bull Creek. A small portion of the southeastern corner of the Installation drains into the Flint River Basin to the east. As the Chattahoochee and Flint Rivers traverse southward from the Installation, ultimately join and flow into the Gulf of Mexico (DA 2004).

Fort Benning's water resources management practices include the development and implementation of a soil conservation program at the watershed level. Watershed Management Units (WMUs) were identified at Fort Benning as part of a watershed inventory in 1998. These WMUs are used as a framework for monitoring water quality, erosion, and conducting other water resource management activities. Based on data from the 1998 inventory, Fort Benning contains 29 WMUs, of which 15 occur entirely within the Installation, and are covered in more detail in Fort Benning's Watershed Protection Master Plan (DA 2009). A list of the WMUs where the FP expansions and DZ/LZ/PZ maintenance activities are to occur are included in Table 3. Aerial application of herbicide within the K15 dudded impact area will occur primarily in the Pine Knot WMU, with a very small portion of the Little Pine WMU to be affected.

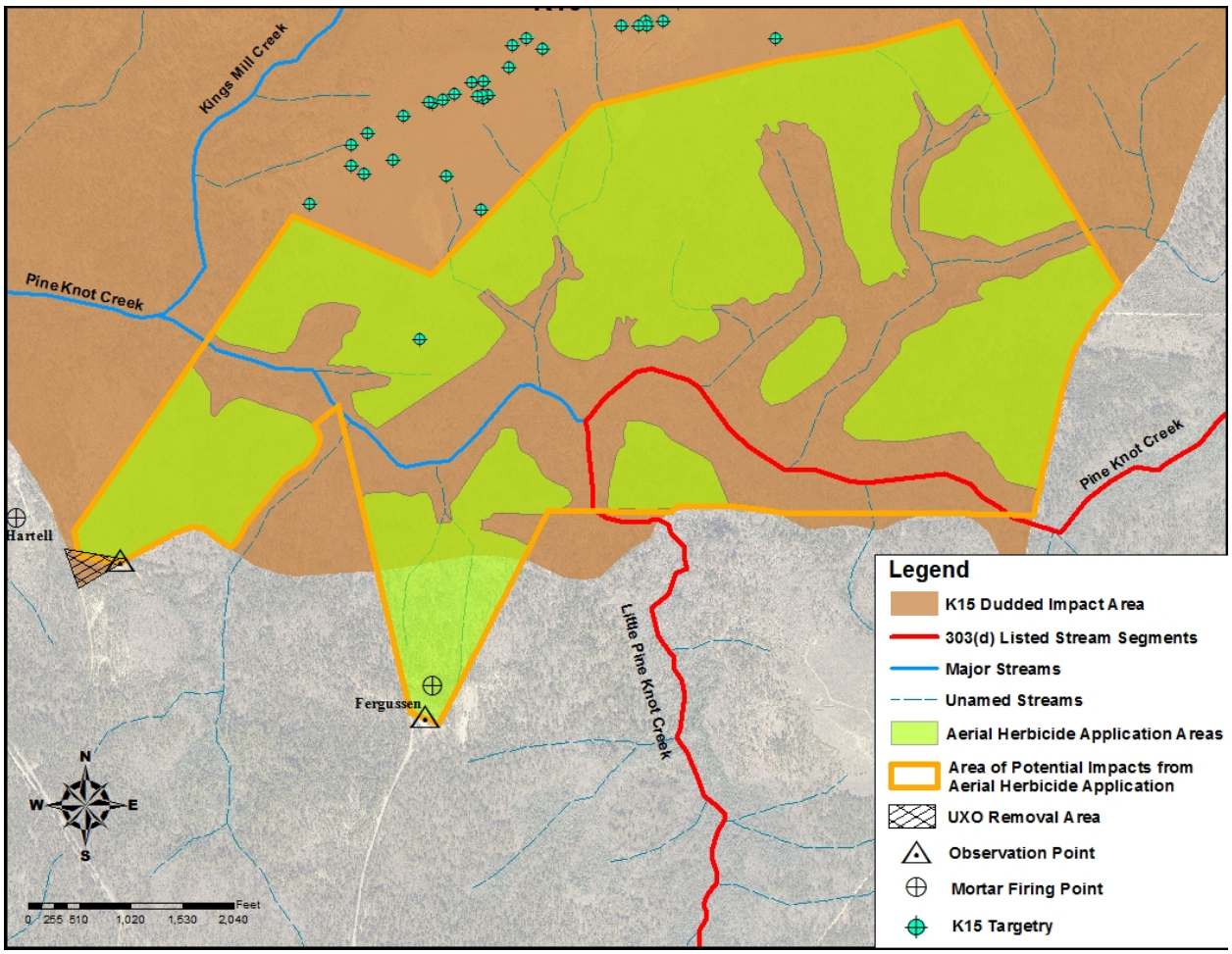
Section 305(b) of the CWA requires States to assess and describe the quality of its waters every two years in a report called the 305(b) report. Section 303(d) of the CWA requires States to submit to the USEPA a list of all of the waters that are not meeting their designated uses and that need to have a Total Maximum Daily Load (TMDL) established for the water body. Two TMDL listed streams occur within the project areas for the Proposed Action. Pine Knot and Little Pine Knot Creeks headwaters originate off-Post and traverse from east to west, and south to north (respectively) into the K15 dudded impact area. As illustrated in Figure 11, these streams converge within K15 and continue flowing westward towards Upatoi Creek. No other 303(d) listed streams on Fort Benning would be directly affected by vegetation removal or land disturbing activities for FP expansions, aerial herbicide applications, and/or maintenance activities as part of the Proposed Action.

Stormwater on the Installation drains via culverts, ditches, swales, and natural seepage and overland flow. Many of the soils at Fort Benning are characterized as susceptible to erosion, and many of the water quality issues for the streams in and around Fort Benning are related to high levels of sedimentation, particularly after storm events.

Wetlands. Wetlands constitute approximately 16,930 acres of the Installation's 182,000 acres (Fort Benning 2015a). Wetlands are generally defined as transitional between aquatic and terrestrial environments and are areas where the "frequent and prolonged presence of water at or near the soil surface drives the natural system," including the soils that form, the plants that grow, and the fish and wildlife communities that use these areas (USEPA 2015). Jurisdictional wetlands, which the USACE regulates, are defined under the Clean Water Act (CWA) as areas that are: "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (USEPA 2015). Wetlands are

protected under Sections 401 and 404 of the CWA and other regulations. Disturbances to wetlands that cannot be avoided need to comply with the permitting requirements of Section 404 of the CWA.

Figure 11. 303d Streams within Proposed Area for Aerial Herbicide Application in K15



Floodplains. EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur in a floodplain and instructs Federal agencies to consider the risk, danger, and potential impacts of locating projects within floodplains. If the agency proposes an action in a floodplain, the agency must consider alternatives to avoid adverse effects and incompatible development in the floodplain. Floodplains typically are described as areas likely to be inundated by a particular flood.

For example, a flood that has a 1 percent chance of occurring in any 1 year is the 100-year flood. The 100-year floodplain includes those lands that are flooded by small and often dry watercourses. Floodplains are associated with many on-Post streams and tributaries and are present throughout the Installation.

Groundwater. Fort Benning is located within the Coastal Plain Hydrogeologic province. The principal groundwater source for Fort Benning is the Cretaceous aquifer system. The regional direction of groundwater flow in the Coastal Plain is from the north to south. Aquifers in the Coastal Plain consist of porous sands and carbonates, and include alternating units of sand, clay, sandstone, dolomite, and limestone (DA 2009). Groundwater depths at the Installation are variable and range from two feet near

Upatoi Creek to more than 100 feet in surrounding elevations. On average, depths in the main cantonment areas vary from 20 to 40 feet. As the primary recharge area for the Cretaceous aquifer system is within the Sand Hill Cantonment Area (west and north of the Proposed Action projects areas), vegetation removal or land disturbing activities for FP expansions, aerial herbicide applications, and/or maintenance activities will have no impacts to groundwater. Therefore, this resource will not be discussed further in this EA.

The ROI for water resources includes the WMUs and associated stream drainage basins where the activities of the Proposed Action would occur as listed in Table 3 and discussed above.

3.6.1.2 Environmental Consequences

Impacts to water resources would be considered significant if they degrade surface quality in a manner that would violate existing water quality standards or other regulatory requirements related protecting and managing water resources. Significant impacts also would include the failure to obtain necessary permits for the loss or destruction of jurisdictional wetlands. Adverse effects to water resources (including water quality) could result from erosion, runoff, and surface contamination from pollutants such as hazardous materials and/or waste. Impacts to water are most likely to occur during rain events on active construction sites, and disturbed soils from training events.

Table 3. Watershed Management Units Affected by the Proposed Action

Watershed Management Unit	Firing Points	Airborne Drop Zones^^ Helicopter Landing/Pick-up Zones*
Bonham	Artillery FP 331 Artillery FP 332	NA
Halloca	Artillery FP 401 Artillery FP 402 Artillery FP 600	Baughman
Hitchitee	NA	Arkman^^ Green Liberty
Hollis	Artillery FP 505 Artillery FP 506 Artillery FP 606	Cyclone Hollis Morgan Mosby Orion Purdy
Lower Oswichee	NA	Anzio II Dickman Field Todd
Little Pine Knot	Artillery FP 210 Artillery FP 212	NA
Pine Knot & Upper Upatoi	NA	Eelbeck
Middle Upatoi	NA	Cemetery Combs Rockwell Hill

Northeast Upatoi	NA	Mobley
Pine Knot	Mortar FP Concord/Fergusson Mortar FP Hartell Mortar FP 4 Mortar FP 110 Mortar FP 203 Mortar FP 206 Mortar FP 207	NA
Sally Branch	Artillery FP 333 Artillery FP 602 Artillery FP 603	NA
Northeast Chattahoochee	NA	NA
Southwest Chattahoochee	NA	Fryar^^
Lower Ochillee	NA	Babbitt McKenna MOUT I & II
Upper Ochillee	Artillery FP 501 Artillery FP 503	Anzio I Lafayette Ledo I South^^ Ledo II North
Upper Randall	NA	Ruth

**Expansion of FPs and future maintenance activities are identified in Table 1. DZ/LZ/PZ maintenance activities will consist of grading and levelling ruts, rills, and uneven terrain. Filling ruts, rills, and gullies with stone and/or dirt as needed to maintain flat, stable surfaces. Remove encroaching vegetation by hand clearing, bush-hogging, or rotary mulching. Grasses over 1.5 feet will be mowed for Soldier and helicopters safety. Growth retardant herbicide will be applied to Fryar DZ to facilitate mowing schedules. Frequency of maintenance activities will be dependent upon impacts from training, natural erosion processes from rain events, and vegetation growth rates.*

3.6.1.3 No Action Alternative

Vehicle movement and other training activities across the Installation would continue to affect water resources. As the majority of Fort Benning soils have been classified as moderately to highly erodible, indirect effects, such as sedimentation, on water resources would continue due to disturbances caused by the movement of military vehicles on unimproved roads and off-road, heavy maneuver training, as well as natural erosion from heavy rainfall events and surface runoff that can transport loose soil particles into waterways and wetlands.

There would be a potential for minor adverse impacts to water resources from the application of herbicides for the restorations of the longleaf pine ecosystem to support RCW habitat enhancements, and for the control of invasive species. Aerial herbicide applications for RCW habitat management is approximately 2,100 acres annually, whereas acreages for herbicide application to control invasive species are more variable (Fort Benning 2015a). The types and quantities of herbicide used are dependent upon the target species to eradicate, and the application rates as prescribed by the manufacturer's label, EPA guidance, and Fort Benning's IPMP. For application sites in close proximity to water resources, only chemicals approved for use in and around water will be used to minimize the potential for contamination of water resources.

Overall, adverse impacts to water resources would continue to be minor to moderate from everyday training exercises and the erosive properties of Fort Benning soils.

3.6.1.4 Alternative 1

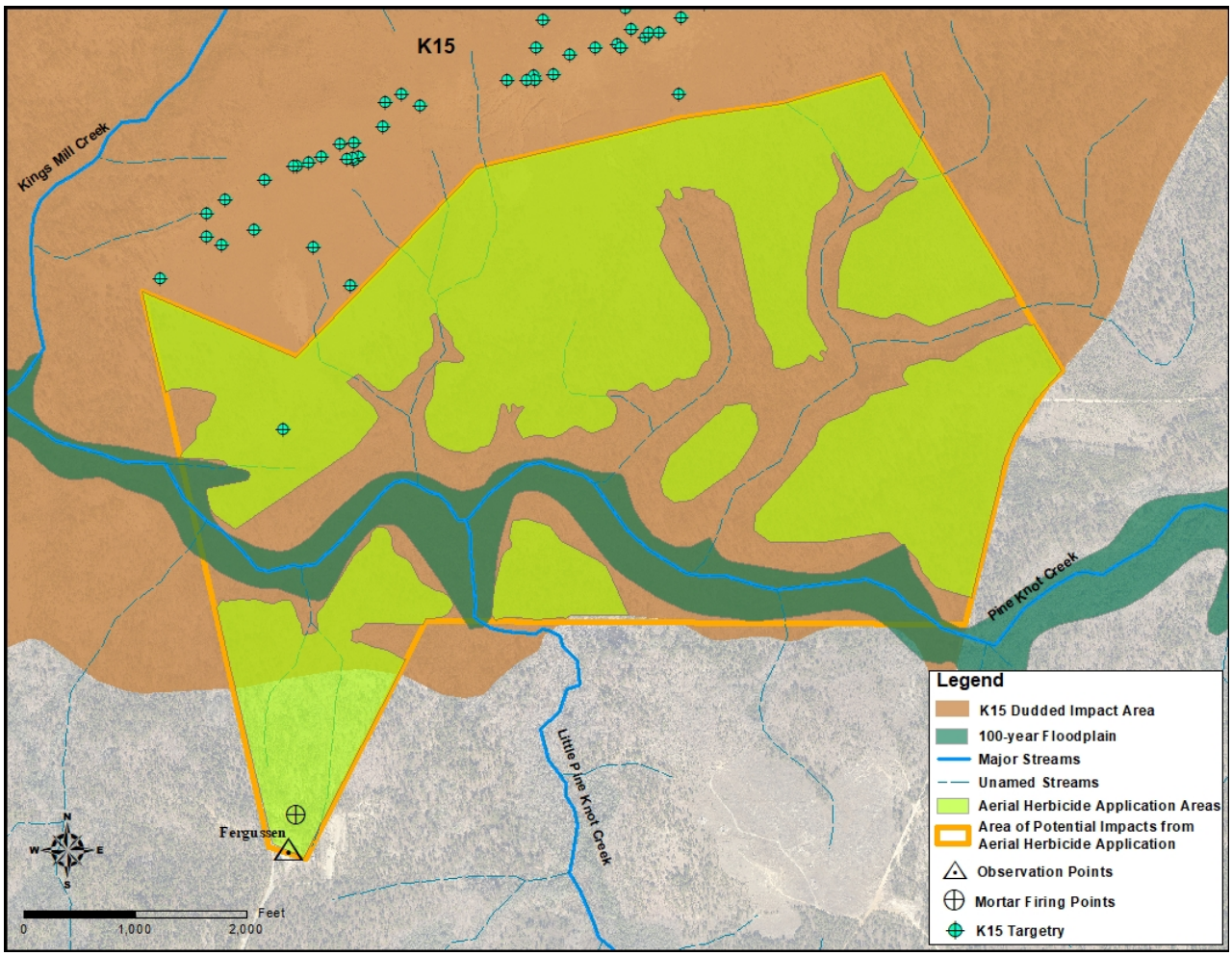
Impact analysis presented in this section is based on current Fort Benning Installation plans and GIS databases for environmental resources. Field verification of state waters (surface waters and wetlands) would be required during the design phase of all proposed construction activities associated with the Proposed Action. Per Fort Benning installation plans and available GIS data, no FP expansion activities will occur within the designated 100-year floodplain for any stream within the affected environment. Additionally, the 100-year floodplain will not be affected by maintenance activities for the FPs (once constructed) and DZ/HLZ/PZs as they are located outside of this zone. The application of herbicide to restore LOS to the K15 impact area will not occur within the 100-year floodplain per FEMA GIS data as illustrated in Figure 12.

Indirect effects could occur due to the potential for sedimentation from vegetation losses, but as the area identified for herbicide application is located within a dudded impact area, there will be no effects to people or property per EO 11988.

Under this Alternative, short-term, minor adverse effects to water resources could occur during construction activities. Vegetation removals and grading activities to expand the current FPs for artillery and mortar training could potentially impact approximately a total of 3,500 linear feet of streams within six of the 22 proposed FP footprint expansions. All of the streams potentially impacted are unnamed, intermittent tributaries of larger stream networks. The NWI database indicates that no wetlands will be directly affected by construction and/or maintenance activities. However, field verification will be required prior to making a jurisdictional wetland determination prior to FP expansions. If wetlands are identified within the project areas, then appropriate permitting from the United State Corps of Engineers will be obtained in accordance with Section 404 of the CWA. Impacts may require the purchase of compensatory wetland and stream mitigation credits from a local mitigation bank.

Additional minor adverse impacts may occur from improvements to access trails and construction of erosion control features. Improvements to access roads and the implementation of erosion control features that may require additional land disturbances will be determined on a case-by-case basis based on proximity and viability of existing access trails, topographic slopes, and avoidance of impacts to environmental resources within the area. Monitoring and control measures in conjunction with the efforts of the ITAM program for land repairs, rehabilitation, and restoration would minimize the impacts to soils from training exercises.

Figure 12. Alternative 1 – 100-year Floodplain within Proposed Area for Aerial Herbicide Application in the K15 Dudded Impact Area



There are two streams within the ROI that are listed on the 303(d) list as not meeting their designated use. Little Pine Knot which flows from the south to the north into the K15 impact area and into Pine Knot Creek, which flows from the eastern boundary of Fort Benning towards and into the K15 impact area as well. Both streams have a designated use of fishing, and are considered to be biota impacted. The closest FP expansion footprint to Little Pine Knot is over 0.3 mile away, whereas artillery FP 203 is approximately 170-feet away from Pine Knot Creek. It is not anticipated that any construction or long-term maintenance activities would have any impacts to these streams, however, the application of herbicide for timber removals to restore the LOS to the K15 targetry from the Concord/Fergusson and K36 Ranger Objective OPs may have the potential for adverse effects to these water resources as well as wetlands within the area.

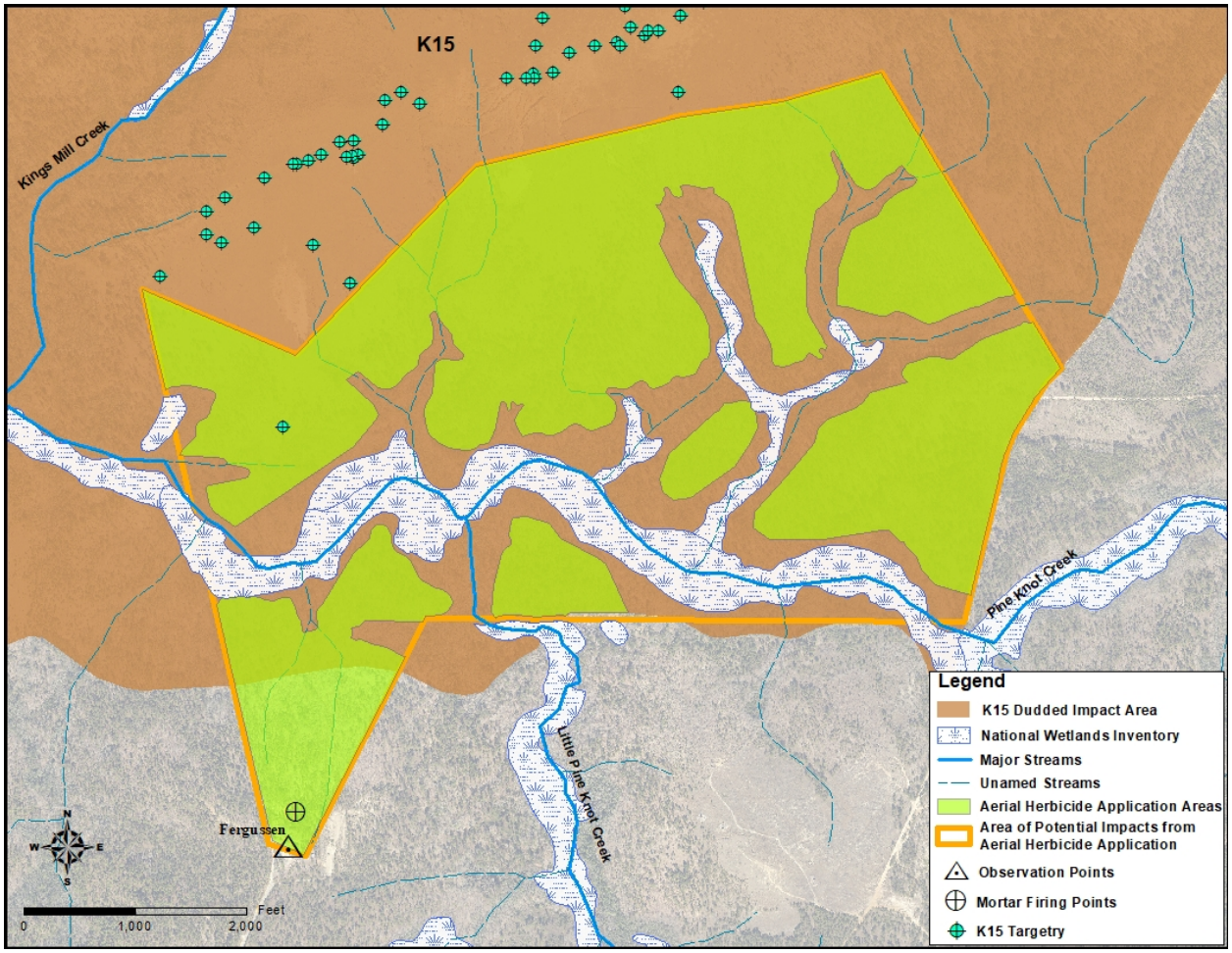
Aerial herbicide application has the potential cause short-term, minor adverse impacts to water resources with the K15 impact area, and downstream drainages. As mentioned above, there are two streams considered as impaired per the 303(d) list. Aerial application of herbicide could potentially affect 1,600 linear feet of Little Pine Knot Creek and 8,500 linear feet of Pine Knot Creek, as well as a number of unnamed tributary surface waters feeding these stream drainages. There are also approximately 105 acres of wetlands (per NWI data) within the drainage area proposed for aerial herbicide application as

illustrated in Figure 13. Potential impacts locally and downstream from these drainages could result from rainfall events after herbicide applications, or aerial drift. However, these impacts would be minimized by applying herbicide during periods of dry weather and low wind speeds.

Vegetation mortality due to herbicide applications could potentially result in an increase of soil erosion and sedimentation of nearby water resources. Dead trees are more susceptible to being felled from natural weather events that will directly disturb and dislodge the soils affixed with their root systems. Trees may also be felled from munitions firing into the K15 impact area and/or wildfires caused by munitions firing. However, it is anticipated that potential sedimentation impacts to water resources would be minor.

Maintenance activities for Airborne DZs and maneuver training area HLZ/PZs would have the potential for short-term, minor adverse impacts to water resources due to training and/or erosion repairs that would require grading and stabilization, as well as bush-hogging or rotary mulching, and disking to ensure Soldier safety and accessibility. These activities would occur over approximately a total of 1,200 acres, and are estimated to be implemented twice a year, dependent upon the degree and extent repairs needed and vegetation growth rates. Potential impacts to water resources would be minimized by implementing BMPs to repair and control erosion issues.

