United States Department of the Interior

Fish and Wildlife Service
105 West Park Drive, Suite D
Athens, Georgia 30606

West Georgia Sub Office
Post Office Box 52560
Fort Benning, Georgia 31995

Coastal Sub Office
4980 Wildlife Drive, NE
Townsend, Georgia 31331

November 20, 2014

Colonel Michail S. Huerter
Garrison Commander
Department of the Army
Headquarters, United States Army Maneuver Center of Excellence
Fort Benning, Georgia 31905-5000

Re: **USFWS Log Number 2014-F-1128**

Dear Colonel Huerter:

This document transmits the U.S. Fish and Wildlife Service's (Service's) Biological Opinion (BO) based on our review of the Endangered Species Management Component (ESMC) for Fort Benning, Georgia, our review of the current military training mission of Fort Benning, and their effects on the federally-endangered red-cockaded woodpecker (*Picoides borealis*) (RCW), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended, (16 U.S.C. 1531 et seq.). Your request for formal consultation was received on June 23, 2014.

This biological opinion is based on information provided in the Installation's Integrated Natural Resources Management Plan (INRMP) 2014 Revision; the 1996 and 2007 Management Guidelines for the Red-cockaded Woodpecker on Army Installations (1996 or 2007 Army Guidelines, respectively); field investigations; discussions with experts; and other sources of information. A complete administrative record of this consultation is on file at the Service's West Georgia Sub Office.

Your letter of June 23, 2014, requesting formal consultation for the RCW, also requests that the Service initiate informal consultation for the wood stork (*Mycteria Americana*), American alligator (*Alligator mississippiensis*), shinyrayed pocketbook (*Lampsilis subangulata*), relict trillium (*Trillium reliquum*), and Georgia rockcress (*Arabis Georgiana*) along with approval of the Installation's INRMP. Based on the information contained in the INRMP and each species ESMC, and observations from numerous field investigations on Fort Benning by Service personnel, the Service concurs with your determination for these species.

Consultation History

June 2014	On June 23, 2014, the Service received Fort Benning's request for formal consultation along with a final copy of the INRMP and appended ESMCs.
July 2014	On July 9, 2014, the Service initiated formal consultation.
November 2014	On November 19, 2014, the Service and the Installation reviewed the Draft BO.
December 2014	On December 2, 2014, the Installation requested an extended comment period to review the ESMC BO. The Service agreed and set December 29, 2014, as the new deadline. From December 30, 2014 through January 12, 2015, the Service reviewed Installation comments and finalized the Opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Project Background

This Endangered Species Management Component fulfills Fort Benning's requirements under the Endangered Species Act of 1973, as amended (ESA). The Red-cockaded woodpecker ESMC was prepared in accordance with Chapter 4 of Army Regulation (AR) 200-1, the 2007 Management Guidelines for the Red-cockaded Woodpecker on Army Installations (RCW Guidelines) and the Sikes Act (16 U.S.C.670a). The RCW was federally listed as endangered by the Service on 13 October 1970 and is protected under the ESA. Failure to implement this ESMC can lead to violation of the ESA.

Project Description

The proposed action is the implementation of the INRMP and the appended RCW ESMC. This document is intended to provide Department of Defense (DoD) installations the ability to implement landscape-level management of their natural resources in coordination with military training. The INRMP and RCW ESMC cover the current military training and land management missions on the Installation, however, they do not cover project-level activities supporting missions on the Installation, such as construction of roads, buildings, firing ranges, other facilities, or changes in military training. As necessary, these activities are addressed in action-specific consultations with the Service.

Military Training

The Installation's military activities include, but are not limited to: training entry-level Infantry and Armor Soldiers, Airborne and Ranger training, hosting the Western Hemisphere Institute for Security Cooperation and the Noncommissioned Officer Academy, and providing a projection platform for rapid deployment. The Installation also supports tenant units that include the 3rd Armor Brigade Combat Team, 3rd Infantry Division (mechanized) (who were ordered to become an Infantry Brigade Combat Team by September 2015 and will no longer train in tracked vehicles on the Installation), 3rd Battalion 75th Ranger Regiment, Regimental Special Troops Battalion, and the 75th Ranger regimental headquarters. In total, roughly 14,000 soldiers reside on the Installation.

The Installation has numerous ranges; eight can accommodate weapons fire from mechanized vehicles and ten impact areas that can accommodate a variety of munitions. Non-vegetated areas include bivouac sites, landing strips and pads for fixed-wing aircraft and helicopters, and drop zones for airborne training. Live firing of weapons is conducted regularly for qualification and sustainment of combat skills. Weapons and weapon systems firing on the Installation include small arms, machine guns, grenade launchers, hand grenades, anti-armor weapons, mortars, mines, artillery, tanks, fighting vehicles, helicopters, and Air Force tactical aircraft.

There are 86 ranges designed to support training on the Installation. Most ranges accommodate multiple weapons systems and firing scenarios. Live fire areas are characterized by target areas, impact areas for inert munitions, surface danger zones (SDZ), and permanent dud areas. Most of the remaining training areas are available for maneuver training. Some areas are dedicated to specific training activities including land navigation, airborne drop zones, aircraft landing strips, and individual tactical training exercises.

Specific Military Project Components include:

<u>Heavy Maneuver Training Areas</u>
The training activities in these areas include maneuvering tracked vehicles with limited off-road and cross-country training. Mechanized infantry and tank units are limited to the areas where the terrain is suitable for heavy vehicle movement. The general characteristics of a heavy training area are relatively flat and open terrain with limited natural obstacles (such as creeks and thickly forested areas). Land coded for heavy maneuver training can be used by mounted and dismounted forces.

<u>Light Maneuver Training Areas</u>
Light maneuver training areas are used for several types of training that do not involve heavy mechanized equipment. Most training activities consist of personnel movement through wooded and open areas, moving wheeled vehicles over dirt and gravel roads, and establishing bivouac sites. Many courses involve Soldiers on foot for navigation, survival, observation, offensive and defensive operations or similar training.