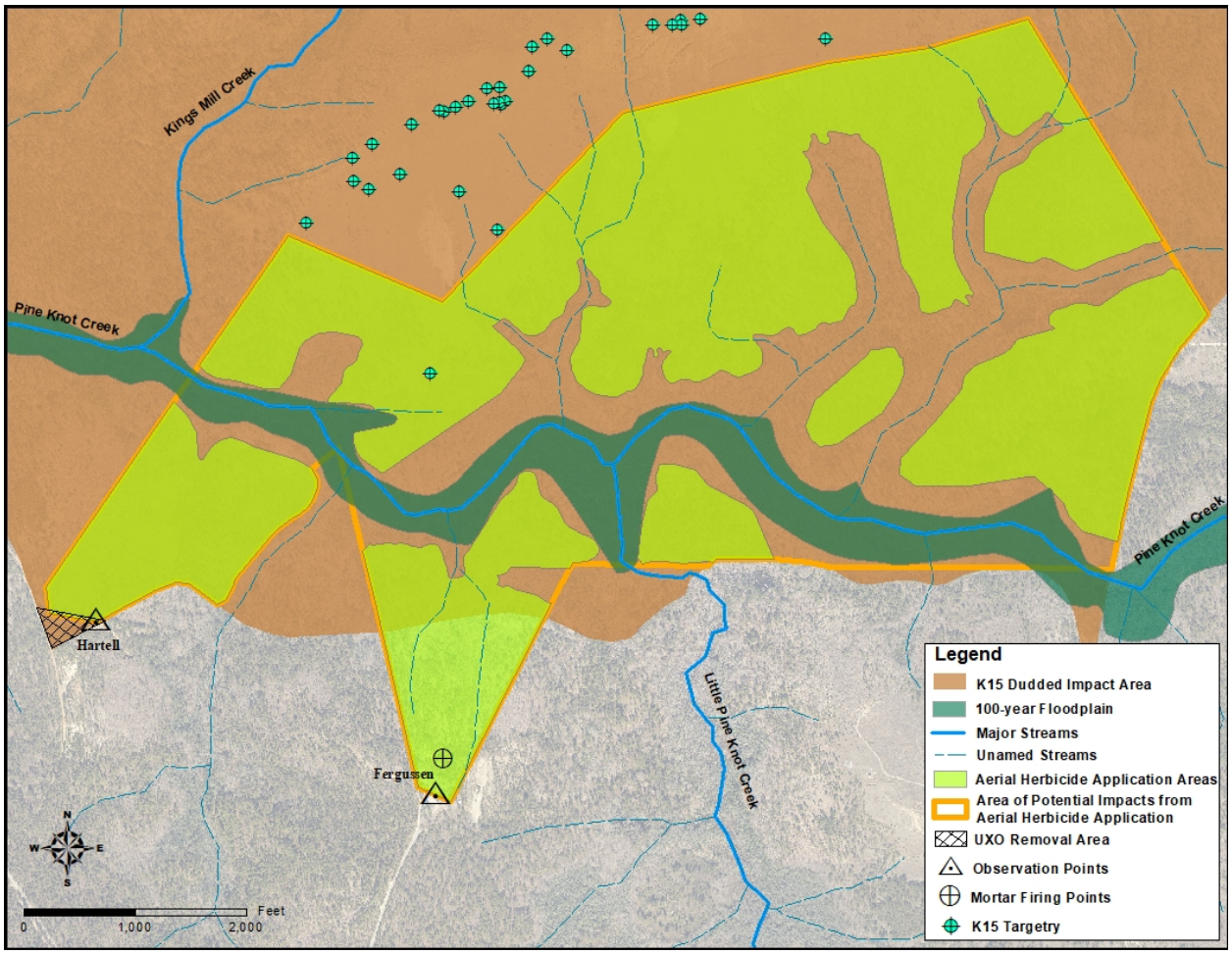
Figure 13. Alternative 1 – Wetlands within Proposed Area for Aerial Herbicide Application in the K15 Dudded Impact Area.



3.6.1.5 Alternative 2 (The Preferred Alternative)

Under Alternative 2, all of the potential impacts identified for FPs expansion, access road and erosion control improvements, K15 targetry LOS restoration, and maintenance activities for Airborne DZs and maneuver training area HLZ/PZs and FPs as discussed under Alternative 1 are applicable. The application of herbicide to restore LOS to the K15 impact area will not occur within the 100-year floodplain per FEMA GIS data as illustrated in Figure 14.

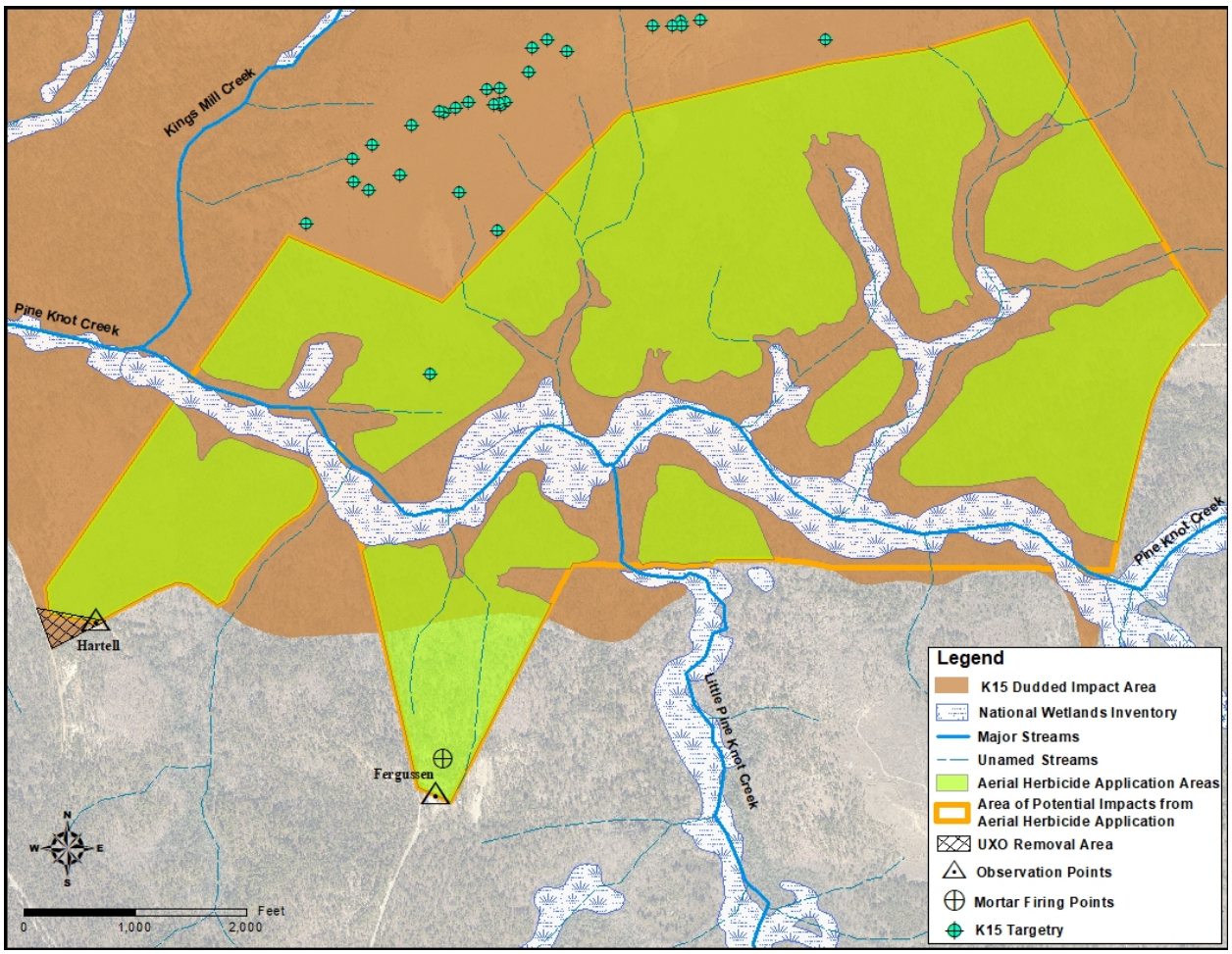
Figure 14. Alternative 2 – 100-year Floodplain within Proposed Area for Aerial Herbicide Application in the K15 Dudded Impact Area.



Under this Alternative, the Hartell OP Bunker would be re-established LOS to support indirect fire training which would include aerial herbicide application on approximately 75 additional acres within the K15 dudded impact area. This area also contains part of the drainage basin for Pine Knot Creek, however, this segment of the stream is not listed on the 303(d) list for impairment status. Approximately 1,600 linear feet of Pine Knot Creek (in addition to the 8.500 linear feet identified in Alternative 1), and 11 acres of wetlands (in addition to the 105 acres identified in Alternative 1), could be potentially be impacted by aerial application of herbicides as illustrated in Figure 15. There would be short-term, minor adverse impacts affects to water resources locally and potentially downstream from these drainages from rainfall events after herbicide applications, or aerial drift. However, these impacts would be minimized by

applying herbicide during periods of dry weather and low wind speeds.

Figure 15. Alternative 2 – Wetlands within Proposed Area for Aerial Herbicide Application in the K15 Dudded Impact Area



Within this 75 acres of additional vegetation removals is an approximately 3.5 acre area that will require UXO removal to ensure the safe access and full functionality of the Hartell Bunker OP. Soils disturbances from UXO removals could potentially cause an increase of sedimentation, but as the area identified for UXO removal is approximately 650 feet away from the nearest surface water feature, the impacts to water resources due to UXO removal are expected to be negligible. Overall, impacts to water resources would be short-term and minor.

3.6.1.6 Mitigation Measures

Implementation of control measures specified in the CWA Section 404 and NPDES construction permits would reduce or minimize any impacts in water resources and protect waterways from sedimentation due to eroding soil conditions. Monitoring and control measures would be implemented to stabilize runoff and minimize soil movement and sedimentation through the use of BMPs during land disturbing activities. Monitoring and control measures in conjunction with the efforts of the ITAM program for land repairs, rehabilitation, and restoration would minimize the impacts to soils from training exercises.

Adherence to Federal and State laws and Army Regulations, as well as Installation management plans, would minimize impacts due construction, training, and maintenance operations activities in the short- and long-term. These laws and regulations include but are not limited to: RCRA, the CWA, Spill Prevention, Control, and Countermeasure (SPCC) and NPDES requirements. Fort Benning plans include but are not limited to: Installation Spill Contingency Plan (ISCP), Hazardous Waste Management Plan, IPMP, and INRMP. Therefore, no additional mitigation measures are warranted.

3.7 Environmental Impacts Summary

The impacts to the VECs carried forward for analysis are summarized in Table 4.

Table 4. Environmental Impact Summary

VEC	No Action Alternative	Alternative 1	Alternative 2 (The Preferred Alternative)
Air Quality	Existing emissions levels are expected to continue from vehicle emissions (personnel and military); prescribed burning activities, and aerial application of herbicide for invasive vegetation controls and RCW habitat enhancements would continue to have a minor impact on air quality.	Short- and long-term, minor, adverse impacts to air quality from emissions and fugitive dust from construction and maintenance activities. Short-term, minor adverse impacts from application of aerial herbicide.	Same as Alternative 1. Potential for additional short-term, minor adverse impacts due to release of hazardous air pollutants from in-place detonation of UXOs. Impacts would be localized and not anticipated to violate air quality standards.
Hazardous & Toxic Materials and Waste	No change in baseline conditions for management of hazardous materials, toxic substances, or hazardous waste. Overall there would continue to be a long-term, minor adverse effect to HWTM based on everyday military operations and military vehicle maintenance.	Short- and long-term, minor adverse impacts from expansion of FPs and maintenance activities. Short-term, minor adverse impacts from aerial herbicide application for K15 LOS restoration.	Same as Alternative 1 for expansion of FPs, aerial herbicide application for K15 LOS restoration, and maintenance activities. Short-term, minor adverse impacts due to release of hazardous chemical constituents from in-place detonation of UXOs.
Biological Resources *Vegetation*	Potential for long-term beneficial impacts to from natural resources management practices. Minor to moderate adverse impacts from operational training.	Impacts would range from to short-term minor, adverse to long-term negligible. Minor, adverse impacts would be due to loss of vegetation from FP expansions. Short-term, moderate adverse impacts from aerial herbicide application for K15 LOS restoration. Negligible impacts to vegetation would result from maintenance activities in the long-term.	Same as Alternative 1.

VEC	No Action Alternative	Alternative 1	Alternative 2 (The Preferred Alternative)
Biological Resources *Species of Concern*	Overall impacts to special status species would range from no impact to potential moderate, adverse impacts from current levels of operational training. There would be a potential for long-term, beneficial impacts to biological resources, especially the RCW, Gopher Tortoise, and longleaf pine ecosystem through the current level of resource management efforts at Fort Benning, as well as, the ongoing implementation of the ACUB program.	Short- and long-term minor adverse impacts to RCW and Gopher Tortoise from vegetation removals for FP expansions. Short-term, moderate adverse impacts from aerial herbicide application for K15 LOS restoration. Negligible impacts to RCW and Gopher Tortoise from maintenance activities in the long-term. Potential for long-term beneficial impacts though the current level of resource management efforts.	Same as Alternative 1.
Geology and Soils	No impacts to geology. Present training activities would continue to have minor, to moderate impacts to soils from everyday training events due to the natural erodibility characteristics of Fort Benning soils and rainfall events. Land management practices would result in long-term, minor impacts to soils.	No impacts to geology. Short-term, minor adverse effects to soils could occur during expansions of FPs. Soils erosion and sedimentation impacts from vegetation losses due to aerial application of herbicide would be short-term and minor. Long-term maintenance activities would result in minor, adverse impacts.	Same as Alternative 1 for expansion of FPs, aerial herbicide application for K15 LOS restoration, and maintenance activities. Short-term, minor adverse impacts due to land disturbances from in-place detonation of UXOs.
Water Resources	Present training activities would continue to have minor, to moderate impacts to soils from everyday training events due to the natural erodibility characteristics of Fort Benning soils and rainfall events. Land management practices would result in long-term, minor impacts to soils.	Short-term, minor adverse effects to water resources could occur during expansions of FPs. Soils erosion and sedimentation impacts from vegetation losses due to aerial application of herbicide would be short-term and minor. Long-term maintenance activities would result in minor, adverse impacts.	Same as Alternative 1 for expansion of FPs, aerial herbicide application for K15 LOS restoration, and maintenance activities. Short-term, minor adverse impacts due to land disturbances from in-place detonation of UXOs.

4.0 CUMULATIVE IMPACTS

In addition to identifying the direct and indirect environmental impacts of their actions, the CEQ's and the Army's NEPA regulations require federal agencies to address cumulative impacts related to their proposals. A cumulative impact is defined in the CEQ *Cumulative Impact* regulations as: "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR §1508.7)."

4.1 Process for Identifying Cumulative Impacts

CEQ has published guidance for assessing cumulative impacts in *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997b). In summary, the process outlined by CEQ includes identifying significant cumulative effects issues; establishing the relevant geographic and temporal (time frame) extent of the cumulative effects analysis; identifying other actions affecting the resources of concern; establishing the cause-and-effect relationship between the Proposed Action and the cumulative impacts; determining the magnitude and significance of the cumulative effects; and identifying ways in which the agency's proposal might be modified to avoid, minimize, or mitigate adverse, cumulative impacts.

CEQ regulations specify that cumulative impacts analyses encompass past, present, and reasonably foreseeable future actions. As a practical matter, past actions are generally included in the baseline described in the affected environment in Chapter 3; therefore, past actions that are part of the baseline are not included. Only in unique circumstances are past actions not included in the baseline and addressed in the cumulative impacts analysis. Past, present, and reasonably foreseeable future actions considered in the analysis are identified in Section 4.2.

Issues to be addressed in this cumulative impacts analysis correspond to the VECs that the Alternatives have the potential to affect. Several resource categories, or VECs, — Airspace, Cultural Resources, Land Use, Energy and Utilities, Facilities and Infrastructure, Noise, Socioeconomics, Environmental Justice and Protection of Children, Traffic and Transportation, and Safety — would have no or negligible impacts under the Proposed Action, so these resource categories are not carried forward for cumulative impacts analysis. The No Action alternative would not change the status quo, and cumulative impacts would have been considered in prior NEPA analysis for prior project and those currently underway. Therefore, no cumulative analysis is needed for the No Action Alternative.

An ROI was defined for each resource in Chapter 3. These ROIs represent the geographic areas within which all notable impacts from the Proposed Action and Alternatives are expected to occur. The geographic extent of the cumulative impacts analysis generally coincides with the ROI of each resource and is described by resource in Section 4.3. In addition, significance thresholds defined for each resource in Chapter 3 also apply to the assessment of cumulative impacts.

4.2 Past, Present and Reasonably Foreseeable Future Actions

In general, this EA considers present and reasonable foreseeable future actions as those actions that are under construction or are approved and have identified funding. Actions beyond that become increasingly speculative and difficult to assess.

- **Army 2020 Force Structure Realignment (FY13 – FY 2020)---** In 2013, the Army prepared a Programmatic EA (PEA) to analyze the potential environmental and socioeconomic impacts associated with a proposed action consisting of a reduction in active Army end-strength from 562,000 to 490,000. Since the 2013 PEA was completed, Department of Defense (DoD) fiscal guidance has continued to change, and the future end-strength of the Army must be reduced even further. This came about primarily because the second part of the 2011 Budget Control Act, commonly referred to as sequestration, went into effect. This further reduction was analyzed in a Supplemental PEA for Army Force Structure Realignment that focused on reducing Brigade Combat Teams (BCTs) Army-wide. However, the Army's forces structure decision for Fort Benning consisted of the inactivation of the 3rd ID BCT(a loss of approximately 3,400 Soldiers), and the activation of the 1-28th Infantry Brigade Task Force (IBTF) that consists of approximately 1,080 Soldiers. Although a task force is usually considered a temporary organization, the IBTF proposed for conversion at Fort Benning is actually a permanent part of Army force structure. Such task forces offer commanders the option to grow rapidly to create a BCT, if needed. The task force allows the Army to maintain some combat power capability and also allows "reversibility" without completely eliminating a brigade. The conversion to an IBTF was analyzed in the Enhanced Training EA for Fort Benning, with a FNSI signed on 6 October, 2015**.**

- **Army Compatible Use Buffer Program (ACUB) (FY 09 to Present)** – Originally developed in 2004-2005, the proposed ACUB Program outlined a rational and approach to identify buffer lands that would facilitate Army training by channeling incompatible growth and development away from critical portions of Fort Benning's boundary, reducing conflicts between the training mission and its environmental stewardship responsibilities. Through no-development easements, conservation easements, and conservation focused land acquisitions, Fort Benning has made a substantial commitment to its ACUB program emphasizing multiple conservation benefits from buffering encroachment to protection and restoration of protected/listed species habitat. In 2009 the Army's Biological Assessment for the Maneuver Center of Excellence (MCoE) proposed to accelerate the ACUB program at Fort Benning and to develop and implement a "Red-cockaded Woodpecker Off-Post Conservation Plan." Currently, the ACUB Program has protected approximately 20,000 acres with a goal to protect 40,000 acres by 2020 (DA 2015). Priority Zones for conservation through the ACUB Program are illustrated in Figure 16.

- **Chattahoochee Fall Line Wildlife Management Area (FY 14)** — Two areas comprised of 10,800 acres spanning north central Marion County and southern Talbot County was created by a partnership between the Georgia Department of Natural Resources, The Nature Conservancy, and Fort Benning through the ACUB Program. This new Wildlife Management Area provides opportunities for outdoor recreational activities, such as hunting, hiking, camping, and bird-watching. It will serve as a demonstration site for longleaf pine ecosystem restoration, an ecosystem that provides important habitat for wildlife, including both game and non-game species, the Federally Endangered RCW, and Georgia's official reptile (and candidate species for Federal listing), the gopher tortoise. The Georgia Department of Natural Resources and The Nature Conservancy jointly manage the property as illustrated in Figure 16.

- **Infrastructure Footprint Reduction Program (FY 14 – 18) ---** An Army-mandated program to eliminate underutilized and outdated facilities and achieve affordability in base operations. Each fiscal year, Fort Benning Master Planning Division identifies structures to be demolished to meet the program goal and consolidates facility functions and personnel into fewer buildings with more effective space utilization. The number and types of facilities and/or buildings to be demolished vary from year to year based on Installation needs and military mission.

- **Implementation of a 30-Megawatt (MW) Photovoltaic (PV) Solar Facility (FY 15) and Fort Benning 2 PV Solar Project (FY18)** — In 2014, Fort Benning prepared an EA for the construction, operation, and maintenance of a 30-MW PV solar system on approximately 250 acres of land on Fort Benning located at the Dove Field near the western boundary of Fort Benning within Russell County, Alabama. Final design of the PV system did not require use of the entire 250 acre parcel. Due to the Army's commitment to achieve renewable energy production in accordance with the *Energy Performance Goal and Master Plan for the Department of Defense* (10 USC 2911[e]), approximately 80 acres of the originally evaluated site are being considered for the construction, operation, and maintenance of an addition to the existing solar array to produce supplementary renewable energy for the Installation as illustrated in Figure 16.

- **Fielding of the Enhanced Performance Round (FY 15 and beyond) —** A DoD initiative to improve munitions performance, as well as satisfy a component of the Army's "Green Ammunition" program to create environmentally friendly, small arms ammunition to reduce lead accumulation at training ranges. The current lead-core 5.56mm and 7.62mmball ammunition will be replaced with a copper-core, which has fewer adverse environmental impacts and concurrently provides better shooting accuracy, consistency, and increased penetrating capability.

- **Army Reconnaissance Course (ARC) Training Locations (FY 16 and beyond)** — Increasing the number of training areas available to the ARC to conduct reconnaissance training using wheeled vehicles for on-road and dismounted maneuver exercises. The heavy, tracked vehicle off-road maneuver component of ARC training is being conducted in the Good Hope Maneuver Training Area (illustrated in Figure 16), which is currently under construction to provide additional trails and other infrastructure to support off-road heavy maneuver training requirements.

- **US Army Military Advisor Training Academy (MATA) and Security Forces Assistance Brigade Stationing Actions (FY18 and beyond)** – The US Army Military Advisor Training Academy (MATA) is a new unit specially trained and built to serve as the cadre and instructors for the Combat Advisor Training Course (CATC). The CATC is focused on training combat advisors to serve as members within the newly formed and permanent units called Security Force Assistance Brigades (SFABs). SFABs are deployable Brigade of selected combat advisors that support a Combatant Commander that integrates with foreign partner forces, assists and advises local security operations to build security in support of US Nation Interests. Fort Benning received the first of six Army planned SFABs, and may be receiving one additional SFAB in the future. Currently the SFAB and MATA occupy existing facilities on Kelley Hill that were formerly occupied by the 3rd ID HBCT. Training for the SFAB unit consists primarily of classroom instruction on principles of military operations, psychology, culture, and government and civil structures, and foreign language development. Field training primarily consists of maintaining small arms marksmanship qualifications. Future plans consist of constructing a MATA campus in Harmony Church as illustrated in Figure 16.
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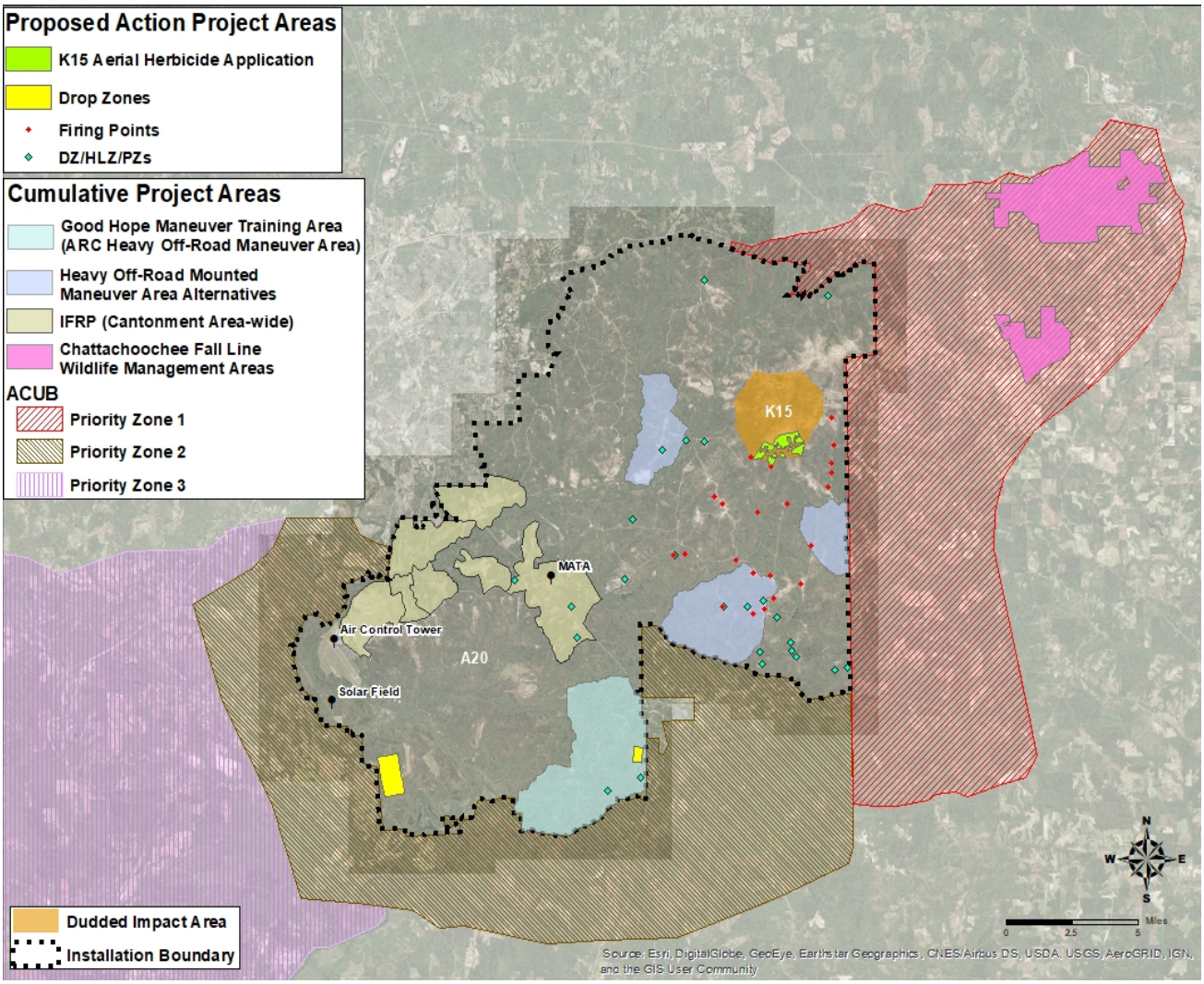
- **Lawson Army Airfield Control Tower (PN55112 - FY18)** — This project is required to ensure safe and efficient air traffic services is available to support Fort Benning and the military flying community. The project is required to provide air traffic control instructions and flight services to Lawson Army Airfield, and the Fort Benning Military Operations Area as illustrated in Figure 16. The project supports the readiness and deployment platforms for the Ranger Battalion and the Basic Airborne Course. The current Air Traffic Control Tower (ATCT) was constructed in 1967 and a new ATCT is needed o meet the military operations tempo.

- **Heavy Mounted Off-Road Maneuver Training Area (MMTA) (FY 24)** – Development a 2,700-6,300 acre contiguous MMTA for armor vehicle movement and maneuver to support force-on-force formations. This will require the construction of tank trails, low water crossings, training area bridges, and support facilities; also some roads will be upgraded to a minimum 10" concrete surface and require concrete culverts and concrete road crossings. Three areas on Fort Benning have been identified as Reasonable Alternatives for this action, and are illustrated in Figure 16.

Figure 16. Past, Present and Reasonably Foreseeable Future Actions



4.3 Cumulative Impacts by Resource

Analysis of the Proposed Action and Alternatives resulted in a finding of short-term, minor to moderate adverse effects on Air Quality, Biological Resources, Hazardous and Toxic Materials and Wastes, Geology and Soils, and Water Resources that will be further analyzed in this section of the EA. As shown in the below analysis, these minor and moderate adverse impacts do not result in significant adverse cumulative effects when considering all other past, present, and reasonably foreseeable future construction and/or maintenance activities at Fort Benning.

4.3.1 Air Quality

For the Action Alternatives and cumulative projects listed in Section 4.2, short-term, minor adverse impacts to air quality from fugitive dust from construction activities, emissions from heavy construction equipment, and aerial application of herbicide. In the long-term, the impacts to air quality would be negligible, to minor due to the potential for fugitive dust and emissions from heavy construction equipment used for the maintenance activities to sustain the functionality of FPs and DZ/HLZ/PZs. However, there exists the potential for long-term beneficial effects to emissions from the Infrastructure Footprint Reduction Program (IFRP) with the elimination of out-dated, sub-optimal chiller, boilers, and heating/cooling systems contributing to Fort Benning's Title V permit for stationary air emission sources.

Overall long-term impacts to air quality would be minor, and therefore no significant cumulative impacts would be anticipated.

4.3.2 Hazardous and Toxic Materials and Waste

For the Action Alternatives and cumulative projects listed in Section 4.2, minor, short-term increases in the use and handling of hazardous materials and waste would be associated with construction activities and aerial application of herbicides. Demolition activities associated with the IFRP would also lead to minor increase in hazardous materials and waste generation, but will be disposed of in accordance with all applicable Federal, State, and Army regulations, and will not exceed the capacity of local and/or regional disposal facilities.

Overall, long-term impacts of the use, storage, handling, and disposal of Hazardous Materials and Waste would be minor, and therefore no significant cumulative impacts would be anticipated.

4.3.3 Biological Resources

For the Action Alternatives and cumulative projects listed in Section 4.2, biological resources would continue to be affected at the current level resource management, operational training, and maintenance activities. Impacts are expected to be short-term, moderate adverse from vegetation removals for construction and land disturbing activities with the implementation of the Heavy Off-Road Mounted Maneuver Training Area (HOMMTA) project.

For the Action Alternatives and cumulative projects listed in Section 4.2, there would be short-term, moderate adverse impacts to RCWs and Gopher Tortoises, due to vegetation removals from the aerial herbicide application for LOS restoration in the K15 dudded impact area. Implementation of the HOMMTA would cause the greatest impacts to RCWs and Gopher Tortoises. However, these impacts will be minimized by Fort Benning's proactive management activities through its INRMP, Gopher Tortoise ESMC, RCW ESMC, and the 2007 RCW Management Guidelines. Per the 2018 RCW ESMC Update, the USFWS's BO has made a determination that there are no cumulative effects known to occur that will affect the RCW population range-wide, and that the Action Alternatives will not likely jeopardize the continued existence of RCWs.

In the long-term, there would be negligible impacts to biological resources from maintenance activities in the training areas. In addition, there would be a potential for beneficial impacts to biological resources, especially the RCW, Gopher Tortoise, and longleaf pine ecosystem through the current level of resource management efforts at Fort Benning, as well as, the ongoing implementation of the ACUB program and establishment of WMAs for habitat and species conservation.

4.3.4 Geology and Soils

For the Action Alternatives and cumulative projects listed in Section 4.2, short-term, minor adverse impacts to soils could occur from land disturbances during construction, training, and maintenance activities. Impacts to soils are most likely to occur during rain events on active construction sites that may increase the potential for runoff and soil erosion, however, these impacts would be minimized through adherence to NPDES construction permitting requirements. There would also be short-term minor, adverse impacts from to soils from application of herbicides and pesticides, but would be minimized by using products in accordance with all manufacturer's labels and EPA guidance, and by using products that have short residual times. There is a potential for minor beneficial impacts to munitions contaminations with the field of the Enhanced Performance Round that replaces the lead component of 5.56 and 7.62mm munitions with copper, which has fewer adverse environmental impacts based on material toxicity characteristics.

Overall long-term impacts to soils would be potentially moderate adverse due to disturbances from training activities, but potential impacts would be minimized though ITAM maintenance activities to repair training damage. No significant cumulative impacts to soils would be anticipated.

4.3.5 Water Resources

For the Action Alternatives and cumulative projects listed in Section 4.2, short-term, minor adverse impacts to water resources could occur during construction activities. Impacts to water resources are most likely to occur during rain events on active construction sites that may increase the potential for runoff, soil erosion, and surface contamination from pollutants such as hazardous materials and/or waste. However, these impacts would be minimized through adherence to CWA regulations and NPDES construction permitting requirements. Overall long-term impacts would be potentially moderate adverse due to soils disturbances from training activities, but potential impacts would be minimized though ITAM maintenance activities to repair training damage. No significant cumulative impacts to Water Resources would be anticipated.

5.0 CONCLUSIONS

Fourteen environmental resources were evaluated for potential impacts in relation to the implementation of the Action Alternatives. Of these environmental resources it was determined that there would be no, or negligible impacts to Airspace, Cultural Resources, Land Use, Energy and Utilities, Facilities and Infrastructure, Noise, Socioeconomics, Environmental Justice, and Protection of Children, Traffic and Transportation, and Safety. Therefore, these resources were not carried further in the analysis presented in this EA.

The analysis contained in this EA indicates that both of the Action Alternatives would have at worst only short-and long-term, minor adverse effects to Air Quality, Hazardous and Toxic Materials and Waste, Geology and Soils, and Water Resources from vegetation removals, aerial application of herbicides for restoration of LOS to K15 targetry, and maintenance activities associated with the Action Alternatives. For Biological Resources, impacts to RCWs, Gopher Tortoises, vegetation would be moderate adverse in the short-term.

For both Action Alternatives, the Army and USFWS determined that the proposed aerial herbicide application is likely to adversely affect RCW cluster K15-D due to loss of habitat. Fort Benning, through formal consultation with a 2018 update to its RCW ESMC, requested to amend the authorized actions of the incidental take to RCW cluster K15-D to include required maintenance activities necessary to restore LOS to the targetry located in the center of K15 that would maintain military mission capability. After reviewing the current status of the species, and the effects of the Action Alternatives and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of RCWs. However, USFWS requires implementation of mitigation measures to minimize the impact of the incidental take incurred by the aerial herbicide application within the K15 dudded impact area. As discussed in detail in Section 3.4.1.6, Fort Benning will confer with USFWS on the herbicide to be used and develop and herbicide application plan, as well as a monitoring and inspection plan to determine the effects of the application.

In the long-term, impacts to Biological Resources would be negligible from maintenance activities in the training areas. In addition, there would be a potential for beneficial impacts to biological resources, especially the RCW, Gopher Tortoise, and longleaf pine ecosystem through the current level of resource management efforts at Fort Benning through implementation of the Installation's INRMP, as well as, the ongoing implementation of the ACUB program and establishment of WMAs for habitat and species conservation.

The level of impacts to the VECs carried forward for analysis are similar between Alternative 1 and Alternative 2. Although the is a potential for an minor increase in impacts to from implementation of Alternative 2, due to the addition of UXO removals to restore the functionality of Hartell Bunker as an OP, none of the impacts are considered significant. Implementation of Alternative 2 is preferred due to the flexibility it provides indirect fire training exercises by providing a full southern arc of LOS to aid in artillery and mortar training.

As discussed in Section 4.0, these minor and moderate adverse impacts do not result in significant adverse cumulative effects when considering all other past, present, and reasonably foreseeable future construction and/or maintenance activities at Fort Benning. In addition, adherence to Federal and State laws and regulations, as well as Installation management plans, and Army Regulations would minimize impacts of construction and maintenance activities to sustain the open field training environments needed to support artillery, Airborne, and Ranger training missions.

Based on the analysis presented in this EA, implementation of either of the Action Alternatives would not have significant direct, indirect, or cumulative effects on the natural or human environment. As such, a FNSI is warranted for either of the Proposed Action Alternatives and does not require the preparation of an EIS.

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7.0 ACRONYMS AND ABBREVIATIONS

AR	Army Regulation
ARTB	Airborne and Ranger Training Brigade
ARTEP	Army Training and Evaluation Program
BA^2	Basal Area
BO	Biological Opinion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DA	Department of the Army
DBH	Diameter at Breast Height
DZ	Drop Zone
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESMC	Endangered Species Management Component
ESMP	Endangered Species Management Plan
FA	Field Artillery
FEMA	Federal Emergency Management Agency
FM	Field Manual
FNSI	Finding of No Significant Impact
FORSCOM	U.S. Army Forces Command
FP	Firing Point
ft	Foot/Feet
HLZ	Helicopter Landing Zone
HMMWV	High Mobility Multi-Purpose Wheeled Vehicles
HMU	Habitat Management Unit

INRMP	Integrated Natural Resources Management Plan
IPMP	Installation Pest Management Plan
LOS	Line-of-Sight
LZ	Landing Zone
M&R	Monitoring and Reporting
MOS	Military Occupational Specialty
NEPA	National Environmental Policy Act
OP	Observation Point
POI	Program of Instruction
PZ	Pick-up Zone
RPM	Reasonable and Prudent Measure
T&C	Terms and Conditions
TRADOC	US Army Training and Doctrine Command
US	United States
USAIS	United States Army Infantry School
UXO	Unexploded Ordnance

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APPENDIX A

DRAFT FINDING OF NO SIGNIFICANT IMPACT

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1 Introduction

Fort Benning has prepared this draft environmental assessment (EA) to examine the potential environmental effects of improvements to Field Artillery Training assets and maintenance activities to support training and operations. This EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); the regulations of the President's Council on Environmental Quality (CEQ); United States (U.S.) Department of the Army (Army) Regulation 200-1, and Army NEPA Regulation (32 Code of Federal Regulations (CFR) Part 651).

This EA is a public document that will be used to determine and evaluate the potential environmental consequences of the Proposed Action, identify possible/potential mitigation measures to lessen or eliminate adverse effects, and examine reasonable alternatives to the Proposed Action. The intended audience of the EA is Army decision-makers; interested government agencies; and non-governmental organizations, Federally recognized Native American Tribes, and members of the public. The effects analyses in this EA are based on a variety of sources and the best available information at the time of preparation. The information contained in this EA will be reviewed and considered by the Army prior to a final decision on how to proceed with the implementation of the Proposed Action, if at all.

2 Background

In 2015, in conjunction with two other actions, Fort Benning prepared the *Enhanced Training at Fort Benning, Georgia* EA to analyze the impacts of the 3rd ID's conversion from an ABCT to an IBCT. However, prior to the completion of a Finding of No Significant Impact (FNSI) for the 3rd ID's conversion to an IBCT, the Army announced on 9 July 2015 that Fort Benning would lose approximately 3,400 Soldiers. This reduction in force would then involve the conversion of the 3rd ID ABCT to an Infantry Battalion Task Force (IBTF) consisting of approximately 1,080 Soldiers rather than conversion to an IBCT of approximately 4,000 Soldiers. Therefore, the force structure at Fort Benning was transformed in FY16 with the deactivation of the 3rd ID ABCT and the subsequent activation of the 1-28th IBTF to meet Army Force Structure decisions.

At the time of these decisions, it was not entirely well-defined as to what type of maneuver and support units an IBTF would be comprised of, as well as vehicles and training requirements. Ultimately, the 1-28th IBTF became composed of Soldiers from the inactivated battalions that previously formed the 3rd ABCT, and consists of infantry squads, engineers, cavalry scouts, artillery, and support personnel (Wright 2016). Concurrent with these Army Force Structure decisions, new field artillery requirements were being developed with the modernization of the M119 and M777 Howitzer weapon systems to include Global Positioning System (GPS) hardware and software to improve navigation and digital communications for receiving firing data, as well as structural redesigns to reduce recoil and the overall weight to improve mobility.

At its most basic level, an artillery piece is a crew-served weapon that propels a relatively large projectile far beyond the range and power of Infantry's small arms. Artillery usually refers to shell-firing guns, howitzers, mortars, rockets, and guided missiles, but can also utilize non-lethal munitions such as smoke and illumination rounds to either obscure the enemy's visibility or aid ground operations that occur at night. The field artillery is organized into light, medium, and heavy artillery on the basis of weapon caliber.

Previously, the artillery components of the 3rd ID ABCT consisted of self-propelled M1064 Mortar carriers and Paladins (155mm Howitzer gun) that were highly mobile artillery pieces mounted on tracked vehicles. With the deactivation of the 3rd ID, the Paladin and M1064 Mortar carrier artillery weapon systems are no

longer at Fort Benning. In contrast, current artillery weapon systems that support the mission of the 1-28 IBTF consist of light (M119A3) and medium (M777A2) howitzers that fire 105mm and 155mm caliber munitions (respectively), that are towable with high mobility multi-purpose wheeled vehicles (HMMWV), and can also be transported to firing positions with helicopters and fixed-wing aircraft. Mortars weapon systems of the 1-28th IBTF consist of 60mm (M224) and 81mm (M252) which could be hand carried in the field, and the 120mm (M120/121) which is heavier and requires transport via a trailer towed by a HMMWV, or mounted onto an armored personnel carrier. Heavy artillery guns of 203mm or more in caliber, have not, and will not be used by field artillery units at Fort Benning.

This transition from tracked to towed artillery weapon systems was not captured in the *Enhanced Training* EA due to the Army's reconsideration of the force structure decisions post-document completion, as well as the uncertainty of the organization of supporting units (e.g. infantry, engineer, medical, etc.), that would comprise an IBTF, including the equipment required to accomplish their mission. Now that the organization, vehicles, and weapons systems to support the IBTF mission have been established, corresponding needs have been identified to support their training, specifically for the artillery components of the 1-28th.

3 Purpose and Need

Since the terrorist attacks of September 11, 2001, two of Fort Benning's major tenant units, (the 75th Rangers and the 3rd ID), were in a steady cycle of combat deployments to Iraq and Afghanistan through 2014 when combat operations were officially ended in those countries (DeYoung 2014). As such, many of the existing training assets/areas to support training with artillery and aviation components (primarily rotary-wing aircraft), were not utilized or maintained on a regular basis. Consequently, a majority of the existing FPs and smaller HLZ/PZs throughout the training areas have been encroached with vegetation within and along the perimeters of their footprints, and many have soil erosion issues resulting in irregular, uneven, and rutted surfaces.

With the recent Army Force Structure decisions to establish the 1-28th IBTF at Fort Benning, the weapons system and training requirements of the artillery support unit have changed. The transition from self-propelled, tracked Paladins and mortar carriers to HMMWV towable artillery and mortar guns will require improvements to the existing FPs that support indirect fires into the K15 dudded impact area. Field artillery units of the 1-28th IBTF are organized based on the number of guns to be employed in firing operations. The number of guns employed dictates the dimensions of the area required to occupy a FP, as there are dispersal distances between gun positions to ensure safe firing operations.

For artillery operations to function safely at full capabilities, FPs must consist of large areas with flat topography and be clear of obstructions that could create hazards to Soldiers and equipment. Access roads to FPs must also be flat and free of obstructions as artillery and mortar elements will be towed with HMMWVs. To ensure the functionality and sustainability of these FPs and access roads, long-term maintenance activities must be implemented to provide operational training of the open field training environment. Additionally, the targets must be visible to the FO to relay the target position information to the FDC to determine the settings and adjustments the field artillery gunners must make to hit the intended target. This requires a clear LOS from an OP to a target. However, vegetation within the K15 dudded impact area currently impairs the visibility of the intended targets and reduces training capabilities. Vegetation removals will be required to support the mission of the artillery units at Fort Benning.

4 Description of the Proposed Action

The Proposed Action would provide improvements and long-term maintenance activities to current training assets primarily needed to support the missions and Programs of Instruction (POIs) of the Airborne and Ranger Training Brigade (ARTB), 75th Rangers, and the Field Artillery units of the Infantry School and the 1-28th Infantry Battalion Task Force (IBTF), as well as other tenant and/or visiting units' training requirements. These assets include Drop Zones (DZs), Helicopter Landing Zones/Pick-up Zones (HLZ/PZs), Observation Points (OPs), and Firing Points (FPs) for Mortars and Howitzer guns, and are generally referred to as the "open field training environment". Improvements to these assets could include new construction of erosion and sedimentation control structures; disking, grading, and stabilizing areas to improve access for Soldiers and equipment; footprint expansions and new construction to accommodate military equipment configurations and training requirements; and removal of obstacles/hazards (e.g. trees and vegetation, road grading and stabilization, etc.), for approach/departure clear zones of HLZ/PZs, and DZs for aircraft, equipment, and Soldier safety.

5 Description of the Alternatives

There are two Action Alternatives proposed to improve Field Artillery training assets and to support Airborne and Ranger aerial training. Both Alternatives also include maintenance activities in the short- and long-term to sustain the operational open field environment. One Alternative also includes the restoration of an inactive training site to support artillery training. Chapter 2 discusses the Action Alternatives in detail, as well as the No Action Alternative. The final decision of which alternatives to implement will be documented in either a FNSI if no significant environmental impacts are expected, or a Notice of Intent (NOI) to prepare an EIS if significant impacts are expected to occur as a result of the alternatives. A FNSI will identify the Army's selected alternative and identify mitigation measures that are essential to the reduction of identified impacts. In making the decision, the Army will select among the three alternatives described in Chapter 2.

The Army used screening criteria to determine which Alternatives are reasonable. Satisfaction of these screening criteria would provide an Alternative suited to meet the purpose of and need for the Proposed Action, while potentially minimizing adverse environmental impacts, and support the mission needs for Field Artillery, Airborne, and Ranger units, as well as other tenant and/or visiting units' training requirements. The following criteria (in no particular order of importance) have been used to determine whether or not an alternative would be considered reasonable and carried forth for further consideration within this EA:

- The Proposed Action should enhance and support the ability of Fort Benning to conduct its training missions and allow for flexibility in planning for future training requirements
- The Proposed Action should improve and maintain existing training assets to ensure safety and accessibility for Soldiers, vehicles, aircraft and weapon systems, and promote the sustainability of training lands
- Implementation the components of the Proposed Action should minimize environmental impacts to the extent feasible

6 Anticipated Environmental Effects

The analysis contained in this EA indicates that both of the Action Alternatives would have at worst only short-and long-term, minor adverse effects to Air Quality, Hazardous and Toxic Materials and Waste,

Geology and Soils, and Water Resources from vegetation removals, aerial application of herbicides for restoration of LOS to K15 targetry, and maintenance activities associated with the Action Alternatives. For Biological Resources, impacts to RCWs, Gopher Tortoises, vegetation would be moderate adverse in the short-term.

For both Action Alternatives, the Army and USFWS determined that the proposed aerial herbicide application is likely to adversely affect RCW cluster K15-D due to loss of habitat. Fort Benning, through formal consultation with a 2018 update to its RCW ESMC, requested to amend the authorized actions of the incidental take to RCW cluster K15-D to include required maintenance activities necessary to restore LOS to the targetry located in the center of K15 that would maintain military mission capability. After reviewing the current status of the species, and the effects of the Action Alternatives and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of RCWs.

In the long-term, impacts to Biological Resources would be negligible from maintenance activities in the training areas. In addition, there would be a potential for beneficial impacts to biological resources, especially the RCW, Gopher Tortoise, and longleaf pine ecosystem through the current level of resource management efforts at Fort Benning through implementation of the Installation's INRMP, as well as, the ongoing implementation of the ACUB program and establishment of WMAs for habitat and species conservation.

The level of impacts to the VECs carried forward for analysis are similar between Alternative 1 and Alternative 2. Although the is a potential for an minor increase in impacts to from implementation of Alternative 2, due to the addition of UXO removals to restore the functionality of Hartell Bunker as an OP, none of the impacts are considered significant. Implementation of Alternative 2 is preferred due to the flexibility it provides indirect fire training exercises by providing a full southern arc of LOS to aid in artillery and mortar training.

As discussed in Section 4.0, these minor and moderate adverse impacts do not result in significant adverse cumulative effects when considering all other past, present, and reasonably foreseeable future construction and/or maintenance activities at Fort Benning. In addition, adherence to Federal and State laws and regulations, as well as Installation management plans, and Army Regulations would minimize impacts of construction and maintenance activities to sustain the open field training environments needed to support artillery, Airborne, and Ranger training missions.