Ranges

The Installation has ranges to accommodate small arms from .22 caliber to .50 caliber firearms. Large caliber weapons are those above .50 caliber such as 120 mm tank rounds, 60 mm mortar rounds, and 155 mm artillery rounds. Ranges support basic and advanced marksmanship, sniper, missile, mounted direct-fire gunnery, collective (two man to platoon) live-fire, firing points for mortars and field artillery, shoot-houses for urban assault, and special live-fire ranges for training with grenades or explosive ordnance.

Drop Zones and Landing Zones

To support airborne and air assault training operations, drop zones and landing zones must be maintained to provide a place for parachutists and helicopters to land. These zones are cleared of trees and other vertical hazards to allow for the safe landing of troops and equipment.

Dudded and Non-Dudded Impact Areas

A dudded impact area has designated boundaries within which all dud-producing ordnance will detonate or impact. The area may include vehicle bodies that serve as targets for artillery/mortar indirect fire and direct fire. Dudded impact areas containing unexploded ordnance may not be used for maneuver. Non-dudded impact areas are areas having designated boundaries within which ordnance that does not produce duds will impact. This area is composed mostly of safety fans and is used for small arms ranges. These impact areas may be used for maneuver when the small arms complex is not being utilized. Impact areas and ranges also have “beaten areas”. Obtaining environmental effects data for these areas is difficult, therefore; it is not until ranges have a firing history that the true effects can be known. Any beaten area data that is required prior to this is calculated using the best technical methods available at the time. The beaten area is estimated based on several factors including but not limited to; location of the range project, the type and quantity of munitions planned to be fired, Line of Site analysis, vegetation type and surrounding terrain.

Cantonment Areas

Lands that are not used for operational training are used to support cantonment functions. The cantonment areas are developed into a wide variety of land uses that comprise the elements necessary for a complete urban-style community as well as military training and support (e.g. classrooms, physical training facilities, and barracks). There are four cantonment areas within the Installation boundaries: Main Post, Sand Hill, Kelley Hill and Harmony Church.

Forest Management

The overall pine forest management objective is to produce and maintain uneven-aged pine and maintain pine-hardwood forests, on all manageable acres. Currently, about 43% percent (79,093 acres) of the Installation’s pine and pine-hardwood stands contribute to the Installation’s managed RCW habitat. The target pine BA range for all clusters is between 50-80 ft^2/acre. Cutting cycles strive to re-enter stands every 10-years, recognizing that timetables for entry into a compartment may be altered from time to time (e.g., RCW activity, recruitment cluster placement, etc).

The three major pine regeneration methods are:

Single Tree Selection
This is the preferred method for healthy loblolly and shortleaf stands, and is considered in mixed pine stands (loblolly, shortleaf, and longleaf). In mixed stands, single tree selection favors longleaf pine. Once longleaf becomes the dominant stand species, the group selection method discussed below is utilized.

Group Selection Method
This is the preferred method for longleaf pine regeneration. Less than thirty-one percent of the Installations pine forests are longleaf dominated (47,286 acres), including all longleaf pine plantations. These forest stands are regenerated through group selection by creating 1/4 to 2-acre openings. The cumulative total area of openings is determined by dividing the total stand acreage by the number of 10-year age classes in the stand. These regeneration patches are protected during timber thinning operations.

Clearcut Method
This method is used to convert stands with off-site pine species (mainly loblolly and slash) back to longleaf pine. Any longleaf in these stands are left. Generally, clearcuts are limited to 40-acres and are only used to convert off-site pine to longleaf pine. Clearcuts near active or recruitment clusters are no larger than 25 acres, and use of smaller patches are preferred. Clearcuts as large as 80 acres are permissible if they are at least 1 mile from active or recruitment clusters and have been approved in the Installation's timber prescription process. All sites are artificially regenerated with longleaf pine unless sufficient longleaf seed trees are available to provide natural regeneration. Diameter cutting limits are set in active and recruitment clusters to provide an abundance of potential nest trees. Timber harvesting in active clusters is prohibited from April 1st through July 31st unless authorized by an Installation RCW biologist. If these standards cannot be met, the Installation should consult as necessary with the Service.

Sanitation Harvests

In the past decade, southern pine beetle (SPB) has not been a significant problem on the Installation. Southern pine beetle may become more active in the future due to extremities in weather conditions and other environmental factors. The following methods/guidelines will be applied inside and immediately adjacent to active RCW clusters:

Cut and Remove Method
This method is used in all cases when access is available. Conventional logging equipment is used to remove the infested trees and possibly a narrow buffer of un-infested green trees to prevent further spread. Log limbing and loading will occur outside of the 200-foot buffers of active RCW clusters unless authorized by an RCW biologist. Trees to be cut inside active clusters and recruitment clusters will be inspected for RCW cavities that may be unknown at the time of the cutting, and then they can be marked for removal. However, no RCW cavity trees will be cut without prior consultation with the Service. Active clusters and recruitment clusters receive top priority for SPB treatments. The "active heads" of the spread are cut first to prevent further spread. Cavity trees that are cut are replaced with an artificial cavity within 12 hours.

Cut and Leave Method
This method is used in spots where access is restricted or when tree removal efforts cannot be expedited. Infested trees are felled toward the center of the infested spot and away from cavity trees. Such activities will be done in consultation with the Service if they may affect RCWs.

Storm Damage
All timber salvage operations in response to catastrophic storm events adhere to Best Management Practices for Forestry to include:
a.) All storm damaged areas are delineated and reviewed under the NEPA process.
b.) Only standing trees are marked for salvage with timber marking paint.
c.) Salvage operations occurring within RCW partitions are only treated under the guidance/approval of an Installation RCW biologist, forester and Army Corps of Engineer (ACOE) forester.
d.) Salvage occurring within the 200 foot RCW cluster boundary during nesting season (April 1st – July 31st) is allowed only with the approval of the Service and should be overseen by an Installation RCW biologist, forester and ACOE forester. In addition, all three representatives should be on-site during the salvage operations.

Wildfires
Wildfires are allowed to burn whenever feasible, but suppression is often necessary to protect personnel and facilities, to avoid unacceptable smoke management risks, and to protect RCW cavity trees or other sensitive habitats. When weather conditions are unusually dry or windy, suppression may also be necessary to protect timber resources, although silvicultural practices and existing stand conditions (e.g., reestablishment of longleaf, reduced stocking density, frequent prescribed burning to reduce fuels) may minimize the need for fire suppression.

Conservation Measures

Conservation measures are actions to benefit or promote the recovery of listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant, and serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document.

Re-Delineation of RCW Habitat Management Units (HMU)
The Installation is proposing to be divided into 4 HMUs (previous ESMP was divided into 6 HMUs). As defined in the 2007 Army Guidelines, RCW Habitat Management Units are;

"Designated area(s) managed for RCW nesting and foraging, including clusters and areas determined to be appropriate for population maintenance and recruitment".

The total acreage in RCW management for all of the HMUs is approximately 79,138 acres; of which 64,720 acres is either current or potential habitat and 14,418 acres is future habitat.

HMU-1

HMU-1 includes some or all of the following training compartments: A01, A02, A03, A04, A05, A06, A07, A08, A09, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A27, A28, A29, A30, AA03, AA04, D02, D03, D04, D05, D06, D07, D08, K01, K02, K03, K04, K05, K06, K07, K09, K10, K11, K12, K13, K14, K16, K17, K19, K20, K21, K24, K25, K26, K27, K28, K29, K31, K34, K35, K36, K37, L09, L10, M01, M02, M06, M07, O08, O09, O17, O18, O19, O20, O21, O22, O23, O24, O27, O28, O29, O30, O31, O32, O33, O34 along with forested portions of Brooks, Cactus, Caramouche, DMPRC, Griswold, Ruth and Ware Ranges.

This HMU contains 185 clusters of which, 184 are active and one is inactive. In total, this area accounts for 30,084 acres. The defining characteristic of this HMU is that it encompasses all the ranges, their non-dudded impact areas and dudded impact areas. The RCW groups in these areas are demographically stable and dispersal between them has been noted regularly by Installation staff. The main objective for HMU-1 is to maintain and manage existing clusters to the maximum degree that available access allows.

The Installation acknowledges that all ongoing A20 monitoring will be maintained in appropriate clusters as outlined in the A20 Red-cockaded Woodpecker Management Plan. There is minimal non-range training in these areas as the majority of the area is the A20 impact area and the adjacent compartments are often covered by SDZs. There is minimal activity that consists mostly of reconnaissance and dismounted training/foot traffic. The Installation reports that the main issue in the A20 SDZ area is access challenges. The establishment of recruitment clusters within this HMU will be necessary in order to reach the Installation RCW population goal.

HMU-2

This HMU covers all or portions of the following training compartments: A01, AA01, AA02, AA03, AA04, AA05, all BB compartments, all C compartments, D01, D02, D03, D06, D07, D08, D09, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, all E compartments, all F compartments, all G compartments, all H compartments, all I compartments, all J compartments, K02, K04, K07, K08, K09, K16, K17, K18, K19, K20, K21, K22, K23, K24, K25, K26, K29, K30, K31, K32, K33, K34, K35, L01, L02, L03, L04, L05, L06, L07, L08, L09, M01, M02, M03, M04, M05, M07, all N compartments, all O compartments, all P compartments, all Q compartments, all R compartments, all S compartments, all T compartments, and all U compartments.

This HMU contains 183 clusters: 176 active, 7 inactive and contains approximately 44,315 acres. The groups occupying these clusters are demographically stable and dispersal between these clusters has also been noted on a regular basis. The main objective for HMU-2 will be to expand the population to further increase the opportunities for birds to disperse between and among territories/clusters, creating better connectivity. Upon approval of this ESMC, recruitment clusters will be added to this area as “unprotected clusters” (UCs) and will be placed in areas that are more important or critical to the training mission.

HMU-3
Fort Benning's boundary occupies land in both Georgia and Alabama with the Chattahoochee River separating the two states. The Alabama compartments are proposed to make up HMU-3. There is currently one historically inactive cluster that is no longer managed and no active clusters in this HMU. This HMU contains approximately 3,202 acres. Dismounted/Mounted training and several landing strips and drop zones are in this HMU. This area is essential for any possible connections to off-post RCWs to the south and west.

HMU-4
This HMU includes the Sand Hill and Harmony Church Cantonment areas. Currently, there are 4 active clusters and 2 inactive clusters in this area and it contains approximately 1,537 acres. Portions of this HMU may require more extensive mechanical control of hardwood and understory due to its proximity to smoke sensitive areas that inhibit the ability to consistently maintain the habitat with prescribed fire.

The K15 dudded impact area is not placed into an HMU as the area is not manageable. However, there is suitable habitat in this area and RCW clusters have been documented. Although this area may provide some local demographic stability, it unfortunately cannot be actively managed for RCWs. Incidental Take will be required for clusters in this impact area; as of 2009, 4 active clusters were documented in K15 via an aerial survey.

The RCW Recovery Plan lists eight primary management techniques for attaining a sustainable forest and managing a viable population, they are: (1) population monitoring, (2) cavity management: artificial cavities and restrictor plates, (3) predator and cavity kleptoparasite control, (4) translocation, (5) silviculture, (6) prescribed burning, (7) habitat restoration, and (8) ecosystem management. To date, management techniques 1 through 7 have been the most common techniques used to manage the Installation and act as conservation measures used to protect and grow the population. In the following section the Service will highlight only those measures that are related to the issues in which incidental take are proposed. All other conservation measures proposed in the ESMC are assumed to be implemented by the Installation as they are considered part of the proposed action and non-discretionary (as such, they will not be reiterated in the Reasonable and Prudent Measures section).

<u>RCW Management</u>
Recruitment Clusters - The Installation's RCW population must continue to be increased in order to reach its population goal of 351 potential breeding groups (PBGs). In order to attain 351 PBGs, 382 manageable clusters will need to be on the landscape. The additional 31 clusters accounts for the probability or likelihood that a proportion of clusters will not have a PBG as they are likely to be either inactive, captured by an adjacent group, or occupied by only a single bird (e.g., non-PBG). The proportion of managed clusters required to attain 351 PBGs will be reduce over time as populations expand and PBGs proportionately occupy more territories than those that are inactive, captured, or remain as single bird groups.