Based on the analysis presented in this EA, implementation of either of the Action Alternatives would not have significant direct, indirect, or cumulative effects on the natural or human environment. As such, a FNSI is warranted for either of the Proposed Action Alternatives and does not require the preparation of an EIS.

7 Mitigation Measures

Adherence to Federal and State laws and regulations, as well as Installation management plans, and Army Regulations are required to minimize impacts of construction and maintenance activities to sustain the open field training environments needed to support artillery, Airborne, and Ranger training missions. Furthermore, the USFWS requires mitigation to minimize the impact of the incidental take incurred by the aerial herbicide application within the K15 dudded impact area. Fort Benning will confer with USFWS on the herbicide to be used and develop and herbicide application plan, as well as a monitoring and inspection plan to determine the effects of the application as discussed in Section 3.4.1.6 of the EA.

8 Public Availability

The Final EA and Draft Finding of No Significant Impact (FNSI) were made available to the public for a 30-day public comment period from March 28, 2019 – April 27, 2019. An announcement that these documents are available was published via a Notice of Availability (NOA) in The Columbus Ledger-Enquirer, The Journal, and Benning News (online) in accordance with the Army NEPA Regulation. These documents are also available at several local libraries and are posted on the Fort Benning website at http://www.benning.army.mil/Garrison/DPW/EMD/Legal.html.

The NOA of the Final EA and Draft FNSI has been mailed to all agencies, individuals, and organizations on the Fort Benning NEPA distribution (mailing) list for the Proposed Action. As part of Fort Benning's on-going, established process and dialogue with the federally recognized Native American Tribes affiliated with the Fort Benning area, the Army has provided each Tribe with a copy of these documents for consultation via review and comment.

9 Conclusions

In consideration of the analysis in the EA, I have decided to implement the Preferred Alternative. Implementation of either Action Alternative or the No Action would not have a significant impact on the quality of human life or natural environment. The Preferred Alternative would meet the purpose and need of the Proposed Action by allowing improvements and long-term maintenance activities to current training assets necessary to support the missions and POIs of the ARTB, 75th Rangers, and the Field Artillery units of the Infantry School and the 1-28th IBTF, as well as other tenant and/or visiting units' training requirements.

A FNSI is warranted for this Proposed Action and does not require the preparation of an Environmental Impact Statement (EIS). This analysis fulfills the requirements of the NEPA of 1969, as implemented by the Council on Environmental Quality regulations (40 CFR 1500–1508), as well as the requirements of the Environmental Analysis of Army Actions (32 CFR 651).

FINDING OF NO SIGNIFICANT IMPACT REVIEWED AND APPROVED BY:

_____ _____

Clinton W. Cox
Colonel, U.S. Army
Garrison Commander

Date

APPENDIX B

RCW ESMC

APPENDIX 18 – K15 INCIDENTAL TAKE

FORT BENNING, GEORGIA

RED-COCKADED WOODPECKER (*PICOIDES BOREALIS*)

ENDANGERED SPECIES MANAGEMENT COMPONENT

FORT BENNING, GEORGIA

29 JUNE 2018 UPDATE

APPENDIX 18

PROPOSAL TO AMEND THE ACTION FOR THE INCIDETNAL TAKE AUTHORIZATION IN THE K15 DUDDED IMPACT AREA FOR RCW CLUSTER K-15D

1. Introduction:

The 2002 Red-cockaded Woodpecker (RCW) Endangered Species Management Plan authorized 4 incidental takes for RCW groups believed to exist in the K15 dudded impact area (K15) due to anticipated effects from the high explosive ordnance fired into this area and or from wildfires caused by those munitions. The Installation requested and was authorized incidental take coverage to continue in the 2014 RCW Endangered Species Management Component (ESMC) for the 4 RCW groups that were believed to still exist within K15 that were verified from 2009 aerial surveys, as well as for any unknown or future clusters that could form through natural expansion in K15. Cluster delineations were made using active/inactive cavity tree locations and subsequent geospatial analysis (Figure 1).

All 4 of the RCW groups located within K15 are within an area that the Directorate of Plans, Training, Mobilization and Security (DPTMS) and the Explosive Ordnance Detachment (EOD) personnel currently and historically have identified as having the potential to contain types and quantities of Unexploded Ordnance (UXO) that are deemed too hazardous for personnel to safely access from the ground. Therefore, no monitoring or management for RCWs have ever occurred historically or will ever take place in K15 as this area is off limits to ground access for all personnel.

2. Proposed Action:

Fort Benning requests to amend the authorized actions to one of these 4 incidental takes located in the southeastern corner of the K15 (RCW cluster K15-D) to include required maintenance activities necessary to restore line-of-site (LOS) to the targetry located in the center of K15 to maintain military mission capability. The restoration of LOS requires removal of overstory hardwood and pine trees via an aerial application of herbicide within an area of up to 530 acres in the K15 dudded impact area.

3. Species Considered:

Red-cockaded woodpecker (*Picoides borealis*) is the only known federally listed species considered. Since the entire K15 area is contaminated with UXO, the site is off limits to ground access for all personnel. Therefore the only baseline surveys ever conducted of the area to date was an aerial survey conducted in 2009 with rotary-winged aircraft. Since funding was unavailable to support resurveying the K15 compartment aerially with rotary-winged aircraft, an unsuccessful attempt was made using remote controlled, fixed-winged drones in April 2018. The video images generated from the drones could not provide sufficient image resolution to definitively identify RCW cavity trees or activity status.

4. Background:

The K15 impact area currently and historically has been used to support large caliber weapon systems live-fire military training. The mission of field artillery is to destroy, neutralize, or suppress the enemy by indirect fire, and to help integrate all fire support assets (such as air, armor, and infantry), into a combined arms operation. Unlike other weaponry, artillery pieces fire munitions without reliance upon a direct LOS between the gun and its target. This is referred to as "indirect fire" where the aiming of the artillery weapon is performed by calculating azimuth and elevation angles in relation to minimum and maximum range of the artillery munitions and target locations. As such, the effectiveness of artillery is dependent upon the position of the gun line where the artillery weapons are positioned [referred to as a firing point (FP), and a "forward observer" (FO)]. Because artillery is an indirect fire weapon, the forward observer must take up a position, referred to as an "observation point" (OP), where they can observe the intended target with a clear LOS. Using various tools such as maps, compass, binoculars, and laser rangefinders/designators, the FO relays target position information to the Fire Direction Center (FDC) to compute the range and direction to the target. The FDC then provides the field artillery unit gunners settings and adjustments to implement prior to firing.

Field artillery units are organized based on the number of guns to be employed in firing operations. The number of guns employed dictates the dimensions of the area required to occupy a FP, as there are dispersal distances between gun positions to ensure safe firing operations, and reduce vulnerability from enemy counterattacks. When an eminent threat to an established FP is identified, the field artillery unit will be ordered to displace to an alternate FP to avoid casualties and damage to equipment. Artillery displaces to provide continuous support, maintain communications, and enhance survivability.

Artillery and mortar are considered to be "indirect fire" as the gunners are unable to view the targets at which they are engaging. Other support elements such as the FO and FDC are required to assist the gunners in accomplishing their mission. The FO must take up an OP where they can observe the target to be fired upon, and relay this information to the FDC to instruct the gunners to adjust their fire as needed.

The artillery FPs on Fort Benning fire at targetry located within the K15 dudded impact area located in the northeastern portion of Fort Benning. There currently are two Observation Points that have been used to support artillery training for these FPs – Concord/ Fergusson (located directly south of K15), and the K36 Ranger Objective (located to the southeast of K15 near Cactus Range). A third OP may include the restoration of an unutilized training site known as the Hartell Bunker, which would provide an additional, operational OP to the southwest, providing additional support for the FO to direct artillery firing into the K15 dudded impact area as illustrated if Figure 2. However, there is limited visibility from all of these OPs to target locations within the southern portion of K15 hinders the FO's ability to determine adjustments to the artillery and mortar guns to hit their mark. Woody vegetation has encroached into the LOS from

all 3 of these OPs, and timber removals are needed to restore the LOS capabilities from these locations. The area identified is within southern portion of the K15 impact area and will require the aerial application of herbicides due to safety concerns from UXO contamination that prohibits ground access for removal of vegetation using other methods.

5. Description of the Proposed Action:

The proposed action is to aerially apply herbicide on up to 490 acres within K15 and approximately 32 acres downrange of Fergusson Range (522 acres total) in training compartments K36/K37 to restore LOS to the targetry located in K15 (Figure 3). Aerial application of herbicide is the preferred method to eliminate encroaching vegetation in impact areas, training areas, and range footprints where UXO precludes safe access to the areas to use other forms of mechanical removal or control of vegetation. Typically aerial herbicide applications on Fort Benning have focused on hardwood midstory/ overstory removals in order to promote longleaf pine restoration (and subsequently enhance RCW habitat), as well as to control invasive species. However, the herbicide application for the proposed action is intended to remove both the hardwood and pine overstory trees to restore LOS that's required to maintain the military training described above.

Per Department of Defense (DoD) policy, aerial application of herbicides must be approved by the Pest Management Coordinator of Army Environmental Command (AEC). This is done through the preparation and submittal of an "Aerial Spray Statement of Need" (ASSON). In accordance with Army Regulation (AR) 200-1, (*Environmental Protection and Enhancement*), an ASSON is required to include: rationale; description of the target area; pesticide information; application information; alternative methods; sensitive areas; Federal, State, and County coordination; and environmental documentation. At this time, it is unknown what herbicide(s) and application rates will be required to achieve the desired effects and Fort Benning does not have an approved ASSON to support the Proposed Action. However, at the time when these variables have been resolved, Fort Benning will prepare an ASSON for AEC review and approval, and all activities associated with the aerial application of herbicide will be conducted in accordance with the manufacturer's label, Environmental Protection Agency (EPA) guidance, Fort Benning's Integrated Natural Resources Management Plan, Fort Benning's Integrated Pest Management Plan, and all applicable Federal, States, and local laws and permitting.

Aerial application of herbicide is more time and cost efficient. Although cost per acre of UXO surveys and removals can vary considerably dependent upon the types and quantity, it significantly surpasses the cost of aerial herbicide applications costs, which can be as low as $100 per acre (dependent upon acreage to be sprayed and rate of herbicide application), vice $15,000 (or considerably more) per acre for UXOs removal even before accruing the cost of manpower for ground application of herbicides and/or timber removal operations (pers. com. Waldrep and Van Allen 2017).

Ground access to the areas proposed for aerial herbicide application is also not possible due to the lack of a trail network, as well as the density of the vegetative overgrowth which significantly limits visibility and compromises the feasibility to survey and clear the area of UXO. In addition, UXO removal would significantly impact military training since all live-fire training would cease for several months while EOD teams worked downrange. In contrast, the access trails within the K15 dudded impact area that lead to the target areas are largely void of vegetation due to the constant impact of munitions, and as such have not required a large scale application of herbicide to improve accessibility. The maintenance cycle for the K15 targetry is approximately every five to ten years dependent upon the operational training tempo (pers. com., Van Allen 2017). Maintenance activities for K15 targetry consist of UXO surveys and removals are localized to the access trails and the impact area target sites, which consist of hard targets (e.g. tank hulls and other military vehicles), that are transported with Heavy Equipment Transporters (HETs). These activities are not a component of the proposed action, as this is a semi-regular occurrence and would be considered as part of the baseline for normal range operations on an as needed basis.

In the short-term, restoration of the LOS to the K15 targetry may require more than one aerial application of herbicide. This will be dependent upon the effectiveness of the herbicide used as the target species are diverse, (e.g. pine vs. hardwoods), and the area identified is heavily vegetated. The initial herbicide application may not reach some of the understory due to overgrowth of foliage of taller vegetation, and therefore require additional applications to achieve the desired results. Long-term activities to maintain the LOS to the K15 targets may consist of additional aerial herbicide applications, but the frequency would be dictated by rates of vegetative growth, and is estimated to occur every 15 – 20 years.

All herbicide applications would take place outside of the RCW breeding season. The total application time for an aerial application for an area of 522 acres would be approximately 6 to 12 hours, depending on conditions. The actual application time spent over the K15-D cluster would be less than an hour.

6. Proximity of the Action:

Aerial application of herbicide is proposed for the southern portion of the K15 dudded impact area, located south of Shamanksi Road and Shiloh Trail, and bounded by the Digital Multi-Purpose Range Complex and Box Springs Road to the west and east respectively as illustrated in Figures 2 & 3. The application also includes approximately 32 acres downrange of Fergusson range in training compartments K36 and K37. The treatment area was determined based on ground elevations and tree heights between the OPs and the targetry using a Geographical Information System (GIS) (Figure 4).

7. Description of the Action Area:

The action area on Ft. Benning is defined by the geographic boundaries of known occupied RCW habitat described in detail within this ESMC update. The action area for the proposed aerial application of herbicide is located in the northeastern section of the Installation in the southern portion of the K15 dudded impact area and downrange of Fergusson Range in the northern extent of training compartments K36 and K37 (Figure 5). Pine Knot Creek running east to west disrupts contiguity of most overstory pine within K15 to the north of this drainage, as defined in the ESMC, to most pine dominated stands managed for RCW habitat situated to the south (Figure 6). Aerial surveys of K15 conducted in 2009 documented 4 active RCW clusters based on active tree locations identified from the air and subsequent geospatial analysis using a GIS.

Although mature pine stands have been delineated using aerial imagery, no forest inventory data exists for this impact area. Therefore, no RCW groups within K15 have ever been counted towards fulfillment of the Installation's recovery goal and any habitat that exists has never been included in a Habitat Management Unit or in the Installation's RCW habitat baseline. In addition, any habitat that may exist within the portion of the .5 mile foraging partitions of adjacent RCW clusters that overlap the K15 boundary, has never been considered or included in any foraging habitat evaluations since all forested stands within this impact area cannot be managed. Therefore, no clusters or potential forage within this compartment ever have or will be counted towards fulfillment of the Installation's RCW recovery goals. All forested areas within K15 have however, been considered serving as dispersal corridors (Figures 6 & 7).

8. Status of the Species in the Action Area:

The current status of the species within the action area are detailed in this ESMC update. Based on an aerial survey conducted in 2009, there were 4 active clusters identified in K15. One RCW cluster, K15-D, is presumed to be active and would be negatively impacted.

9. Environmental Baseline:

Current status of the species within the action area are detailed in this ESMC update.

10. Effects of the Action:

Direct effects. An estimated 125 acres of contiguous and 11 acres of noncontiguous pine dominated habitat (based on aerial delineations) within .5 miles of the K15-D cluster center would be taken (Figures 7 & 8). Based on the 2009 aerial survey, 2 inactive cavity trees (relics) to the north of RCW cluster K15-D, 1 inactive cavity tree (enlarged), 1 active start tree, and 3 active cavity trees within the K15-D cluster would be taken (Table 1) (Figure 9). Since the majority of contiguous pine dominated pine habitat associated with RCW K15-D cluster would be taken as a result of the proposed action, it would therefore not be expected to persist on the landscape.

Table 1. Status of all RCW cavity trees in cluster K15-D as observed in the 2009 aerial survey. Cavity trees highlighted in yellow would be taken by the proposed action.

ID	Cluster	Species	Activity	Stage	Cavity	Notes
0	K15-D	LOBLOLLY	POSSIBLY ACTIVE	CAVITY	ENLARGED	
1	K15-D	LOBLOLLY	ACTIVE	CAVITY	NORMAL	
2	K15-D	LOBLOLLY	ACTIVE	CAVITY	NORMAL	
3	K15-D	LOBLOLLY	INACTIVE	CAVITY	ENLARGED	
4	K15-D	LOBLOLLY	ACTIVE	CAVITY	NORMAL	
5	K15-D	LOBLOLLY	ACTIVE	START	NORMAL	
6	K15-D	LOBLOLLY	ACTIVE	CAVITY	NORMAL	
13	N/A	LOBLOLLY	INACTIVE	CAVITY	RELIC	
14	N/A	LONGLEAF	INACTIVE	CAVITY	RELIC	FIRE DAMAGE
16	K15-D	LOBLOLLY	ACTIVE	CAVITY	NORMAL	

The proposed action would also remove approximately 0.06 acres of suitable habitat from the foraging partition of cluster K37-A and 1.57 acres of suitable and 4.3 acres of unsuitable habitat from the foraging partition of cluster K36-A (Figure 10). Post-project foraging partition values that were calculated using the Fort Benning Standard for Managed Stability for RCW cluster K36-A indicated that 5,977.65 BA^2 of $\geq$10" pine on 120.78 acres (Table 2) and 5,117.12 BA^2 of $\geq$10" pine on 110.42 acres for cluster K37-A would remain (Table 3).

In addition, unmanageable overstory pine removal that is within the .5 mile foraging partitions of adjacent RCW clusters located outside of K15 that falls within the K15 impact area boundary include: approximately 8.3 acres for cluster K36-A, 1.1 acres for K37-A , and 2.6 acres for cluster K27-C (Figure 8). However, since all forested stands within this impact area are inaccessible and cannot be managed, no forest stand inventory data exists and have never been considered or included in any foraging habitat analyses for previous projects.

Indirect effects. The northwestern boundary of the proposed treatment area is approximately 1 mile from the cluster center of K15-A. The nearest cluster center distances measured from surrounding clusters to K15-D include: 2.0 miles from K15-A to the northwest, 1.08 miles from K36-A and 1.3 miles from K37-A to the southwest, 1.45 miles from K35-C, 0.84 miles from K27-C to the northeast, and 1.2 miles from K28-C to the southeast. Since all K15 impact area clusters have been covered under an incidental take statement since 2002 and no management or monitoring is possible, all neighborhood analyses for any previous projects have never included or considered any of the K15 clusters as part of the analyses.

Of the 522 acres in the proposed action to aerially spray with herbicide, a total of approximately 272 acres are identified as unmanageable overstory pine that would be removed from the southern portion of K15 (Figure 11). Not all of this overstory pine is

contiguous, however the potential exists for some disruption to RCW dispersal patterns east to west in the southern portion of this impact area.

11. Conclusion and Determination of Effects:

The principal objective of this action is to amend the current incidental take statement for RCW cluster K15-D to include maintenance activities that would allow restoration of LOS between the observation points located outside the boundary of K15 to the targetry located within, for the purpose of maintaining large caliber weapon systems, live-fire military training capability. This maintenance activity would be in the form of an aerial herbicide application(s) that would over time remove most of the contiguous, unmanageable pine overstory associated with cluster K15-D within the K15 dudded impact area, as well as 3 active cavity trees and 1 active start tree. Although 2 active and 1 inactive cavity trees would remain, as well as a small buffer of overstory pine adjacent to overstory hardwood that will be left intact as a streamside buffered area, the cluster would not be expected to persist on the landscape.

Since the large drainage associated with Pine Knott Creek already serves as a natural impediment to north-south movement by RCWs in clusters located approximately .5 miles to the south of the K15 boundary, the proposed action would not be expected to significantly change RCW dispersal patterns in this direction. Although contiguous overstory pine on the north side of this drainage currently does not fully connect the eastern boundary of K15 to the western boundary, it would be reasonable to assume that east-west movement by RCWs in this southern area would be impeded to some degree by removal of most of the overstory pine. However, of the 2,609 acres of unmanageable overstory pine identified in K15, 2,339 acres would remain post-action where contiguity between those stands currently exists and would continue serving as travel corridors for RCWs (Figures 5 & 7).

The Army determines that the proposed action is likely to adversely affect RCW cluster K15-D. Since this RCW cluster is already covered under an incidental take statement, amending the allowable actions to the existing incidental take statement will not change any of the population numbers reported in this ESMC Update.

The Army also determines that individual activities identified in the ESMC update may effect, but is not likely to adversely affect the RCW on Fort Benning, implementation of the proposed ESMC Update as a whole results in an overall “Beneficial Effect” in direct support of recovery for the Fort Benning RCW population.

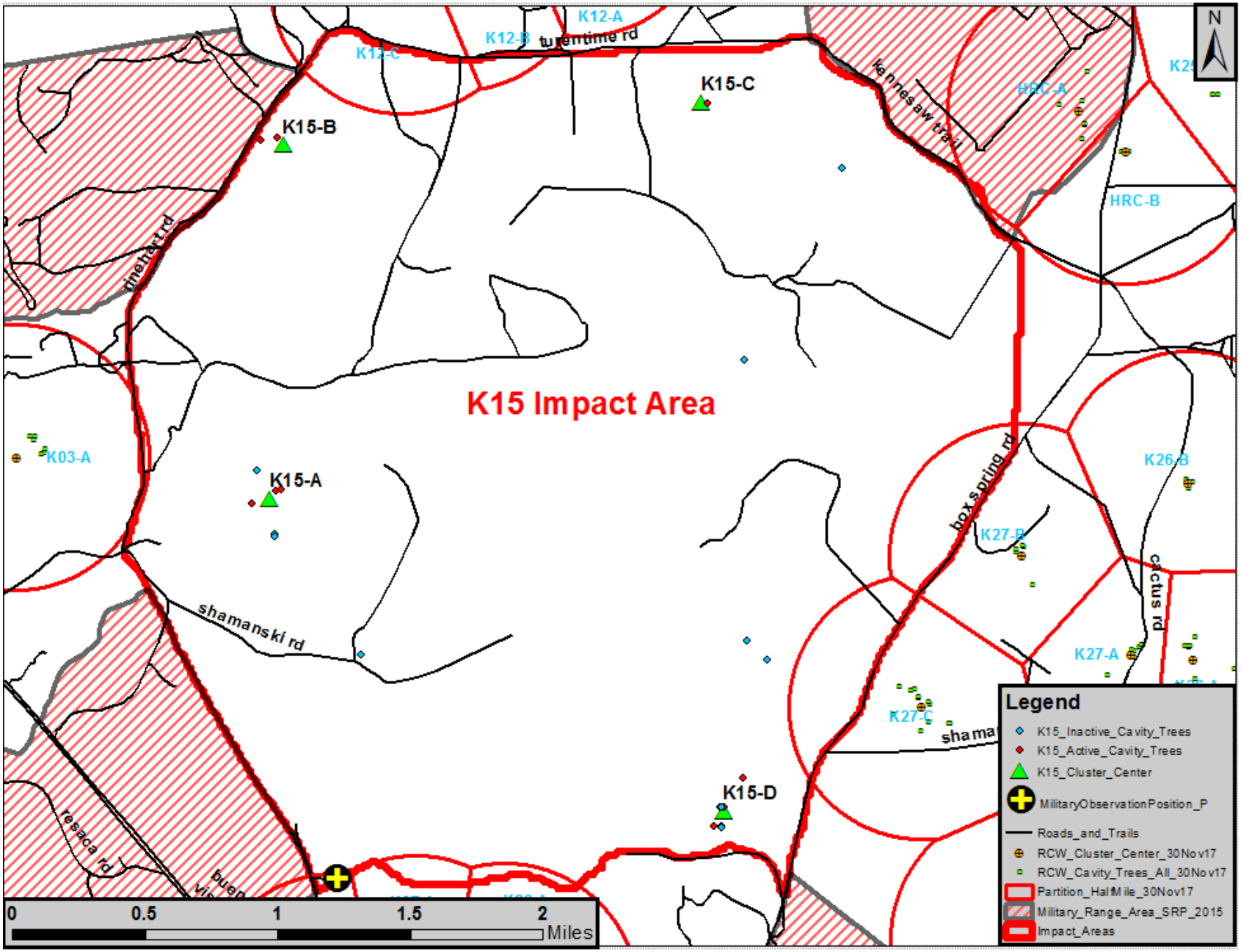

Figure 1. RCW cluster assignment in the K15 dudded impact area based on geospatial analysis using active/inactive tree locations identified from aerial surveys conducted in 2009.

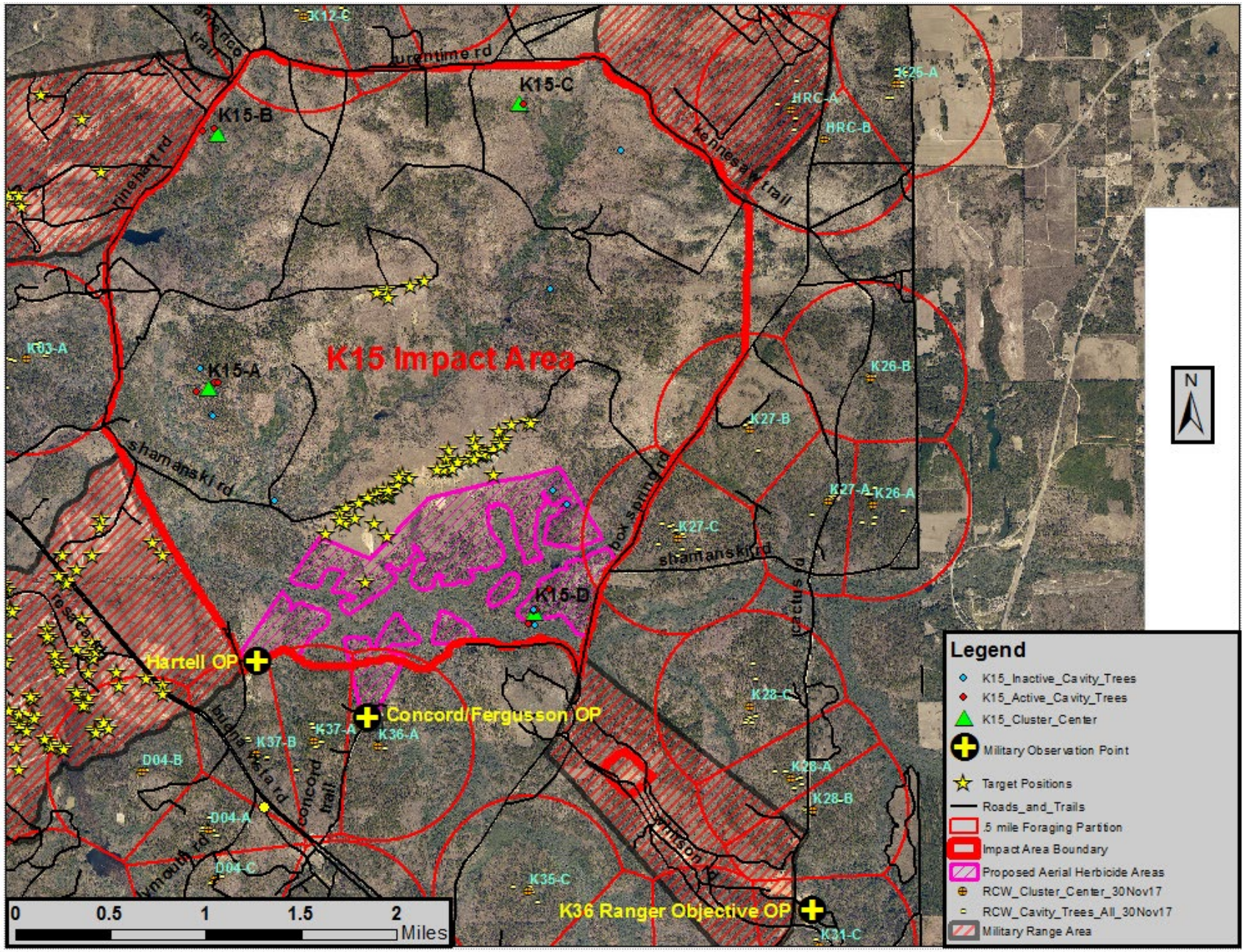

Figure 2. Location of Observation Points, K15 targetry, and proposed herbicide application areas to restore Line of Sight capability as of June 2018.

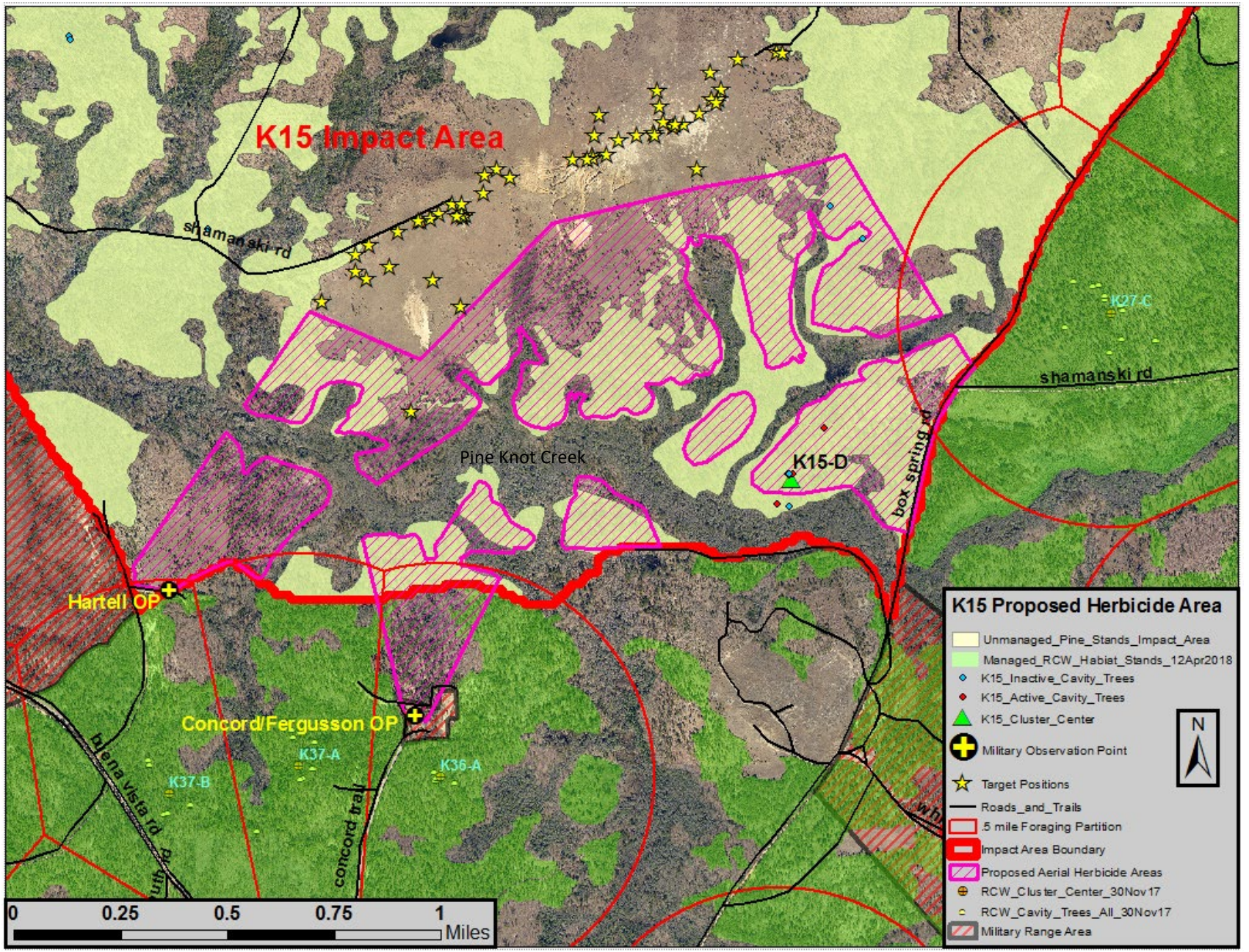

Figure 3. Proposed boundary representing the maximum extent of vegetation removal with aerial herbicide (approximately 530 total acres) to restore Line of Site to K15 targetry from the 3 Observation Points as of June 2018.

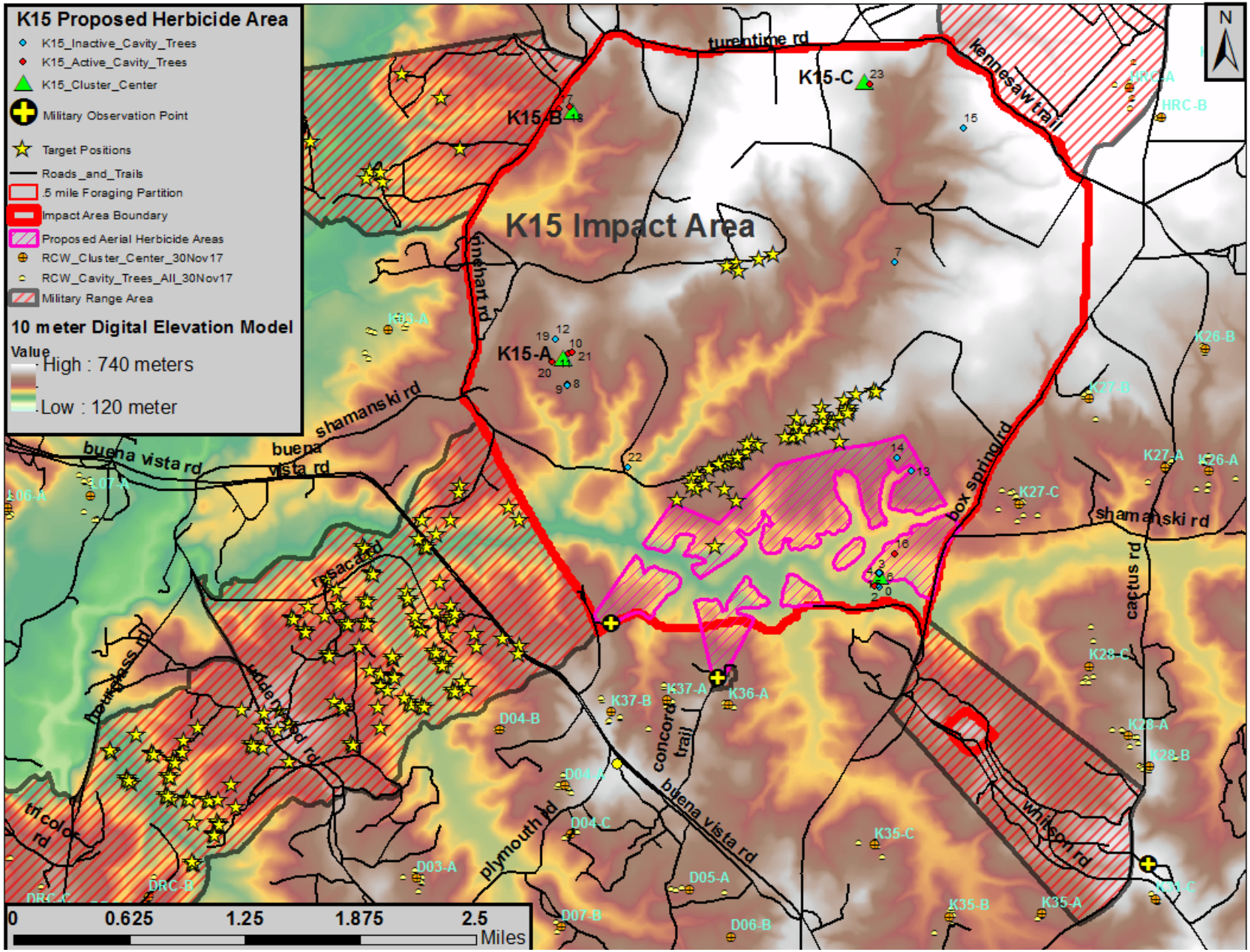

Figure 4. Digital Elevation Model with 10 meter resolution of the proposed herbicide area relative to the K15 targetry and observation points as of June 2018.

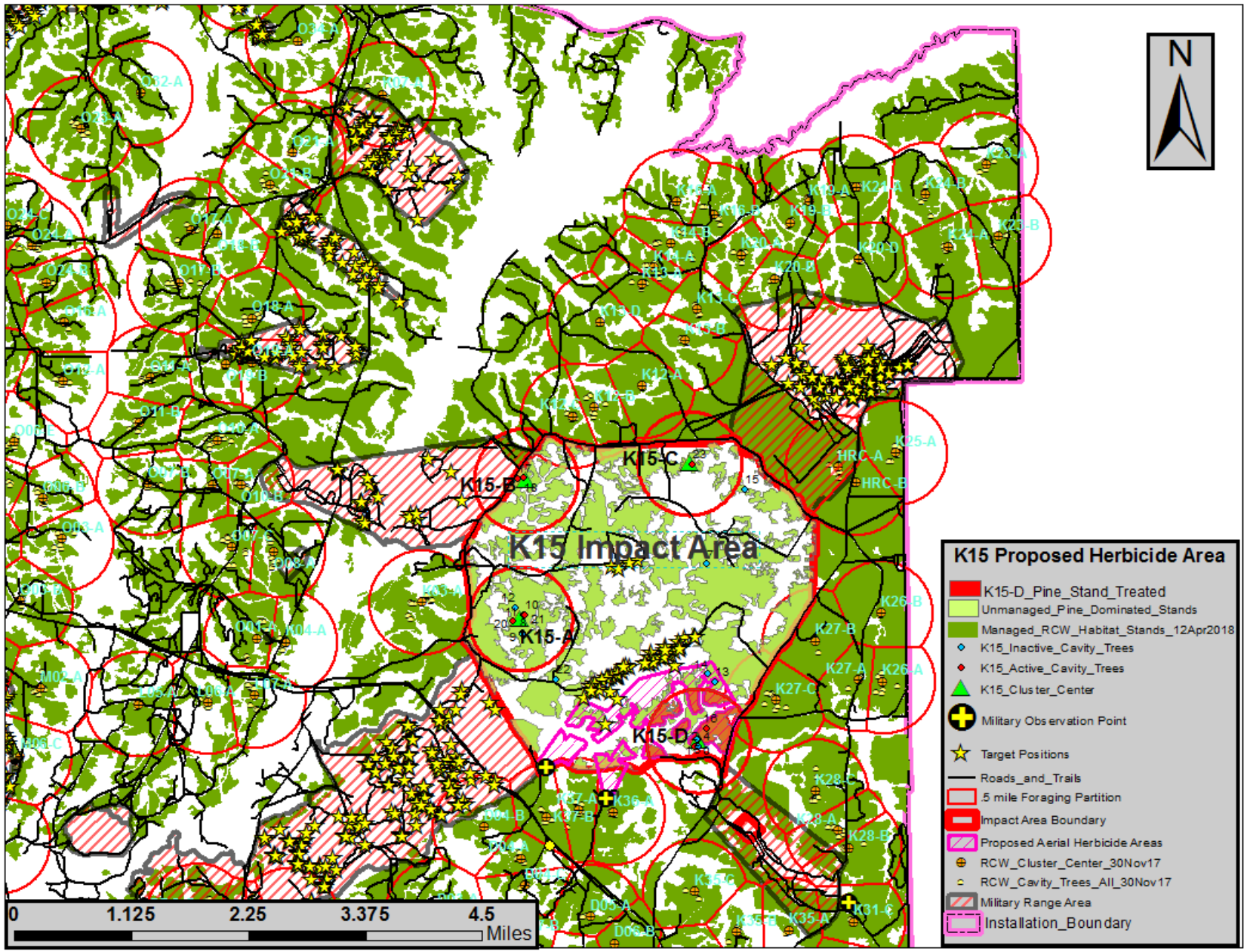

Figure 5. The K15 dudded impact area is located in the northeastern section of Fort Benning (June 2018)..

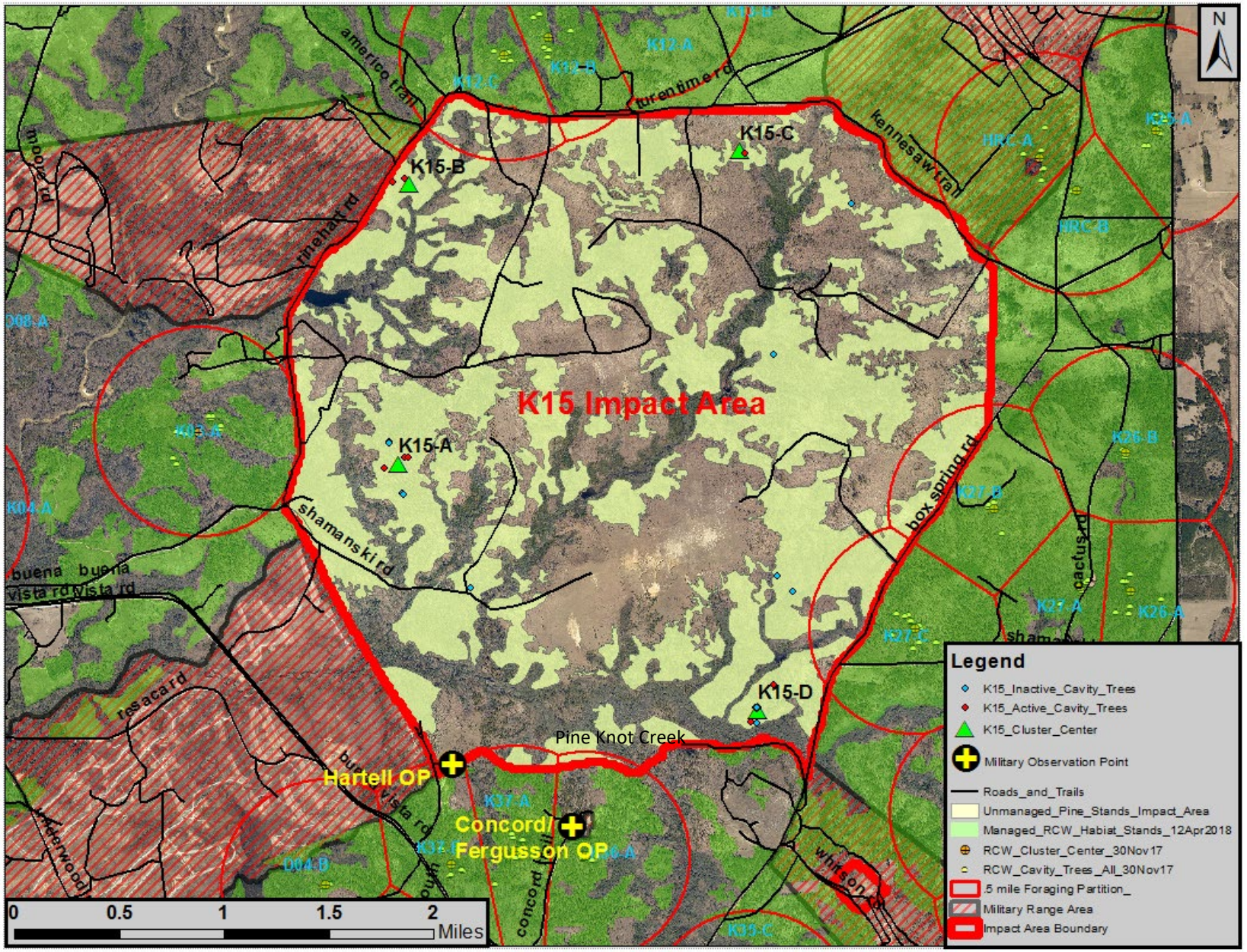

Figure 6. Unmanaged pine stands as of June 2018 within K15 delineated from aerial imagery. The Pine Knott Creek drainage disrupts the contiguity of most unmanaged overstory pine stands within K15 to managed pine stands situated to the south.

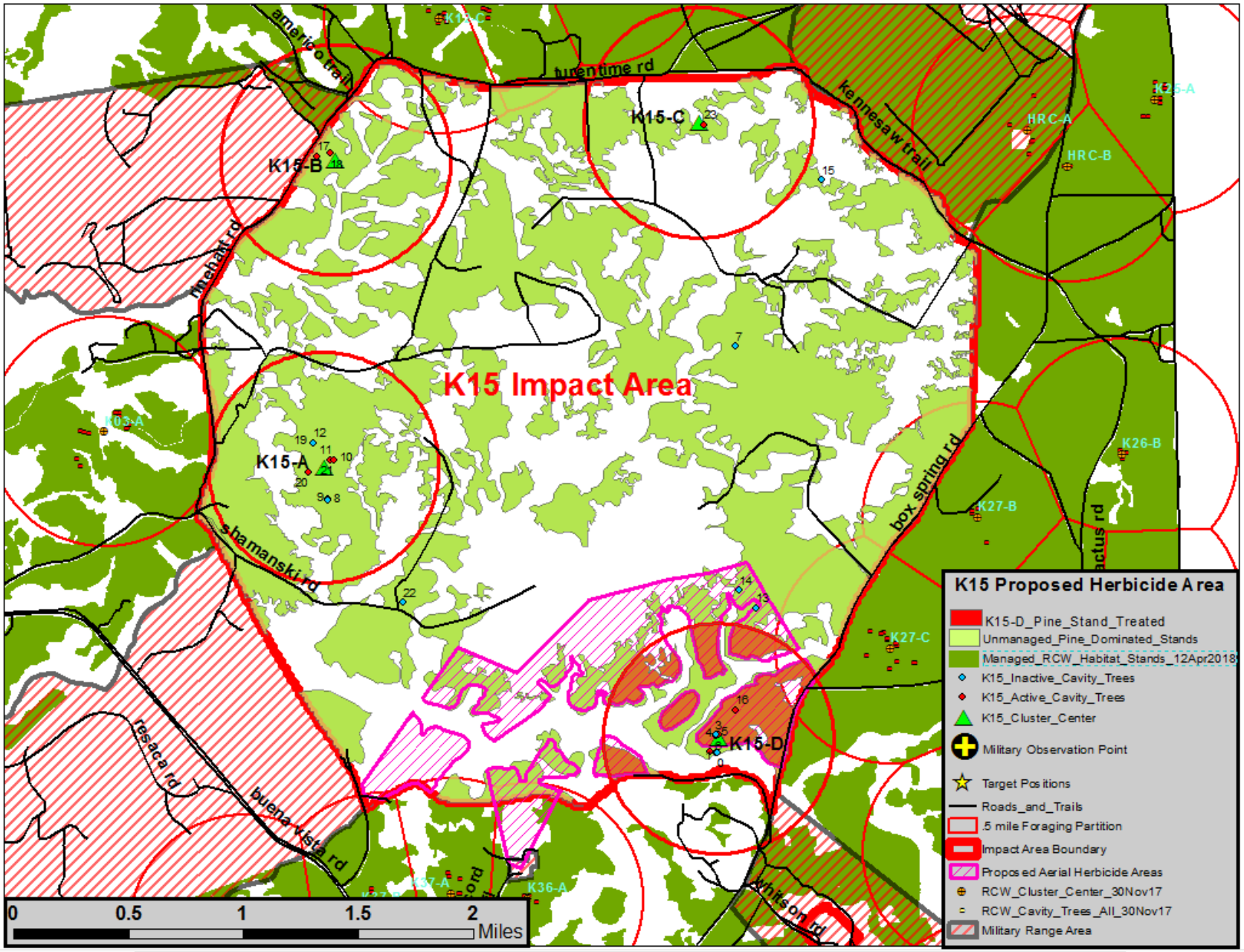

Figure 7. Unmanageable pine dominated stands within .5 miles of the K15-D cluster center that will be removed through chemical treatment (June 2018).