Prior to this ESMC, the estimate for the number of managed cluster's need to attain 351 PBGs was 421. Based on demographic analysis from 2009 through 2013, the total number of clusters needed on the landscape to attain 351 PBGs is 382. As the RCW population grows, bird's will

either voluntarily move into territories not previously occupied, or they will occupy recruitment clusters that are artificially created by Installation biologists. These recruitment clusters are placed in the appropriate locations throughout the Installation based on the overall structure and function of the current cluster locations. Recently, artificial recruitment cluster placement has been slowed due to the limited availability of contiguous pine habitat and because the limits of the current cluster distances and aggregations approximate to the next nearest active cluster(s). However, the 2009 through 2013 monitoring data reveals that the Installation's percent of managed clusters with PBGs has averaged 92%, which is consistent with regional datasets for populations of similar size.

Upon approval of this ESMC, the Installation will implement the 2007 Management Guidelines for the RCW on Army Installations, which will supersede the 1996 Management Guidelines for the RCW on Army Installations. Once approved, the Installation would then be able to establish "Protected Clusters (PC) and Unprotected Clusters (UC)." By definition, UCs are not subject to training restrictions identified in the 2007 Guidelines, but they are still subject to guidance for certain activities listed in sections of the 2007 Guidelines (e.g., V.C, and V.C.5). Protected clusters are subject to training restrictions. Together, both UCs and PCs are managed to promote RCW population expansion.

RCW Habitat Management

The Service's guidelines for the management of foraging habitat are based on habitat quality and quantity. Creating and maintaining good quality foraging habitat (GQFH) is one of the most critical aspect of RCW management and recovery. Our understanding of what constitutes GQFH comes from a synthesis of research that reflects the selection of foraging habitat and effects of habitat characteristics on group fitness.

Foraging habitat is assessed using both the Managed Stability Standard (MSS) and the Recovery Standard (RS). The MSS is also used as the threshold for Incidental Take associated with habitat loss; therefore, all projects/ actions impacting RCW habitat must include the measures of the MSS criteria. The Service considers timber harvesting within a RCW partition as an action and therefore must also be measured against the MSS criteria. Given that the Installation is a Primary Core Recovery Population for RCWs, foraging partitions must also be analyzed using the RS in order to confirm that each cluster has the potential to meet RS in the future. The MSS requires a minimum of 3,000 square ft. (ft^2) of pine BA in stems >10 in. DBH on at least 75 acres of good quality foraging habitat contiguous to the cluster as defined below:

a. Pine stands must be at least 30 years of age or older.
b. Average BA of pines ≥ 10 in. DBH must be between 40 and 70 ft^2/acre.
c. Average BA of pines < 10 in. DBH must be less than 20 ft^2/acre.
d. If a hardwood midstory is present, it must be sparse and less than 7 ft. in height.
e. Total stand BA, including overstory hardwoods, must be less than 80 ft^2/acre.

Additionally, the Service has established the following clarification of the total stand BA requirement:

- Overstory hardwood BA must be ≤10 ft^2/ acre (longleaf).

• Total stand BA can exceed 80 ft^2/ acre if the maximum limits for overstory hardwood and pines <10 in. DBH are not exceeded, and the BA in pines 10-14 in. DBH is 40-70 ft^2/acre (in other words, the excess in BA is comprised of pines ≥14 in. diameter breast height (DBH).).
• In addition to low and sparse hardwood midstory being suitable (criteria d. above), sparse-medium and sparse-tall midstory is also considered to be suitable. This modification is suitable as long as there is data to support stability and breeding success of the resident RCW group(s).

The Service recognizes however, that individual RCW populations can become adapted to local environmental conditions and may differ from what is characterized by the range-wide MSS. As such, the Service provides RCW biologists and land managers the ability to develop population specific criteria that better reflects local adaptations.

The Services' 2003 RCW Guidelines also recognize that some sites may not currently, or ever, meet the MSS because of catastrophic events, past land use history or ecological reasons. In cases where birds have adapted to conditions that do not meet the MSS, making a take determination based solely on the MSS may not always reflect the use of the best scientific information available. There may be cases where a cluster does not meet the MSS criteria, yet no Incidental Take Statement is issued.

Red-cockaded woodpecker managers who wish to develop population-specific guidelines must demonstrate, through sound science, that multiple generations of birds have been stable under the current site conditions. Demographic data must also show that group fitness has not diminished as a result of insufficient habitat, and preferably establish a threshold where habitat quantity and/ or quality does begin to adversely affect group fitness. Other than age and acres (75), the only minimum criteria for stand suitability in the MSS is the BA in pines ≥10 in. DBH; all other criteria are maximum values that could be improved with management. Therefore, in most cases, if a stand meets the BA in pines ≥10 in. DBH criteria, it would be classified as either suitable or potentially suitable habitat.

During the Transformation - BRAC/MCoE consultation, a revised MSS for the Installation was authorized. The revised MSS was supported by 10-years of demographic data that was collected and assessed. Although somewhat small in sample size, the clusters were reasonably distributed across the Installation. Following through with that assessment, and as of this consultation, Fort Benning proposes to establish this revised standard for the entire Installation and last for the term of this ESMC.

The Installation's revised MSS is proposed as the Fort Benning Managed Stability Standard (FBMSS). In effect, the Installation proposes modification from 40 ft^2 BA/acre to 30 ft^2 BA/acre. Using the FBMSS, all MSS criteria as listed in the RCW Recovery Plan and above must be met, except that the acceptable BA range for pines ≥10 in. DBH is modified to include stands with an average BA of ≥ 30 ft^2/acre versus 40ft^2/acre. The minimum acreage required is directly correlated to the average BA of stands within the partition. Partitions containing stands with BA of 40 ft^2/ acre will still require a minimum of 75 acres, however, partitions averaging 30 ft^2/ acre BA would require 100 acres to meet the minimum of 3,000 ft^2 total BA.

In FBMSS deficient partitions, forest management actions are limited within ½ mile of a cluster center (up to 502 acres per cluster). Within a deficient partition, pine trees ≥10 in. DBH [within suitable stands] cannot be harvested regardless of tree health, pine species, or tree density. If a ≥10 in. DBH pine tree is harvested, the action could result in Incidental Take by increasing the deficient number of ≥10 in. DBH pine stems.