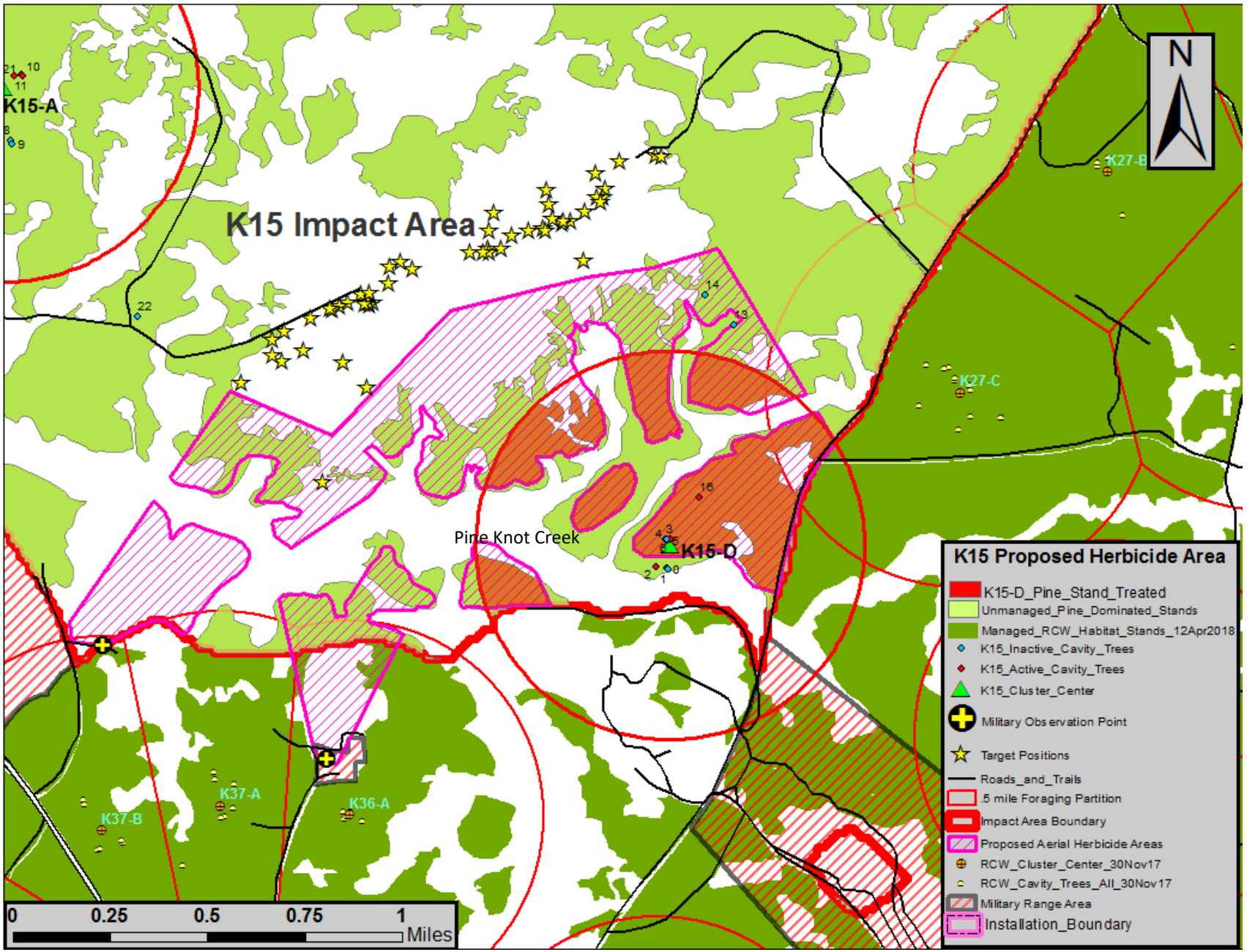

Figure 8. Unmanaged pine removal from the K15-D foraging partition estimated to be 130 acres (June 2018).

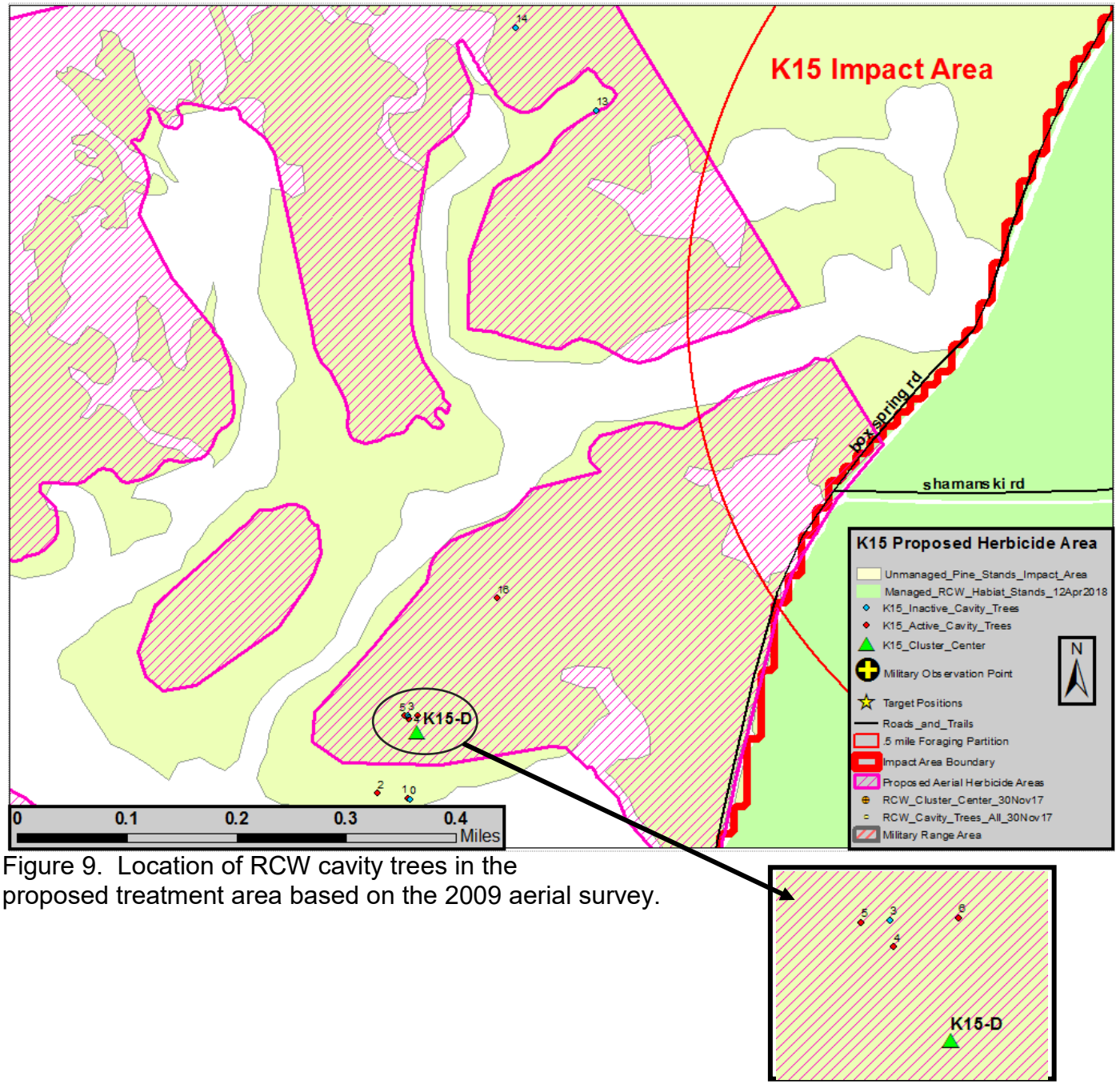

Figure 9. Location of RCW cavity trees in the proposed treatment area based on the 2009 aerial survey.

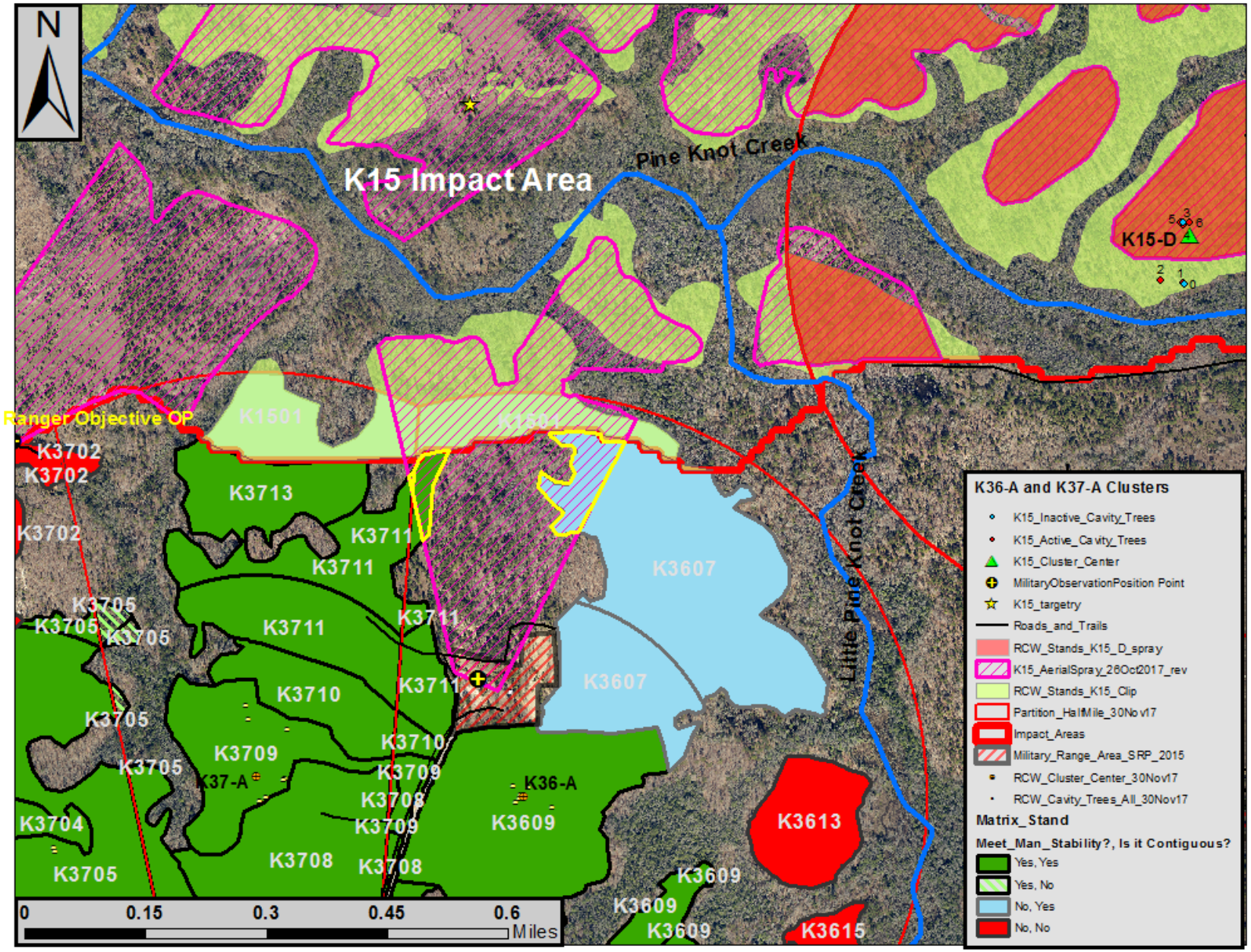

Figure 10. The proposed treatment area will remove approximately 0.06 acres of suitable habitat from the foraging partition of cluster K37-A and 1.57 acres of suitable and 4.3 acres of unsuitable habitat from the foraging partition of K36-A (June 2018).

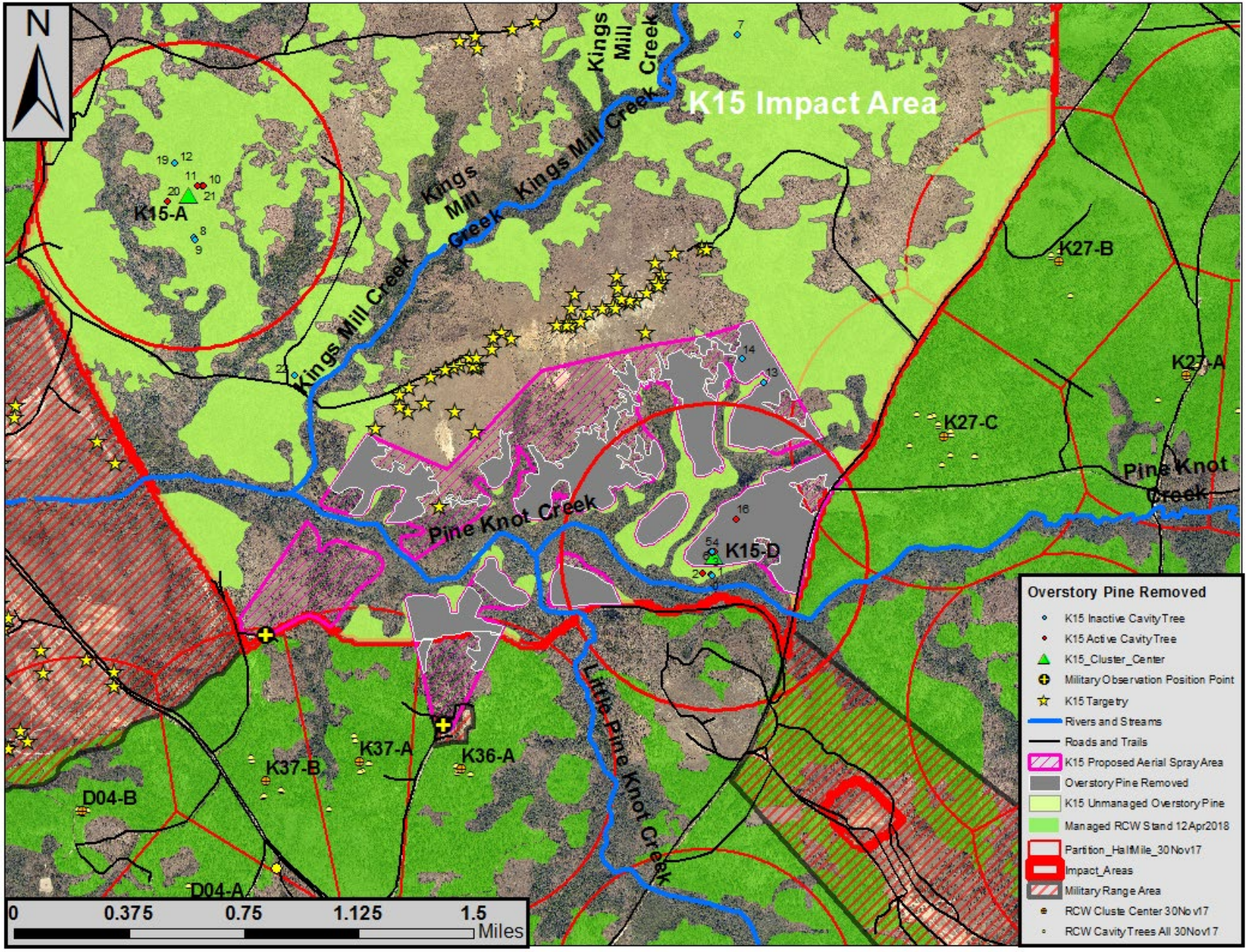

Figure 11. Unmanaged overstory pine in K15 that would be removed, relative to the Pine Knott Creek drainage, surrounding overstory pine in K15, and managed RCW pine habitat boarding K15 as of June 2018.

Table 2. Post-project foraging partition values of RCW cluster K36-A.

Partition K36-A - Partition Values (MS)

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Total size of Partition (acres)	355.98	**Total Acres Forage Habitat 1/4-Mile***	60.09
Total Pine BA (sq feet) Pines > 10"	5,977.65	**Contiguous Foraging Acres***	120.78
Total Acres Forage Habitat	120.78	**Meets Mananaged Stability**	Yes

= Recommended

***Note: The Partition only needs to meet the requirements of the required categories to meet Managed Stability so it is possible to fail the recommended categories and still pass for Managed Stability.**

Partition K36-A - Stand Values (MS)

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Stand ID	Age	PBA >10	PBA <10	Hdwd Midstory	Total BA	*% Groundcover**	*Burn Interval**	*Burn Season**	Total Acres
K1501	89.00	0.00	0.00	0.00	0.00	0.00	0	0	9.61
K3607	85.00	37.00	3.90	7.00	45.10	22.00	3	1	56.04
K3609	85.00	50.20	3.60	1.00	50.80	21.00	3	1	63.99
K3610	85.00	48.90	3.90	1.00	50.10	23.00	3	1	28.32
K3613	13.00	0.00	0.00	0.00	0.00	0.00	3	1	11.42
K3614	64.00	49.20	6.40	1.00	50.20	26.00	3	1	19.11
K3615	13.00	0.00	0.00	0.00	0.00	0.00	3	1	4.97
K3708	96.00	45.00	7.50	2.00	49.00	17.00	3	1	0.91
K3709	102.00	67.50	6.50	1.00	71.50	26.00	3	1	2.05
K3710	102.00	67.50	6.50	1.00	71.50	26.00	3	1	1.36
K3711	57.00	33.50	6.00	1.00	43.50	18.00	3	1	5.02

= Recommended Categories

***Note: The Stand only needs to meet the requirements of the required categories to meet Managed Stability so it is possible to fail the recommended categories and still pass for Managed Stability.**

Table 3. Post-project foraging partition values of RCW cluster K37-A.

Partition K37-A - Partition Values (MS)

6/18/2018
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Total size of Partition (acres)	202.30	**Total Acres Forage Habitat 1/4-Mile***	75.74
Total Pine BA (sq feet) Pines > 10" dbh	5,117.12	**Contiguous Foraging Acres***	108.57
Total Acres Forage Habitat	110.42	**Meets Mananaged Stability**	Yes

**** = Recommended Categories***

Partition K37-A - Stand Values (MS)

6/18/2018
3:36:25 PM

Stand ID	Age	PBA >10	PBA <10	Hdwd Midstory	Total BA	*% Groundcover**	*Burn Interval**	*Burn Season**	Total Acres
K1501	89.00	0.00	0.00	0.00	0.00	0.00	0	0	11.15
K3614	64.00	49.20	6.40	1.00	50.20	26.00	3	1	2.07
K3702	14.00	0.00	0.00	0.00	0.00	0.00	3	1	0.87
K3705	88.00	42.20	7.80	1.00	46.60	31.00	3	1	6.19
K3707	95.00	14.00	4.50	2.00	28.50	12.00	3	1	31.72
K3708	96.00	45.00	7.50	2.00	49.00	17.00	3	1	35.35
K3709	102.00	67.50	6.50	1.00	71.50	26.00	3	1	16.78
K3710	102.00	67.50	6.50	1.00	71.50	26.00	3	1	10.43
K3711	57.00	33.50	6.00	1.00	43.50	18.00	3	1	27.02
K3713	57.00	33.50	6.00	1.00	43.50	18.00	3	1	12.58

**** = Recommended Categories***

***Note: The Stand only needs to meet the requirements of the required categories to meet Managed Stability so it is possible to fail the recommended categories and still pass for Managed Stability.**

APPENDIX C

2018 RCW ESMC UPDATE

BIOLOGICAL OPINION

Biological Opinion

2018 Annual Update of Fort Benning Army Installation's Endangered Species Management Component for the Red-Cockaded Woodpecker (*Picoides borealis*)

FWS Log #: 2018-F-2360

Prepared by:

U.S. Fish and Wildlife Service
Georgia Ecological Services
West Georgia Sub-Office
1st Division Road & Highway 27
Fort Benning, Georgia, 31995

Donald W. , Project Leader — September 26, 2018

[NAME, TITLE] — Date

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CONSULTATION HISTORY

This section lists key events and correspondence during the course of this consultation. A complete administrative record of this consultation is on file in the U.S. Fish and Wildlife Service's West Georgia, Ecological Services Sub-Office.

March 02 thru March 29, 2018

- Fort Benning (Ft. Benning/Installation) provided the U.S. Fish and Wildlife Service (Service) with a Draft of their 2018 Annual Update of the Fort Benning Army Installation's Endangered Species Management Component for the Red-Cockaded Woodpecker (2018 Update), including appendices (19 appendices in total).
- The Installation sent the Service Appendix 5 separately to highlight corrections in their red-cockaded woodpecker (RCW) cluster datasets and to inform the Service of the Installation's future plans for protecting and unprotecting RCW clusters.
- Ft. Benning provided the Service with an update of Appendix 6 which defined and summarized the Installation's proposed Action. The 2018 Update also defines two Action components (Action component 1- is an aerial herbicide treatment proposed in the Kilo 15 (K15) Impact Area), and (Action component 2- is fire management/fire effects which incorporates the entire Installation).
- The Service sent Ft. Benning its comments concerning the Appendix 6 draft, to include a request for further clarification regarding their incidental take request (March 19, 2018 email).
- Ft. Benning sent a written response back to the Service on March 29 2018, clarifying the Appendix 6 proposal(s).

April 10 thru April 18, 2018

- On April 10, 2018, the Service informed Ft. Benning that formal consultation would be required and a formal request letter would be needed from the Installation in order to initiate and define the consultation process timeline.
- Ft. Benning requested a meeting to discuss the aerial herbicide treatment for K15. As proposed, the aerial herbicide treatment would adversely impact RCW cluster K15-D.
- The Installation provided the Service with a revised draft proposal, along with an Excel spreadsheet that summarized the updates for all 19 Appendices supporting the 2018 Update.

May 23 thru May 29, 2018

- May 23, 2018, the Installation provided the Service with a proposal to explore whether informal consultation would suffice for Endangered Species Act (ESA) compliance on the proposed action.
- May 24, 2018, the Service informed Ft. Benning that their informal consultation proposal was submitted to several Service experts within Region 4 for vetting.
- Service concluded that formal consultation would be required.

- May 29, 2018, the Service responded back to the Installation suggesting that formal consultation is appropriate if the Action and Action components are submitted as proposed.

June 04 thru June 25, 2018

- Service requested an update on the Installation's status regarding the 2018 Update.
- The Installation informed the Service that the 2018 Update was moving through the Installation's Command for review.

July 9, 2018

- Service provided the Installation with a letter (**FWS Log #**: 2018-F-2360) to initiate formal consultation. The Service letter acknowledged the receipt of Ft. Benning's letter to formally consult, recognized the proposed Action and Action Components, and provided the Installation with the consultation closing date of November 21, 2018.

August 1, 2018

- After discussions between the Service and Ft. Benning, the Service received an amended consultation initiation letter with a revised action affects determination. The amendment was specific to the fire management/fire effects action component, specifically regarding the potential adverse effects that may occur to RCW cavity trees during extreme drought conditions. The Installation's initial conclusion of may affect, not likely to adversely affect, was amended to a may affect, likely to adversely affect determination. The Service reported to the Installation that may affect, likely to adversely affect is the standard determination when incidental take is requested for a proposed action.

BIOLOGICAL OPINION

1. INTRODUCTION

A biological opinion (BO) is the document that states the opinion of the U.S. Fish and Wildlife Service (Service) under the Endangered Species Act of 1973, as amended (ESA), as to whether a Federal action is likely to:

- jeopardize the continued existence of species listed as endangered or threatened; or
- result in the destruction or adverse modification of designated critical habitat.

The Federal action addressed in this BO is the Fort Benning Army Installation (Ft. Benning/Installation) proposed "2018 Annual Update of Fort Benning's Army Installation's Endangered Species Management Component for the Red-Cockaded Woodpecker" (2018 Update). This BO considers the effects of the Action on red-cockaded woodpeckers (RCW). The Action does not affect designated critical habitat; therefore, this BO does not further address critical habitat.

This BO uses hierarchical numeric section headings. Primary (level-1) sections are labeled sequentially with a single digit (e.g., 2. PROPOSED ACTION). Secondary (level-2) sections within each primary section are labeled with two digits (e.g., 2.1. Action Area), and so on for level-3 sections (as needed).

2. PROPOSED ACTION

The essential applications needed to implement Ft. Benning's Integrated Natural Resources Management Plan (INRMP) and subsequently, this 2018 Update (Action) which directly supports the INRMP, are actions that strive to attain the Installation's RCW recovery goals. These management activities include but are not limited to: (1) application and control of fire as a means to further develop the desired future condition for the Installation's pine/grass systems, which at a minimum, supports both RCW clusters and foraging habitat, (2) protection and development of large, mature longleaf pines throughout the landscape, (3) protection and maintenance of existing RCW cavities and judicious provisioning of artificial cavities to ensure all clusters maintain a minimum of 4 suitable cavities, (4) restoration and maintenance of sufficient habitat quality and quantity to support the RCW population necessary for recovery on Ft. Benning, (5) limited provisioning of sufficient recruitment clusters in locations chosen to enhance the spatial arrangement of groups, and (5) continued monitoring of those clusters still covered by incidental take authorizations to validate persistence and reproductive health so they can again count towards the Installation's population recovery goal of 351 Potential Breeding Groups (PBG(s)).

To achieve these management goals, Ft. Benning will (1) conduct prescribed burns on all suitable, potentially suitable, and future recovery habitat every 1 to 3 years, with burns predominantly conducted during the growing season, (2) manage forest ecosystems to improve RCW habitat using commercial timber harvest (i.e. thinning), hardwood control, conservation and regeneration of longleaf pine, and other ecosystem management practices that will benefit the RCW, (3) enhance existing RCW clusters by provisioning artificial cavities in cavity-limited sites to ensure a minimum of 4 suitable cavities are available, (4) use management techniques such as translocation and augmentation to increase the RCW populations on- and off-post, (5) protect Protected Clusters (PC) and prevent Unprotected Clusters (UC) from damage or disturbance by education and proactive planning via Ft. Benning's National Environmental Policy Act (NEPA) process, PC boundary marking, and periodic cluster inspections, (6) maintain and improve environmental awareness of all personnel at Ft. Benning with respect to protection of the RCW, (7) monitor RCW population status/trends for both PCs and UCs and make necessary adjustments as required, (8) identify recruitment cluster locations to achieve an RCW population density of approximately one cluster per 150 acres of suitable habitat. The foraging habitat for each cluster should contain at least 3000 ft2 Basal Area (BA2) of pines > 10 inches diameter at breast height (DBH) and meet the Ft. Benning Standard for Managed Stability (FBSMS) with the goal of managing for the RCW Recovery Standard (RS), and (9) conduct habitat improvements that facilitates both natural and artificial recruitment of new clusters.

Although the implementation of the management actions and goals listed above are recognized by both the Installation and the Service as being beneficial for RCWs in the long-term,

Ft. Benning has determined some short-term adverse impacts may occur when implementing this 2018 Update. As such, the Installation proposes to amend their INRMP/RCW ESMC actions. In the 2014 ESMC BO, the Installation was afforded incidental take for four RCW clusters/groups located in the southeastern corner of training compartment K15. For this 2018 Update however, the Installation will need to conduct new, required maintenance and management activities that are necessary to restore line-of-site (LOS) to the targetry located in the center of K15. This action component is needed in order to maintain military mission capability. The restoration of LOS requires removal of overstory hardwood and pine trees by an aerial application of herbicide within an area of up to 530 acres and will adversely impact one of the previously taken RCW clusters (i.e., RCW cluster, K15-D).

The Installation's 2018 Updated proposal also includes a second action component which seeks to modify the parent RCW INRMP/ESMC incidental take authorization to include additional coverage for RCW cavity trees that are potentially vulnerable to undesirable fire management/fire effects (e.g., inadvertent, adverse effects to RCW cavity trees resulting from fire, specifically vulnerable during drought conditions).

The 2018 Update also included several requests by the Installation for incidental take authorizations to continue from the previous ESMC. Specific requests include:

Incidental take for trees in manageable (accessible) clusters in the A20 Impact Area for the remainder of the life of this ESMC (20 November 2019) due to the reasonable certainty for errant explosive munitions fired into this impact area, the Installation was afforded up to 2 clusters or a total of 8 active cavity trees, in the form of harm. The Service required that mortality should not exceed the allotment, and no loss of groups due to fire management was anticipated.

The Installation requests incidental take coverage to continue for up to 3 RCW clusters and a total of 12 active cavity trees through the remaining 5-year life of this RCW Updated ESMC (20 November 2019) for RCWs that may bud or pioneer into habitat situated downrange of live-fire areas, within HMU-1, and outside of the A20 Impact Area, where incidental take is not anticipated, but is reasonably certain to occur.

Although no takes are anticipated, the Installation requests to continue incidental take coverage for the 15 RCW groups that were previously designated Supplemental Recruitment Clusters, which were converted to Unprotected Clusters (USFWS 2014a). The Service requests that Fort Benning continue to count these groups towards its population recovery goal as provided under the 2007 RCW Guidelines.

Finally, Ft. Benning reported that they want to continue to abide by the incidental take statement that is issued by the Service for the required Federal banding permit for all demographic monitoring and translocation activities for RCWs on the Installation. This permit is renewed every 3 years or as necessary due to personnel changes. Ft. Benning will continue to abide by the terms and conditions of all previously issued incidental takes authorizations still covered under existing BOs described above.

Generally, incidental take authorizations remain in effect until the take(s) occur. Therefore, asking for the continuation of authorized takes that have yet to occur are actions that have no effect on the species. Therefore, this BO will not further address these components.

2.1. Action Area

For purposes of consultation under ESA §7, the action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR §402.02). The "Action Area" for this consultation includes all of the Installation; including the Army Compatible Use Buffer (ACUB) 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 2003).

For this BO, dispersal distance was defined as the average distance Ft. 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 (USACE 2008). Ft. Benning RCW dispersal data collected over 11 years was analyzed by Ft. Benning biologists and revealed an average dispersal distance of 2.57 miles (USACE 2008). This distance buffer was applied to all active RCW clusters impacted by the proposed action. In total, the Action Area, including the Installation and affected adjacent lands is 216,748 acres. 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, Georgia.

2.2. Aerial Herbicide Treatment (Action component 1)

The aerial herbicide Action component expects to treat up to 490 acres of timber within the K15 Impact Area and approximately 32 acres downrange of Fergusson Range (522 acres total) in training compartments K36/K37 to restore LOS to the targetry located in K15. As described by the Installation, this herbicide treatment was not specific on which chemical(s) would be used to accomplish the desired outcome, and subsequently, the rates and concentrations of application are unknown at the time of composing this BO. In their assessment (2018 Update) however, the Installation reports that the details for the chemical application would be conveyed and submitted for approval by the Service prior to implementation.

2.3. Fire Management/Fire Effects (Action component 2)

Generally, fire management/fire effects are used by the Installation to improve upland pine/grass habitat conditions, reduce the establishment of invasive species, and reduce insect pests. Also, wildfire risk is reduced by reduction in fuel loads, and visibility for military ground maneuvers is improved by reducing vegetative midstory components. Growing season burns are conducted

where needed for specific habitat restoration purposes, and timing of these burns is based on weather, air quality considerations, fuel conditions, etc.

The Installation reports that prescribed burning is an area source of criteria pollutant emissions on the Installation. Whereas wildfires are unplanned events and the smoke generated cannot be managed for reduced impacts to smoke sensitive areas, prescribed fires reduce the potential for destructive wildfires and contribute to the maintenance of long-term air quality as acknowledged in the Environmental Protection Agencies (EPA) Interim Air Quality Policy on Wildlands and Prescribed Fires. This policy also recognizes that prescribed fires are an irreplaceable management tool in the process of maintaining biological diversity and balance within fire-dependent natural communities. Furthermore, the EPA policy is that land managers should coordinate with state air quality managers to "allow fire to function in its natural role in wildlands" while "protecting public health and welfare by minimizing smoke impacts" (U.S. Environmental Protection Agency, 1998).

In this setting, Ft. Benning is required to burn 90,000 acres of pine habitat every three years for RCW habitat management (U.S. Fish and Wildlife Service, 2002). The Installation's goal is to burn 30,000 acres per year while minimizing impacts to the training mission. Fort Benning's Integrated Wildland Fire Management Plan (see 2001 INRMP) states its primary purpose is to ensure that fire management program areas and military activities on Ft. Benning are integrated and consistent with federal stewardship requirements. The Georgia and Alabama Forestry Commissions administer each state's Smoke Management Plans. With cooperation from federal land managers these plans address procedures to manage smoke and achieve national clean air objectives while improving the quality of wildland ecosystems through the use of prescribed fire.

2.4. Interrelated and Interdependent Actions

A BO evaluates the effects of a proposed Federal action. For purposes of consultation under ESA §7, the effects of a Federal action on listed species or critical habitat include the direct and indirect effects of the action, plus the effects of interrelated or interdependent actions. "Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR §402.02). In its request for consultation, the Installation did not describe, and the Service is not aware of, any interrelated or interdependent actions associated with the proposed Action. Therefore, this BO does not further address the topic of interrelated or interdependent actions.

2.5. Summary of the Proposed Action

The Installation described in its 2018 Update, that the proposed Action is the implementation of the 2018 Update. Nested within the proposed Action, the Service recognizes two Action components that triggered the need for formal consultation;

- Action component 1: The Kilo Impact/Training Area - Aerial Herbicide Treatment, and
- Action component 2: The Installation's Fire Management/Fire Effects procedures.

Action component 1 will eliminate roughly 522 acres of timber that is delineated as pine, pine/hardwood and supports RCWs. Action component 2 includes roughly 216,748 acres of land (AA includes lands outside the Installation boundaries, including ACUB tracts), and supports a Primary Core RCW Recovery Population. The Action and the Action components are generally applied throughout the year, although most management activities have seasonal timeframes. Action component 1 - aerial chemical treatment is proposed for implementation in November 2018, and Action component 2 - fire management/fire effects generally occurs year round and has significant risk vulnerabilities, particularly during extreme drought conditions (2018 Update).

3. STATUS OF SPECIES

This section summarizes best available data about the biology and current condition of RCWs throughout its range that is relevant to formulating an opinion about the Action. The Service published its decision to list RCWs as endangered on October 13, 1970 (35 FR 16047).

3.1. Species Description of Red-cockaded Woodpeckers

The RCW is a medium-sized woodpecker that feeds primarily on insects in mature pine stands and nests in mature, live pine trees that have decaying heartwood. It is easily distinguished from other similar woodpeckers by its white cheek patch. The males have a tiny red tuft of feathers or "cockade" on both sides of the head, from which the common name was derived. Vocalizations of the RCW are a rough, rasping *sripp* or *zhlip* and sometimes a higher *tsick*.

3.2 Life History of Red-cockaded Woodpeckers

The RCW has been federally and state listed as endangered due to population declines (35 *FR* 16047). Various publications provide more technical descriptions of the species (Ligon 1970, Crosby 1971 and Jackson 1971). The main reason for their historic decline is the loss and conversion of mature pine forests throughout the southeast. Logging, fire suppression, pine beetles and various diseases are the leading causes of habitat loss. Without the appropriate population and habitat management on Federal, state and private lands, the RCW would once again be declining.
The RCW occurs primarily in pine and pine-hardwood forests of the piedmont and coastal plain of 11 southeastern states.

These pine-dominated forests used by the RCW are fire dependent ecosystems. Current thought, supported by various research among fire ecologists, is that periodic fires caused by lightning strikes during the growing season shaped these pine systems and that the removal of growing season fire will lead to dominance by non-fire dependent plant communities. The RCW is habitat-specific in that it requires mature pine trees that have decaying heartwood for nesting and roosting. The RCW also prefers stands that are open with little or no midstory. Its diet consists primarily of insects and small arthropods, but it also consumes some fruits and soft mast. The territory size of an RCW depends upon foraging habitat quality and population density, and typically ranges between 75 and 250 acres. In Georgia, the RCW was present in 35 counties in the Coastal Plain and Piedmont physiographic provinces in 1992. Most (72%) of the RCW clusters on private lands (excluding the Red Hills region of south Georgia and north Florida) that were active in 1982 had become inactive by 1992.

This decline appears to have resulted from the loss of cavity trees, inadequate foraging habitat, inadequate burning, habitat fragmentation, and population isolation (Baker 1995).

Currently, there are no active clusters known from private lands immediately adjacent to Ft. Benning, making recovery dependent on management of the Ft. Benning population. However, Ft. Benning is working with The Nature Conservancy and the ACUB program to include private lands adjacent to the Installation that may harbor RCWs in the future as part of the land base that may contribute to RCW recovery.

3.3 Numbers, Reproduction, and Distribution of Red-cockaded Woodpeckers

Note: *The information below is from the Services Draft - 2018 RCW Species Status Assessment*

Species-wide, the population trend of the RCW is increasing. In 1993/1994, the range-wide population was estimated at 4,694 active clusters; in 2006 it was 6,105. Of the 40 primary core, secondary core, and essential support recovery populations, 36 (90 percent) were either stable or increasing based on the average annual growth (number of active clusters) during the most recent 5-year growth period (2002-2007) for which data is available. Only 4 (10 percent) populations had a declining trend: Central Florida Panhandle Primary Core (-0.1 percent), St. Sebastian River Essential Support (-3.0 percent), Three Lakes Essential Support (-1.7 percent), and Oakmulgee Secondary Core (-4.0 percent). The average annual percent growth of 16 (44 percent) of the 36 stable or increasing recovery populations met or exceeded the 5 percent annual growth objective in the Recovery Plan. Of the 11 recovery units, only the Upper East Gulf Coastal Plain had a net declining 5-year trend due to the declining population in the Oakmulgee Ranger District, Talladega National Forest.

Although some recovery populations are composed of one of more properties (e.g., because the properties are adjacent to one another), most recovery populations (64%) are located on one property/ownership. The RCW Recovery Plan identifies 63 properties involved in recovery: 26 primary core (PC), 14 secondary core (SC) and 23 essential support (ES). At a property level as of 2007, 16 (25 percent) had a net 5-year declining trend.

Large recovery populations remain rare. Of the 63 recovery properties, only 6 (15 percent) exceed 250 active clusters. Sixty-eight percent (10 populations) consist of less 100 or fewer active clusters, and 43 percent (9 populations) have less than 50 active clusters. The number of active clusters or PBGs on each property and designated recovery population occur at different densities and aggregations in response to the configuration of the property, available habitat, and the location of unsuitable habitat. Red cockaded woodpecker clusters and aggregations within and among properties may or may not actually represent a demographically functional RCW population under current conditions. Furthermore, some populations may remain subdivided at recovery. The extent that PBGs are spatially aggregated will affect population viability and persistence. Comprehensive spatial and GIS assessments of PBG aggregations, fragmentation, and population structure are not available for most properties and populations. However, several trends and patterns are evident. At least 10 of the 40 recovery populations are appreciably fragmented under current and likely future, conditions.

At least four primary core recovery populations are currently subdivided and likely will remain so at recovery. The Central Florida Panhandle Primary Core population, the largest, is comprised of 4 properties where most RCWs reside in the Apalachicola Ranger District (RD) and Wakulla Ranger District of the Apalachicola National Forest. The Wakulla RD and Apalachicola RD are separated by the Ochlockonee River and private lands, for a distance of least 5 miles that may limit RCW dispersal (James et al. 1997). Potential breeding groups in the two districts are highly unlikely to be demographically isolated, but demographic function may be compromised. If so, the Central Florida Panhandle Primary Core population at recovery, with at least 1000 PBGs, may function as one or more subdivided populations. Demographic and environmental stochasticity is not expected to pose any viability risk, but the ability of this recovery population to retain genetic variation will be less than anticipated.

An analysis of 2007 RCW data from 121 properties with RCWs submitting reports via the Annual RCW Report illustrates the status of the species at the property scale for recovery as well as populations not designated for recovery. Although a few large populations exist on individual properties, most (74 percent) property populations are small, much more vulnerable populations of 50 or fewer active clusters.

In spite of the relatively small size of most populations, the status of RCWs has been consistently improving since the early 1990s. This steady increase can be attributed to various factors, including aggressive prescribed burning programs, artificial cavity provisioning and regional translocation cooperatives and strategies (Costa and DeLotelle 2006). Implementation of these habitat and population management tools and techniques has successfully reversed the regional declines of the previous decades.

3.4. Conservation Needs and Threat of Red-cockaded Woodpeckers

As stated previously in the proposed Action, the essential conservation applications needed to implement Ft. Benning's INRMP and subsequently, this 2018 Update, includes but are not limited to: (1) application and control of fire as a means to further develop the desired future condition for the Installation's pine/grass systems, which at a minimum, supports both RCW clusters and foraging habitat, (2) protection and development of large, mature longleaf pines throughout the landscape, (3) protection and maintenance of existing RCW cavities and judicious provisioning of artificial cavities to ensure all clusters maintain a minimum of 4 suitable cavities, (4) restoration and maintenance of sufficient habitat quality and quantity to support the RCW population necessary for recovery on Ft. Benning, (5) limited provisioning of sufficient recruitment clusters in locations chosen to enhance the spatial arrangement of groups, and (5) continued monitoring of those clusters still covered by Incidental Take authorizations to validate persistence and reproductive health so they can again count towards the Installation's population recovery goal of 351 PBGs.

Primary threats to species viability for RCWs all have the same basic cause: lack of suitable habitat in a fire-maintained ecosystem. On public and private lands, the quantity and quality of RCW habitat are impacted by past and current fire suppression and detrimental silvicultural practices (Ligon et al. 1986, 1991, Baker 1995, Cely and Ferral 1995, Masters et al. 1995, Conner et al. 2001).

Serious threats stemming from this lack of suitable habitat include: (1) insufficient numbers of cavities and continuing net loss of cavity trees (Costa and Escano 1989, James 1995, Hardesty et al. 1995), (2) habitat fragmentation and its effects on genetic variation, dispersal and demography (Conner and Rudolph 1991), (3) lack of good quality foraging habitat (Walters et al. 2000, James et al. 2001), and (4) fundamental risks of extinction inherent to critically small populations from random demographic, environmental, genetic, and catastrophic events (Shaffer 1981, 1987).

Red-cockaded woodpecker population size is significantly limited by the availability of cavity trees and suitable, stable clusters. The natural growing season fire regime has been lost due to fire suppression and landscape alterations that have altered the availability of lightning-flammable fine plant litter fuels. In the absence of prescribed fire, fire intolerant hardwoods survive and grow to midstory or higher levels in the forest canopy. Red-cockaded woodpecker's being sensitive to midstory hardwood encroachment, will abandon their cavities and clusters due to hardwood encroachment (Conner and O'Halloran 1987; Costa and Escano 1989).

4. ENVIRONMENTAL BASELINE

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the RCW, its habitat, and ecosystem within the Action Area. The environmental baseline is a "snapshot" of the species' health in the Action Area at the time of the consultation, and does not include the effects of the Action under review. The total land base affected by implementation of the 2018 Update encompasses approximately 216,748 acres (U.S. Army 2008). A detailed description of Ft. Benning's location, mission, history, physiographic and biological environment, past and present land use, and a synopsis of past Service BO's, which are all part of the environmental baseline that contribute to the current status of the species and its habitat on the installations, can be found in the Installation's INRMP, along with previous RCW ESMC versions and the 2018 Update.

4.1. Action Area Numbers, Reproduction, and Distribution of Red-cockaded Woodpeckers

All RCW cavity trees on Ft. Benning are located and mapped using a Geographical Positioning Systems and data is maintained in ArcView™ and Access™ databases. These data are updated annually based on results of the spring cluster inspections. Data for new trees are added as the trees are discovered.

Fort Benning's personnel have surveyed all of the Installation for RCWs, including the A20 and K15 dudded impact areas. The Installation documents that the K15 dudded impact area was surveyed aerially in 2009, of which 4 active clusters were identified. Of the 75 known clusters in A20 that have been identified, there are 67 clusters that are currently manageable. One cluster (A20-47) is located in an area also deemed too hazardous by the Army's Explosive Ordinance Division (EOD) experts and will never be accessible from the ground, managed, or counted. There are an additional 7 clusters that are currently inaccessible due to potentially hazardous conditions. These clusters may again be accessible at some point in the future, but currently are not being managed or counted.

After an assessment of Unexploded Ordinance (UXO) potential by EOD experts was conducted, 3 clusters located on the periphery of A20 impact area were added as manageable clusters in 2002 (USFWS 2002). An additional 11 - A20 clusters were added to management that could be counted towards the population recovery goal as a result of the Digital Multipurpose Range Complex (DMPRC) BO (USFWS 2004). In 2009, 36 clusters from the remaining pool of accessible A20 clusters were added that could be counted toward the Installations recovery goal as a result of the Maneuver Center of Excellence (MCoE) BO (USFWS 2009). Although the total number of manageable clusters in the A20 dudded impact is currently 67, in any given year only 50 (3 + 11 + 36 = 50) of the A20 clusters with PBGs are counted towards the Installation's 351 PBG recovery goal per the 2009 MCoE BO (USFWS 2009).

The total number of incidental take authorizations that have been issued for all RCW clusters located outside of the dudded impact areas due to the DMPRC, Base Realignment And Closure (BRAC), MCoE, Supplemental MCoE, and firing range M6 BOs, collectively, were 101 clusters. Incidental take actually occurred for 7 of the clusters (IT was authorized for cavity tree removal (harm)). A net total of 30 incidental take authorizations were removed through formal consultation with the Service under the Enhanced Training BO (USFWS 2015). After consultation with the Service in December of 2017, the Service concurred with Fort Benning's 5 year post-project monitoring analysis that incidental take authorizations for 9 clusters were no longer needed (USFWS 2017a). Thus, 55 existing clusters remain today that are currently covered under incidental take authorizations (101 - 7 - 30 - 9 = 55). These 55 clusters (54 active, 1 inactive) still persist on the landscape and are currently being managed. Appendix 4 of the 2018 Update summarizes all incidental take authorizations, past and present, which have been issued for RCW clusters on Ft. Benning, as well as the current cluster status.

Upon the Installation's completion of their 2017 annual RCW nesting season monitoring, a total of 402 manageable clusters were identified on Ft. Benning (400 active and 2 inactive). This number includes all manageable clusters in A20, as well as all clusters still covered under incidental take authorizations. Of these 400 active clusters, the Installation reports 387 were found to be PBGs, 8 were solitary groups, and 5 were considered captured clusters (Appendix 5 in the 2018 Update).

The numbers above are further broken down for manageable clusters in A20 as follows: 67 were identified as active (64 PBGs, 2 solitary groups, 1 captured cluster) and 0 were inactive. Only 50 of these PBGs can be counted towards the Installation's population recovery goal. Clusters covered by incidental take authorizations and therefore cannot be counted towards recovery are as follows for the 55 taken clusters: 54 were identified as active (52 PBGs, 2 captured clusters) and 1 was inactive.

Excluding all clusters within the A20 dudded impact area and all groups covered by incidental take authorizations, there are 280 manageable clusters (279 active and 1 active) remaining. Of these active clusters, the Installation reports 271 were identified as PBGs, 6 were solitary bird groups, and 2 were captured clusters). All of these clusters count toward Ft. Benning's population recovery goal. By adding the 50 PBGs in A20 that can be counted towards recovery to the remaining 271 PBGs not covered by incidental take, the current total of PBGs that are counted towards recovery is 321 PBGs.

4.2. Action Area Conservation Needs and Threats

The narrative below is derived from the 2018 Update, Appendix 6:

Analysis of the Number of Red-cockaded Woodpecker Clusters Required to Achieve 350 Potential Breeding (Costa, 2013).

Based on previous calculations, it was assumed that Ft. Benning would require 421 territories to harbor 351 PBGs. The purpose of this analysis is to update the numbers of territories and active clusters required for Ft. Benning to reach recovery based on current Ft. Benning data supported by similar data from all recovered primary core and one other large population (Ft. Stewart [Army Installation]). It is known that as RCW populations expand toward their "carrying capacity" (based on a territory per 150 acres on Ft. Benning) the percentages of unoccupied (i.e., inactive) clusters, captured clusters and clusters occupied by solitary birds decrease. This relationship, i.e., low percentages of non-PBG territories at "carrying capacity", appears to hold true regardless of population size if habitat is suitable, including availability of suitable cavities. However, populations undergoing expansion, particularly rapid growth, may have rather large percentages of solitary male groups. With a basic understanding of today's RCW populations and their management, the reason for the low percentage of non-PBG territories at property carry capacity becomes apparent.