The Installation reports that diminishing tree health of ≥10 in. DBH pine stems is a concern within deficient partitions, and therefore passive forest management is the only alternative for these diameter classes of pine trees. The vigor of the off-site/ stressed pine overstory will set the timing and be a determining factor for other forest restoration actions that will need to occur, such as mechanical vegetation removal, hand felling, and/or chemical site preparation and longleaf pine under-planting feasibility that would facilitate successful establishment. Passive management of the mature pine overstory allows off-site pines to reduce the overstory pine BA to a feasible under-planting density where longleaf pine under-planting efforts can be successful.

Conversely, in partitions that meet the FBMSS, forest management is allowed more flexibility; although, "flexibility" is still contingent upon ≥10 in. DBH pine BA and acres above the FBMSS minimum requirements. As the Installation continues upland pine restoration to transition off-site pines to a longleaf pine-dominated forest, forest management practices should adhere to the current FBMSS until new alternatives are negotiated with the Service.

Note: *While Incidental Take for habitat related actions is not issued until an action is introduced and the habitat is already below or will be brought below the FBMSS, recovery populations have a responsibility to manage toward the RS, and must ultimately meet the RS in order to meet one of the recovery criteria. Since the Installation is a Primary Core Recovery Population, foraging habitat impacts will also be assessed using the RS, both for current suitability and the ability of each cluster to reach the RS in the future. The RS is commonly referred to as the "desired future condition" of RCW habitat.*

Digital Multi-Purpose Range Complex (DMPRC) Monitoring

In the July 22, 2004 DMPRC BO, the Service identified as a Reasonable and Prudent Measure and Term and Condition the need to develop and implement a habitat monitoring plan. The Plans purpose was to detect early warning signs of potential cluster abandonment and/or habitat degradation among 8 groups that were within 0.5 miles of the Range footprint. The Plan would also require the same level of observation among 5 clusters that were within the Range's Surface Danger Zone. In addition to standard demographic monitoring for all affected groups, determination of specific home range and dispersal movements were required.

The Installation's monitoring results during the timber harvest, construction, and military training phases showed Cluster (D13-01) (currently known as cluster DRC-A) became active with a breeding pair (this became the 8th cluster/group to receive incidental take). Taken cluster D14-04 went inactive in 2005 and was later deleted in 2010 (this was to be expected since a significant amount of habitat was lost due to the timber harvest/land clearing, an estimated 1/2 to 2/3 of habitat was lost). No clusters other than D14-04 have gone inactive due to timber harvesting, construction and/or training. Cluster J06-01b (currently known as DRC-D) was

pioneered/discovered in 2009, and has been intermittently active since discovery and is currently considered captured by group J06-1a (currently known as DRC-C).

RCW home range locations, shapes and sizes during the RCW non-breeding season are estimated using RCW foraging location data (i.e. GPS information collected in the field) and a Fixed Kernel Density Estimator GIS application. Home ranges appear to range significantly among groups. Home range estimates during the timber harvest and construction phases (2004 to 2010) ranged from 120.4 to 267 acres. The Installation reports that final home range estimates during the operational phase will be complete in December 2015.

All suitable habitat within 0.25 miles of the DMPRC boundary has been surveyed at least twice per year for damage resulting from munitions impacts. Results from the surveys indicate that the an estimated 81% of the bullet strikes discovered since the operational phase began are located in a pine stand inside the Range footprint (non-manageable pine) near the boundary of training areas K37, D04 and the K15 Impact Area; whereas 19% of bullet strikes were discovered within 0.25 mi of the south side of DMPRC boundary within training areas D04 and K37. All bullet strikes found in pine stands in D04 and K37 are reported to be the result of small arms fire. No training impacts have been found within any of the clusters being monitored within 0.5 miles of the Range.

Habitat Impact Assessment Plans for Transformation/BRAC and MCoE

The Service identified as Reasonable and Prudent Measures and Terms and Conditions in the 2007 Transformation/BRAC BO and the May 2009 MCoE BO for the Installation to devise and implement a habitat monitoring strategy for clusters that may be impacted by 15 new small arms ranges in the northwest corner of the Installation. The Plan is designed to assess and monitor the impacts to “down-range” clusters and habitat resulting from small arms munitions training in the newly constructed Oscar Range Complex. Specifically, the plan attempts to assess the effectiveness of full and partial toe-berms constructed on Oscar Ranges 1-5. The berms were designed to protect RCW habitat. The Plan was also designed to examine the projected limits of munitions damage to down-range habitat from non-bermed Ranges.

A detailed assessment of forest habitat downrange was conducted for Oscar 2 (Call), 3 (Copple), and 4 (Davis) in 2011. Two hundred and forty eight long-term vegetation plots were established and surveyed to assess baseline forest stand condition prior to training. Plot data are being analyzed at the Construction Engineering Research Laboratory (CERL) to provide baseline forest stand conditions from which future plot sampling data will be compared.

Acoustics were used in attempt to verify and quantify potential bullet overshot/ ricochets at Oscar Ranges 2, 3, and 4 of four downrange clusters during the 2012-2013 nesting seasons. Data from these recordings are intended to provide detailed information that verifies the number of rounds fired, timing of range activity, evidence and quantification of bullet overshot/ricochet into downrange habitat, frequency spectra of bullet noise, and bullet fate (i.e., relative landing zone of bullets on/off range). Over 495 hours of sound data were recorded in 2012. This increased substantially in 2013, with more than 2,655 hours of recordings within the Range Complex due to the use of remote automated monitoring systems, which allowed for continuous recordings. All acoustical data are being analyzed at USACE CERL to relate RCW response to small arms

live-fire training events, and to better understand how bullet overshot/ricochets might impact or degrade downrange foraging habitat over time.

Although some bullet strikes to cavity trees have been detected (cluster O30-A) to date within the 200 foot buffer, most (although few) have been detected within foraging partitions. Currently, the Army is conducting a biological assessment of bullet strikes to trees within the .5 mile RCW foraging partitions to evaluate potential effects that were not considered in previous consultations.

Effects Monitoring of Heavy Maneuver Training

In May 2009, MCoE consultation with the Service identified as a Reasonable and Prudent Measure and Term and Condition the need to develop and implement a monitoring plan that would quantify and compare the response of RCWs subjected to heavy maneuver effects to those that are not. The *Monitoring Plan to Evaluate Effects of Heavy Maneuver Training on the Red-cockaded Woodpecker Population on Fort Benning, Georgia* was developed to meet these requirements and implementation of the monitoring plan was initiated in 2010. The primary objective of the monitoring effort was to document whether heavy maneuver training associated with MCoE activities affects the RCW population and its habitats in the Southern and Northern Maneuver Areas.

A total of 32 RCW clusters were monitored for vehicle activity with trail cameras from 2010-13, recording a total of 1,532,191 images (i.e., encompassing vehicles and non-vehicle events) across 3,748 camera trap days of coverage during this period.

To date, no heavy maneuver training has occurred in the NMTA and no heavy maneuver training by the ARC has ever occurred in the SMTA. Therefore, as designed, the monitoring plan component designed to quantify and compare the response of RCWs subjected to the additional Armor School heavy maneuver effects has not yet occurred. However, once all of the collected data is analyzed, comparisons of RCW responses should be able to be made. Comparisons should include those examining groups subjected to loss of habitat, as well as those disturbances originating from the construction activities. Comparisons should further examine changes in vehicular traffic for all vehicle types utilizing the improved roadways in both the SMTA and NMTA.

The original study design of monitoring potential disturbance resulting from ARC training shifted away from monitoring heavy maneuver training using tracked vehicles in a small confined area (referring to the three interconnected “fingers” of corridors comprising the SMTA) to monitoring light maneuver training of wheeled vehicles over larger training areas, therefore, changes to the monitoring approach occurred.

Following a Conservation Recommendation from the Service’s 2007 consultation, the Army began attaching Global Positioning System (GPS) tracking devices to nearly all vehicles used during each ARC class (approximately 20 vehicles) that occurred during the nesting season beginning in 2012. These devices are set to record precise spatial and temporal data for nearly all vehicular movement associated with field activities for the “Goldeneye” and “Blackjack” phase of each ARC class. Although final reports are pending, all GPS tracking data has been analyzed

at CERL in conjunction with the CB's summary analysis of the demographic data for those groups where ARC vehicles traveled within 200 feet or less of an active cavity tree.

Multi-Purpose Training Range Monitoring

A Multi-Purpose Training Range was originally proposed for construction to the north of, and overlapping, Hastings Range as part of the MCoE consultation. During the consultation, the Army reexamined its options and determined that it could fulfill the minimum training requirements by refurbishing the Range (~1,685-acre range). The consultation concluded that the only changes from the current use of the Range would be the frequency and duration of training events; the target locations, firing points and types of ammunition used would not change. During the final design development, however, it was realized that minor changes to the target locations and firing positions would be necessary. The target positions and firing points had to change in order to meet the current training standards. The Installation concluded in their July 2010 Biological Evaluation that these changes may affect, but were not likely to adversely affect, the RCW or surrounding habitat, and the Service concurred. The Installation developed a monitoring plan as a minimization measure in order to validate the conclusion.

The RCW Monitoring Plan for the Range addresses procedures designed to assess and monitor potential impacts to down-range clusters and habitat that could result from upgrading the existing Range. Video surveillance and acoustical recording equipment were used to evaluate the potential effects of large caliber weapons on nesting. A total of 11 clusters were monitored for a total of 499 camera days with video cameras from 2011-13, recording over 9,782 hours of nesting behavior. In 2011, 7 clusters were monitored for a total of 217 camera days, recording over 3,432 hours of RCW nesting behavior. Clusters were monitored for 29 days in 2012 through recordings of over 644 hours of nesting and non-nesting behavior. In 2013, a total of 6 clusters were videotaped for 253 camera days, recording over 5,705 hours of nesting and non-nesting behavior. Video surveillance data are currently being analyzed at U.S. Army CERL to see if there is a relationship between RCW responses to large caliber live-fire training events from the MPTR.

To date, some tree damage from large caliber weapons firing have been detected during ground surveys. The results from those surveys have been specified in the Installation's monitoring reports. Both occurrences happened within the 200 foot buffer of a cluster and both resulted in the closure of the suspected target/mover. No downrange munitions impacts have been detected since the last targets were closed.

Alpha 20 (A20) Impact Area Management Plan

As a result of the MCoE consultation, the Reasonable and Prudent Alternative (to the jeopardy finding), is that 36 clusters in A20 will be added to management. Previous to the MCoE jeopardy finding, these groups were not included and therefore counted towards the Installation's management/recovery goal (i.e., they previously had incidental take coverage). The conditions of the RPA included the requirement of an A20-centric Management Plan. The Plan identifies 50 potential clusters that can be managed towards the Installation's population recovery goal. Every spring, all accessible A20 dudded impact area clusters are inspected for activity and tracked to determine breeding status. Breeding status is only followed up until such time as 36 PGBs are identified. Thus, the clusters that count towards the goal may vary from year to year.

Management needs are also identified including cavity maintenance to achieve 4 suitable cavities per cluster, prescribed burning or herbicide requirements, and trail maintenance. The A20 dudded impact area is accessed during the following fall/winter in order to accomplish any habitat management needs identified during the spring inspections. Since its implementation in 2010, the Installation has documented 36 PBGs per year and has been able to assure 4 suitable cavities per cluster.

Training Restrictions

As stated previously, upon Service approval of this ESMC, training restrictions should be implemented in accordance with the 2007 Army Guidelines. Training restrictions for the RCW will apply to all clusters except those designated as UCs. Current SRCs will be converted to UCs and will remain invisible to training as defined in the 2007 RCW Guidelines. As new cavity trees (natural or artificial) are added to existing PCs in the future, they will also be subject to training restrictions. Training restrictions will not apply to UCs as defined in the 2007 RCW Guidelines, or to any new cavity trees associated with them. The 2007 Army RCW Guidelines allow for Installations to systematically remove boundaries/training restrictions from protected clusters as certain PBG goals are met. Installations with less than or equal to 250 PGBs will maintain the current number of protected clusters for both active clusters and recruitment clusters.