Today, all RCW populations occur on isolated habitat islands ranging in size from <2,000 to over 250,000 acres. Based on forest type and current habitat conditions, these islands can and do support RCW populations of various sizes. Via strategic and effective population and habitat management, expansion of these populations, regardless of their size, has become routine, predictable and successful. Even the smallest populations (~10 territories) can be and are being expanded and maintained as stable with focused management (Letcher et al. 1998, and Costa and Daniels 2004). Indeed numerous (n=6) new populations have been reintroduced into suitable habitat and are similarly stable and/or expanding. At carrying capacity (RCW group per 70 to 300 acres depending on habitat) and with normal annual recruitment, it appears uncommon for suitable territories, in any population of ~10 groups or larger, to remain unoccupied or in a solitary bird status for any significant length of time, e.g., beyond two dispersal seasons. With normal levels of annual recruitment, suitable unoccupied natural (old trees) or artificial (recruitment clusters) nesting habitat and breeding vacancies are quickly filled. This is not surprising even in small populations given that offspring have few options to find suitable habitat off-property.

The relatively high observed subadult "mortality" rates (i.e., birds not seen again in the study area/population during their first potential breeding season) previously documented in RCWs (see Walters et al. 1988) likely reflects that annual natality (recruitment) typically exceeds mortality within most populations. Therefore, "surplus" birds are destined to "float" or disperse (from the property), thereby exposing themselves to risks of predation and exposure. Additionally, if the capacity of the property/habitat to support RCWs (either naturally via old trees or artificially via recruitment clusters) is limited, the opportunities for so-called surplus birds to pioneer or occupy recruitment clusters is also limited and again their options are to float or disperse, increasing the probability of mortality. However, when nesting habitat is available it

is typically quickly occupied which is why today so many populations are rapidly increasing. These landscape, habitat and ecological realities all support the concept that under normal circumstances a sufficient pool of subadults is annually available to either support population expansion or maintain population stability in populations at carrying capacity if suitable habitat is available. In determining the number of total territories required at recovery to achieve their designated PBG goal, some populations have incorrectly used their current number of recruitment clusters in their calculations. There is a problem with this procedure that results in misleading information and ultimately incorrect analyses. Note: the information presented in this analysis does not use these erroneous data sets. At carrying capacity there will be no recruitment clusters once all territories are occupied. Therefore, using the number of them in a calculation today to represent a "normal" percentage of inactive clusters in a future "recovered" condition is inappropriate.

Many populations today have numerous recruitment clusters on their property; e.g., in some cases a number equal to10% or even more of their number of active clusters. Using these in the "recovery" goal calculation (i.e. number of territories required for x number of PBGs) today results in a seriously inflated over-estimate of the number of "inactive" clusters that will occur in a population at its future carry capacity. In other words, the percentage of "inactive" clusters in today's populations is significantly higher than the percentage that would be expected at carrying capacity because today's populations are undergoing an aggressive population expansion program (i.e., recruitment clusters), resulting in many "inactive" clusters.

At carrying capacity there will be no such program and most territories will be and will remain occupied. Not surprising, the Apalachicola [National Forest], the largest RCW population is a perfect example of the reality that there will be few inactive clusters in recovered populations. Many other current populations support this fact.

Summarizing Ft. Benning's data, on average, at any given time in recovered and large populations approximately 7% of territories will be unoccupied, 2% will be occupied by solitary males, 3% will be captured and 88% will be occupied by PBGs. Therefore, based on the averages, to achieve a population goal of 350 PBGs, 398 "managed" or suitable territories would be required. However, based on Ft. Benning specific data, only 390 managed clusters would be required because 90%, not 88% (the average of the 6 populations), of managed clusters harbor PBGs.

Based on the 6-population analysis, an average of 372 active clusters would be required to maintain 350 PBGs. Note that on Ft. Benning only 370 active clusters would be required to support 351 PBGs because 95%, not 94% (the average of the 6 populations) of active clusters harbor PBGs.

There is no reason to believe (except for catastrophic events and lack of habitat management) or data to support the idea that when a population achieves its carrying capacity regardless of its size, but especially for large (>250 territories) populations, that a significant percentage of territories will be unoccupied. Based on the data examined for this paper the average percent of inactive territories was 7% with a range of 1 to 15%. Again, based on the discussion above, the reasons for this are intuitive and driven by the species ecology and the current configuration of

remaining RCW habitats throughout the southeast. That is, populations are isolated islands that have achieved or will reach their RCW carrying capacity and then annually maintain that density. Of course, some small percentage (current data suggests on average it will ~7% or less); of territories will likely become unoccupied annually due to local stochastic events, e.g., loss of cavity trees or predation. However, even in small populations or subpopulations, assuming normal recruitment, suitable territories would be expected to be quickly reoccupied.

5. EFFECTS OF THE ACTION

This section analyzes the direct and indirect effects of the Action on the RCW (Note: No interrelated and interdependent actions were reported by the Installation). Direct effects are caused by the Action and occur at the same time and place. Indirect effects are caused by the Action, but are later in time and reasonably certain to occur. Our analyses are organized according to the description of the Action in section 2 of this BO.

5.1. Effects of the K15 Arial Herbicide Application on Red-Cockaded Woodpeckers

Direct effects. Fort Benning reports an estimated 125 acres of contiguous and 11 acres of noncontiguous pine dominated habitat (based on aerial delineations) within .5 miles of the K15-D cluster center would be taken. Based on the Installation's 2009 aerial survey, 2 inactive cavity trees (relics) to the north of RCW cluster K15-D, 1 inactive cavity tree (enlarged), 1 active start tree, and 3 active cavity trees within the K15-D cluster would be taken. Given that the majority of contiguous pine dominated habitat associated with RCW K15-D cluster would be taken as a result of this Action component, it would therefore not be expected for this RCW cluster/group to persist on the landscape.

The Installation also reports this proposed Action component would remove approximately 0.06 acres of suitable habitat from the foraging partition of cluster K37-A and 1.57 acres of suitable and 4.3 acres of unsuitable habitat from the foraging partition of cluster K36-A. Post-project foraging partition values that were calculated using the Ft. Benning Standard for Managed Stability for RCW cluster K36-A indicated that 5,977.65 BA2 of >10" pine on 120.78 acres and 5,117.12 BA2 of >10" pine on 110.42 acres for cluster K37-A would remain leaving these groups significant amounts (on average, > 3,000 BA2 for > 10" pines/per RCW territory/partition) of suitable habitat.

Unmanageable overstory pine removal that is within the .5 mile foraging partitions of adjacent RCW clusters located outside of K15 that falls within the K15 impact area boundary include: approximately 8.3 acres for cluster K36-A, 1.1 acres for K37-A , and 2.6 acres for cluster K27-C. Fort Benning suggests, and the Service acknowledges, that since all forested stands within this impact area are inaccessible and cannot be managed, no forest stand inventory data exists and have never been considered or included in any foraging habitat analyses for previous projects.

Indirect effects. The northwestern boundary of the proposed treatment area is approximately 1 mile from the cluster center of K15-A. The nearest cluster center distances measured from surrounding clusters to K15-D include: 2.0 miles from K15-A to the northwest, 1.08 miles from

K36-A and 1.3 miles from K37-A to the southwest, 1.45 miles from K35-C, 0.84 miles from K27-C to the northeast, and 1.2 miles from K28-C to the southeast. Since all K15 impact area clusters have been permitted under an incidental take statement since 2002 and no management or monitoring is possible, all neighborhood analyses for any previous projects have never included or considered any of the K15 clusters as part of the analyses. Of the 522 acres that are proposed for treatment by way of aerially spray with herbicide, a total of approximately 272 acres are identified as unmanageable overstory pine that would be removed from the southern portion of K15.

5.2. Effects of Fire Management on Red-Cockaded Woodpeckers

Direct effects: In the 2018 Update, the Installation reports from 2008-2013, 25 active trees have died due to wildfires – all trees survived the actual wildfire event but later were found dead; at least 6 of the trees were also found to have an Ips beetle (*Ips sp.)* infestation so the Installation suggest that a wildfire may not have actually killed the tree but may have left it more vulnerable to beetle attacks. Individual RCWs, nests containing eggs and/or nestlings, cavity trees, and foraging habitat can be injured or destroyed as the result of wildfires and/or prescribed burning. Measures currently taken to prevent damage or destruction to RCWs and/or cavity trees include raking or burning around cavity trees and the use of water and fire retardant materials will continue. Foraging habitat is protected during prescribed burns by preparing and implementing a burn plan. The Installation burn plan describes parameters such as weather and fuel conditions and equipment and personnel required to accomplish prescribed burn objectives while not adversely affecting RCW habitat. Even with these precautions, local weather changes, higher than estimated fuel loads, and other unforeseen factors may cause escaped prescribed burns or out of prescription burns (e.g., drought conditions). Fire plows will be used in clusters only during emergency situations. The Installation will notify the Service within 24 hours of discovery of any take occurrence. Artificial cavity replacement or augmentation (based on total group size) will take place in any cavity deficient cluster within 2 working days as provided for in the 2007 Army Guidelines.

In spite of these precautions, and although no takes are anticipated, the Installation has requested incidental take coverage for 2 RCW groups, 1 nest, and/or up to 8 active RCW cavity trees for the remaining 5-year life of the parent RCW ESMC (5-years ends November 2019) for all HMUs outside of A20, resulting from fire management/fire effects. The Service assessment supports the Installation's analysis, specifically, when the severity of drought conditions exacerbates the fire weather parameters like those experienced in 2016. The Service and the Installation agree that the 2016 drought weather condition demonstrates the need for additional protections.

Indirect effects: Prescribed burning can indirectly affect RCWs by killing and/or injuring existing and potential cavity trees, either making them immediately, or eventually rendering them, unsuitable for RCWs. Controlled burns also could result in crown fires, killing old growth and other pine trees that comprise potential roosting, nesting and foraging habitat within RCW partitions. There are situations when following the requirement to provide foraging habitat at the recommended levels may indirectly adversely affect RCW, over the short-term, by conflicting with other management activities deemed necessary to benefit the RCW over the long-term. Those situations include thinning pine stands, reducing southern pine beetle risk, encouraging advanced regeneration, improving quality of foraging habitat, and restoring off-site species to

longleaf pine. Potential adverse effects on RCWs, caused by going too far below the foraging habitat standards when implementing actions to address one of the situations discussed above, will be avoided by adhering to the standard for managed stability guidelines described in Appendix 5 of the Recovery Plan (USFWS 2003).

Four of the six groups that suffered nest failure related to controlled burning retained breeding group status in the years following nest loss. The remaining two, both losing nests in 2006 were reduced in status from "breeding" to "active" in 2007. One of the four groups that lost nests to wildland fire remained in breeding status for all of the following years. The cluster of the second group changed in status from "breeding" to "active," then back to "breeding." The third cluster went inactive the following year and was reactivated the third year. The last nest failure associated with wildland fire was lost in 2007. The 2018 Update states that there are no group datasets available for this cluster.

In preparation of the 2018 Update, Ft. Benning extrapolated the observed nest loss rate to the entire Ft. Benning population and determined that one nest may be lost each nesting season as a result of prescribed burning. Also, one nest may fail each year due to wildland fire. Annual checks of all known cavity trees in all clusters post-wide revealed that 24 cavity trees were lost to prescribed fire. Wildland fire was the cause of mortality of 38 cavity trees over this period. Using these data, Ft. Benning estimated that eight cavity trees and as many as two nests may fail each year as a result of fire management/fire effects.

Fort Benning determined its population objectives by considering the acreage and distribution of suitable pine and pine/hardwood stands, military training, operational, and infrastructural requirements, and biological needs of the red-cockaded woodpecker in the Sandhills Primary Core Recovery population. Overall, the 2018 Update when implementation, is intended to benefit the RCW on Ft. Benning by enhancing RCW habitat quality to conform to the Recovery Standard, with the intention of sustaining the installation's population size at or above the level at which the species is considered recovered. Overall, implementation of the 2018 Update should facilitate the Installation's ability to maintain its recovery goal, and remain in compliance with all RCW Guidelines, which will further ensure the stability of the population by promoting growth at the installation's full carrying capacity. Provisioning planned recruitment clusters, combined with any new natural occurrences of budded and pioneered clusters are also expected to sustain population growth on the installation.

5.3. Summary of the Effects of the Action

The principal objective of this Action and subsequently its Action components is to amend the current incidental take statement for RCW cluster K15-D to include maintenance activities that would allow restoration of LOS between the observation points located outside the boundary of K15 to the targetry located within, for the purpose of maintaining large caliber weapon systems, live-fire military training capability. This maintenance activity would be in the form of an aerial herbicide application(s) that would over time remove most of the contiguous, unmanageable pine overstory associated with cluster K15-D within the K15 dudded impact area, as well as 3 active cavity trees and 1 active start tree. Although the Installation suggests that 2 active and 1 inactive cavity trees would remain, as well as a small buffer of overstory pine adjacent to overstory

hardwood that will be left intact as a streamside buffered area, Ft. Benning's and the Service's analysis suggests that the cluster would not be expected to persist on the landscape.

Since the large drainage associated with Pine Knott Creek already serves as a natural impediment to north-south movement by RCWs in clusters located approximately .5 miles to the south of the K15 boundary, the proposed action would not be expected to significantly change RCW dispersal patterns in this direction. Although contiguous overstory pine on the north side of this drainage currently does not fully connect the eastern boundary of K15 to the western boundary, it would be reasonable to assume that east-west movement by RCWs in this southern area would be impeded to some degree by removal of most of the overstory pine. However, of the 2,609 acres of unmanageable overstory pine identified in K15, 2,339 acres would remain post-action where contiguity between those stands currently exists and would continue serving as travel corridors for RCWs.

The Army determines that Action component 1(K15 aerial herbicide treatment) is likely to adversely affect RCW cluster K15-D. Since this RCW cluster is already covered under an incidental take statement, amending the allowable actions to the existing incidental take statement will not change any of the population numbers reported in this 2018 Update.

The Installation's determination for Action component 2 (fire management/fire effect), during drought conditions is may effect, likely to adversely affect the RCW, but implementation of the proposed 2018 Update in its entirety, and over the long-term, is beneficial to RCWs and is in direct support for the recovery of the Installation's RCW population.

5.4. Tables and Figures for Effects of the Action

Figure 1. Effects of the 2018 Update (Action).

Action/Action Components	RCW Cavity Trees	RCW Nestlings, Eggs, Chicks (Nest)	RCW Groups
K15 Aerial Herbicide	4	1	1
Fire Management/Fire Effects: Extreme Drought	8	1	2
Total	**12**	**2**	**3**

Source: Fort Benning's, 2018 ESMC Update.

6. CUMULATIVE EFFECTS

For purposes of consultation under ESA §7, cumulative effects are those caused by future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area. Future Federal actions that are unrelated to the proposed action are not considered, because they require separate consultation under §7 of the ESA. No cumulative effects are known to occur that will affect RCWs within the Action Area.

7. CONCLUSION

In this section, we summarize and interpret the findings of the previous sections (status, baseline, effects, and cumulative effects) relative to the purpose of a BO under §7(a)(2) of the ESA, which is to determine whether a Federal action is likely to:

a) jeopardize the continued existence of species listed as endangered or threatened; or
b) result in the destruction or adverse modification of designated critical habitat.

"Jeopardize the continued existence" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02).

Overall, range-wide RCW population numbers are increasing. From 1993 through 2006, the range-wide RCW population estimates were 4,694 active clusters to 6,105, respectively (Draft RCW Species Status Assessment, 2018). Roughly 36 of the 40 (90%) primary core RCW recovery populations were either stable or increasing. Between 2002 and 2007, only 4 (10%) of the populations were in decline. Large recovery populations remain rare with only 6 (15%) exceeding 250 active clusters. Generally, the status of RCWs has been consistently improving since the early 1990's.

Currently, the Installation's RCW population includes 402 manageable clusters, of which, 400 are active and 2 are inactive. Fort Benning reports that 55 groups are currently covered [permitted] as incidentally taken. The Installation's RCW recovery population goal is 351 potential breeding groups. From data collected between 2009 and 2013, the Installations data reveals the sum average of potential breeding groups was 92%. Across the Installation (± 80,000 acres of manageable RCW habitat), RCW distribution is generally balanced among four habitat management units. The units are broken down according to land use, accessibility, and RCW demographics. The conservation needs for RCWs across the Installation are being met, primarily by implementing the Installations INRMP. Threats to RCWs at the population level are minimal; pine tree species conversion is most likely the most apparent challenge (i.e., converting off-site pine species to site appropriate species - e.g., loblolly pine to longleaf pine where appropriate).

Implementing the 2018 Update is reasonably certain to affect the Installation's RCWs, specifically, from two Action components. Action component 1 – the aerial herbicide treatment proposed for portions of the K15 Impact area which will eliminate overstory trees as a means to enable LOS for military training events. The herbicide will eliminate RCW cavity trees in cluster K15-D. This action is reasonably certain to harm the K15-D RCW group.

Action component 2 – fire management/fire effects has, and will continue to affect RCW's on Fort Benning through time. The Installation reports, through data extrapolation, the observed nest loss rate to the Fort Benning RCW population is roughly 1 nest/nesting season. The Installation further reports the extrapolated data reveals roughly 62 RCW cavity trees were adversely impacted over a 6-year period (2008-2013).

No cumulative effects are known to occur that will affect RCWs within the Action Area. It is the Service's opinion that the Installation's 2018 Update is primarily beneficial to the status of the RCW population rang-wide and its conservation needs. The net change that is anticipated and/or is reasonably certain to occur is not considered biologically meaningful at the Installation level or at a range-wide scale.

After reviewing the current status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of **RED-COCKADED WOODPECKERS**.

8. INCIDENTAL TAKE STATEMENT

ESA §9(a)(1) and regulations issued under §4(d) prohibit the take of endangered and threatened fish and wildlife species without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA §3). In regulations at 50 CFR §17.3, the Service further defines:

- "harass" as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering;"
- "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering;" and
- "incidental take" as "any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

Under the terms of ESA §7(b)(4) and §7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

This BO evaluated effects of the Action on red-cockaded woodpeckers, which is also protected under the Migratory Bird Treaty Act, and determined that incidental take of this species is reasonably certain to occur. The Service will not refer the incidental take of this species for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the Terms and Conditions specified below.

For the exemption in ESA §7(o)(2) to apply to the Action considered in this BO, Ft. Benning must undertake the non-discretionary measures described in this ITS, and these measures must become binding conditions of any permit, contract, or grant issued for implementing the Action. The Installation has a continuing duty to regulate the activity covered by this ITS. The protective coverage of §7(o)(2) may lapse if Ft. Benning fails to:

- assume and implement the terms and conditions; or
- require a permittee, contractor, or grantee to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit, contract, or grant document.

In order to monitor the impact of incidental take, Ft. Benning must report the progress of the Action and its impact on the species to the Service as specified in this ITS.

8.1. Amount or Extent of Take

The Service anticipates that the Action is reasonably certain to cause incidental take of individual RCWs (and or RCW cavity trees) consistent with the definition of harm, specifically from Action component 1, the K15 impact area aerial herbicide application, and from Action component 2, fire management/ fire effects (see section 5.3, Summary of the Effects of the Action). In total, the Service estimates incidental take authorization for 3 groups, 2 nest, and/or up to 12 active RCW cavity trees for the remaining life of this 2018 Updated (20 November 2019).

This section specifies the amount or extent of take of RCWs that the Action is reasonably certain to cause, which we estimated in the "Effects of the Action" section of this BO. We reference, but do not repeat, these analyses here.

8.2. Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures (RPMs) are necessary or appropriate to minimize the impact of incidental take caused by the Action on RCWs.

RPM #1. Coordinate with the Service prior to implementing the K15 aerial herbicide treatment. Although the Installation has accounted for the anticipation of adverse effects to RCWs upon the application of the K15 herbicide treatment, little was documented regarding the details of the chemical proposed for use, concentrations used, etc. Once known, the Installation should confer with the Service prior to implementation.

RPM #2. Coordination Fire Management/Fire Effects with the Service during drought conditions . Coordinate with the Service when fires occur, or are planned to occur, in managed RCW clusters when fire weather condition thresholds are breached or are proposed to be waived by the Installation so prescribed burns can take place. Fire condition/thresholds are listed in the Installation's Prescribed Burn Checklist (Appendix M, page 116, of the Integrated Wildlands Fire Management Plan).

8.3. Terms and Conditions

In order for the exemption from the take prohibitions of §9 and of regulations issued under §4(d) of the ESA to apply to the Action, the Installation must comply with the terms and conditions (T&Cs) of this statement, provided below. These T&Cs are mandatory. As necessary and appropriate to fulfill this responsibility, Ft. Benning must require any permittee, contractor, or

grantee to implement these T&Cs through enforceable terms that are added to the permit, contract, or grant document.

T&E #1. Coordinate with the Service prior to applying herbicides in the K15 Impact Area (RPM #1). The Installation should develop an herbicide plan that closely a lines with the Standard Operating Procedures used by the US Forest Service. Elements include drift mitigation measures, unit marking strategies, on the ground unit marking (although the Service acknowledges much of the unit is in the K15 Impact Area) pretreatment recon flight, post treatment considerations and tasks, etc. For complete detail on Forest Service protocols, see https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497004.pdf, Appendix N, Aerial Spray Guidelines and Drift Model Results.

T&C #2. Coordination with the Service during drought conditions (RPM #2). When fire adversely impacts RCWs and/or RCW cavity trees, the Installation will replace each cavity by creating an artificial cavity in close proximity to the unsuitable cavity tree as soon as qualified personnel can be mobilized and on the site. Where possible, select longleaf pine as the preferred alternative among suitable pine tree species. Use the Drill Cavity Technique as the first option where time and accessibility are not limiting factors (discuss immediately with the Service unless time and or accessibility is a critical factor for successful replacement). Face all cavities south to southwest facing where possible. Follow all appropriate Installation SOP's that apply to RCW cavity installations and management. Inform the Service on the incidental take tally (i.e., subtracting from the allotted incidental take authorized) upon determining the cavity tree's mortality.

8.4. Monitoring and Reporting Requirements

In order to monitor the impacts of incidental take, Ft. Benning must report the progress of the Action and its impact on the species to the Service as specified in the incidental take statement (50 CFR §402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting (M&R). As necessary and appropriate to fulfill this responsibility, the Installation must require any permittee, contractor, or grantee to accomplish the monitoring and reporting through enforceable terms that are added to the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify the Installation and the Service if the amount or extent of incidental take specified in this ITS is exceeded during Action implementation.

M&R #1. K15 Herbicide Inspections (RPM #1). Prior to the K15 herbicide treatment being applied, the Installation should develop a monitor/inspection scheme that will inform the Service and Ft. Benning on the accuracy and effects of the application (e.g., drift/overspray mortality to target species and/or non-targeted species, further treatment required, etc).

M&R #2. Post Burn Inspections (RPM #2). Immediately (within 24 hours) after cavity replacement, provide the Service with all documents/forms etc. associated with the fire. This includes, but is not limited to: The Prescribed Burn Checklist, information afforded to the Director of DPW when a recommendation is made to burn outside of the standards

outlined in the Prescribed Burn Checklist, Forestry Weather & Smoke Management Forecast data from District 7 (Americus, Georgia), Keetch-Byram Drought Index (KDBI) map of Georgia for the timeframe covering the fire event day (i.e., adverse effect to RCW cavity tree). Inform the Service on the incidental take tally (i.e., subtracting from the authorized incidental take) upon determining the cavity tree's mortality. In addition to following prescribed burning activities and/or standard operating procedures for responding to active fire affects outside of the impact areas, Ft. Benning will inspect all managed RCW clusters for adverse RCW cavity tree impacts once the burn areas are safe to inspect.

9. CONSERVATION RECOMMENDATIONS

§7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid or minimize the adverse effects of a proposed action, implement recovery plans, or develop information that is useful for the conservation of listed species. The Service offers no Conservation Recommendations for this Action.

10. REINITIATION NOTICE

Formal consultation for the Action considered in this BO is concluded. Reinitiating consultation is required if Ft. Benning retains discretionary involvement or control over the Action (or is authorized by law) when:

a. the amount or extent of incidental take is exceeded;
b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this BO;
c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
d. a new species is listed or critical habitat designated that the Action may affect.

In instances where the amount or extent of incidental take is exceeded, Ft. Benning is required to immediately request a reinitiation of formal consultation.

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