Installations with populations greater than 250 PBGs may remove training restrictions from clusters. It should be noted designating clusters unprotected via the process described in the 2007 Army Guidelines is complicated by the amount of incidental take that has been authorized via the DMPRC, BRAC and MCoE consultations. Even though there are currently 343 PBGs, when the taken clusters are subtracted from this total, 246 remain. Therefore, the Installation should not begin designating new UCs and removing restrictions until the 250 PBGs threshold is met. Once this goal is met and training restrictions begin to be lifted, no cluster currently covered under an incidental take statement will be considered for UC status until such time as the incidental take statement is removed, the exception being SRCs which will become UCs.

Designating RCW Clusters as Unprotected Clusters

This ESMC is designed to factor RCW management into the Installation training mission, and to factor the training mission into RCW management. The kind of open forest preferred by the RCW is also conducive to military training. Fort Benning's size will make it possible to support military training and still have adequate forest to support a recovered RCW population. Potential conflicts arise when training restrictions are imposed and when military training standards require large open areas. The implementation of this ESMC will seek to minimize conflict by establishing UCs where RCW habitat is good and training may be incompatible. Red-cockaded woodpeckers appear to be tolerant of noise and military activity, as evidenced by the numerous active clusters adjacent to roads and ranges (see Delaney et al. 2011). The main concern then is the nesting season, when prolonged activity near a nest tree may cause the adults to abandon the nest.

Unprotected clusters can support RCWs, even if they are only a few hundred meters from a frequently used tank trail or range. Unprotected clusters are invisible to training. They are not marked with the standard white bands and signs. They are not subject to training restrictions but

they do require incidental take protection from the Service. Habitat management will be the same for all clusters. However, if it is necessary to convert forestland to non-forest use in order to support training mission requirements (e.g., new drop zones, firing ranges, maneuver areas, etc.), habitat for any unprotected cluster may be reduced or eliminated. In such cases, the Service will be notified, and if necessary, efforts will be made to provision suitable adjacent habitat with artificial cavities to minimize any impact on the group(s) in question. If the action reduces the Installation's RCW carrying capacity, the ESMC will be modified to reflect the proposed reduction.

Surveys, Inspections, Monitoring and Biological Assessments

Implementing the effectiveness of this ESMC will be monitored by both the Service and the Installation. The Installation will consult with the Service for all proposed actions (construction or other significant land disturbing activity) that may affect RCWs (or other federally listed species) and that are beyond the scope of this consultation. Surveys for all species potentially affected should be conducted as necessary to support consultation. When conducting monitoring activities, efforts should be made to minimize disturbance of the species being monitored. Prior to any timber harvest or other significant land disturbing activity, personnel trained and experienced in RCW survey techniques should conduct a 100% survey of the affected area and the area within a 1/2 mile radius of the project area. Foraging habitat analyses (FHAs) will be conducted for projects that remove foraging habitat from active clusters and will be evaluated in alignment with the standards determined in the Recovery Plan. Every cluster should be inspected annually. Inspections should be conducted in March - April. Data recorded should include, but are not limited to: hardwood midstory density, condition of cavity trees and cavities, activity status of each cavity, presence/absence of PBGs, description of any damage from training activity (tree damage, digging, CS or smoke canisters, etc.), fire, wind, erosion or kudzu problems, insect or disease problems, general stand management recommendations, and the location and status of any newly discovered cavity trees. Recommendations for remedial measures should be included whenever necessary. All recruitment clusters should also be inspected in the fall (September - October) and a 100 percent survey for new clusters should be conducted every 10 years in all suitable stands. Ten percent should be surveyed on an annual basis so that all suitable habitat will be surveyed every 10 years. These surveys should be conducted by persons knowledgeable of RCW habitat and should follow the survey techniques outlined in the Recovery Plan. New trees that are found should be marked and cluster boundaries should be adjusted, except for those trees found in UCs.

Status of midstory on the Installation should be captured through the 10 year forest inventory and yearly cluster evaluations. The Installation is proposing that the additional 5-year midstory surveys proposed by the Service are not necessary given the level of habitat evaluations already in place coupled with the three year burn rotation.

The Installation began RCW population monitoring in 1994. A total of 34 randomly selected active clusters were monitored through the 1996 nesting season. The sample was increased to 64 to comply with the 1996 Army Guidelines and they continued to monitor these clusters through the 2013 breeding season. The Installation will continue to monitor a 25% sample, stratified by protected and unprotected clusters and excluding clusters active for fewer than 3-years as required in the 2007 RCW Guidelines. Additionally, all clusters that have incidental take or are

required to be monitored by other consultations should continue to be monitored. The total number of clusters being monitored is 260, or 68% of all clusters. The Installation should also continue to determine breeding status of all non-banding clusters (depending on availability of resources).

During the nesting season, all active clusters should be visited every 7-10 days to check for nesting activity. Suspected nest trees should be climbed or inspected to confirm presence of an RCW nest. All nests should be monitored to determine success (defined by at least 1 nestling fledged from the nest). Each group should be monitored to determine number of adults, number of eggs, number and sex of fledglings, number of nests (i.e., re-nesting attempts), and number of breeding groups (i.e., budding into 2 clusters). Fledglings should be counted as soon as possible after the projected fledging date. Birds from a 25% sample of active clusters should be banded. This sample set should be randomly selected and should be maintained for monitoring purposes.

As the Installation's RCW population increases, clusters should be added to maintain at least a 25% sample of active clusters. The clusters to be added should be randomly chosen from all active clusters. All adults and nestlings should be banded with color bands and an aluminum numbered band.

In addition to clusters in the sample set, all recruitment clusters that become active should be monitored for productivity (number of fledglings) for 5-years after they activate. All nestlings and adults in these clusters should be banded. Thereafter, they should be integrated into the standard monitoring program by including them in the pool of clusters from which new sample clusters are randomly selected as the population grows.

Active clusters that do not nest by the end of May should be visited late in the nesting season (June-July) to determine if a PBG is present. Adults may be captured and banded if necessary to make this determination. Survey and monitoring results for all clusters should be recorded and retained permanently, allowing for trend analysis projections. Map location data should be entered into the Installation GIS. Tabular data for trend analysis should be maintained in a database and managed by an RCW biologist.

Monitoring results should be reviewed and analyzed annually. An annual report will be provided to the Service. If an annual analysis shows a population decrease of 5% or more, the Installation Commander will notify the Service and reinitiate consultation within 30 days. The Installation will conduct a review of available data in an attempt to determine the cause of the decline within 90 days. The Installation, in consultation with the Service, will then develop and implement a plan to prevent further declines. The Installation will enter into informal consultation with Service in accordance with Section 7 of the Endangered Species Act to resolve potential problems and address issues as necessary.

Action Area

For the purpose of consultation under section 7 of the Act, the "action area" is defined at 50 CFR 402 to mean "all areas affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action." For projects impacting RCWs, the action area includes

the RCW neighborhood, which is defined as the area extending beyond the directly impacted area(s) equal to the average dispersal distance within the population or subpopulation (USFWS 2005). Dispersal is the movement of individuals from their natal cluster to their first breeding location, or between consecutive breeding locations (USFWS 2003). Installation RCW dispersal data collected over an 11 year period illustrates an average dispersal distance of 2.57 miles (USACE 2008).

Fort Benning consists of approximately 182,000 acres of Federal land in Georgia and Alabama. About 93 percent of the land and all of the active RCW clusters are in Georgia. The action area, including the Installation and affected adjacent lands are projected at roughly 215,000 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, and Russell County, Alabama.

STATUS OF THE SPECIES

Red-cockaded Woodpecker

The U. S. Department of the Interior identified the RCW as a rare and endangered species in 1968. In 1970, the RCW was officially listed as endangered (Federal Register 35:16047), and, with passage of the Act in 1973, the RCW received the protection afforded species listed under the Act. No critical habitat has been designated for RCWs.

The RCW is a small woodpecker about 8 inches in length, with a wingspan of about 14 inches. An adult weighs about 1.7 ounces. The bird is black and white, with a ladder back, and is distinguished from other woodpeckers by its black capped head and nape, and surrounding large white cheek patches. Adult males possess a tiny red streak or tuft of feathers, the cockade, in the black cap near each ear and white cheek patch. The small cockade usually is covered by the black crown, except when protruded during excitement, and is not readily visible except upon close examination. Adult males and females are not readily distinguishable in the field. Juvenile males have a red crown patch until the first molt, which can be distinguished from the black crown of juvenile females.

Life History

The RCW is a territorial, non-migratory, cooperative breeding species (Lennartz et al. 1987; Walters et al. 1988). It is the only North American woodpecker that exclusively excavates its cavities for roosting and nesting in living pines. Usually, the trees chosen for cavity excavation are infected with a heartwood decaying fungus (*Phellinus pini*) (Jackson 1977; Conner and Locke 1982). The heartwood associated with this fungus is not generally present in longleaf (*Pinus palustris*) and loblolly pine (*Pinus taeda*) until a tree is 90-100 and 75-90 years of age respectively (Clark 1992a; Clark 1992b). Large trees also are required because the cavity is constructed and placed entirely within heartwood where pine resin will not flow. Each group member has its own cavity, although there may be multiple cavities in a cavity tree. RCWs chip bark and maintain resin wells on the bole around the cavity where the fresh flow of sticky resin is a deterrent against predatory snakes (Rudolph et al. 1990) and indicates an active cavity tree. The

aggregate of cavity trees, surrounded by a 200-foot, forested buffer, is called a cluster (Walters 1990). Cavities within a cluster may be complete or under construction (starts) and either active, inactive or abandoned. Clusters with one or more active cavity trees are considered active RCW clusters.

Most RCW populations occur where longleaf pine historically dominated the forest community. Populations in other vegetation types occur in the western, northern interior and southernmost regions flanking the longleaf pine ecosystem. RCWs in the West Gulf Coastal Plain occupy loblolly pine forests in parts of southern Arkansas, east Texas, and Louisiana on flatwood terraces and more dissected upper terraces where loblolly pine was dominant or with shortleaf pine as a natural community type (e.g., Moore and Foti 2005; Moore and Foti 2008). Shortleaf pine-dominated communities currently with RCWs are in portions of the coastal plain in east Texas, the Ouachita Mountains of Arkansas and eastern Oklahoma, the Piedmont and Cumberland Plateau of Alabama, and the Georgia Piedmont. In south Florida, RCWs persist in hydric pine flatwoods dominated by South Florida slash pine (*Pinus elliottii* var. *densa*). In northeastern North Carolina and southeastern Virginia, small populations remain associated with pond pine (*Pinus serotina*) communities and pocosins. However, the fundamental ecology of RCWs remains the same --populations occupy fire-maintained, open pine forests, with pine of sufficient age and size for cavities and foraging.

RCW live in social units called groups. This cooperative unit usually consists of a monogamous breeding pair, offspring of the current year, and 0-4 adult helpers (Walters 1990). Helpers typically are male offspring from previous breeding seasons that assist the breeding pair by incubating eggs, feeding young, excavating cavities, and defending the territory (Ligon 1970, Lennartz and Harlow 1979, Lennartz et al. 1987, Walters et al. 1988). Some large populations infrequently have female helpers (Walters 1990; DeLotelle and Epting 1992; Bowman et al. 1998). Some clusters are only occupied by a single adult male (called single bird groups).

The RCW is territorial and each group defends its home range from adjacent groups (Hooper et al. 1982; Ligon 1970). The defended territory includes cavity trees and foraging habitat. RCWs feed mostly on arthropods, particularly ants and wood roaches, foraging predominately on and under the bark of larger and older living pines. Males tend to forage in crowns and branches, while females commonly forage on the trunk. Dead and dying pines are important temporary sources of prey, and hardwoods are used occasionally. RCWs tend to forage with other group members within 0.5 miles of their cluster.

RCWs have large home ranges relative to body size (86-556 acres; Conner et al. 2001; U.S. Fish and Wildlife Service 2003). Home range size is variable within and between populations, but tends to reflect foraging habitat quantity and quality, boundaries of adjacent RCW territories, and possibly cavity tree resource availability (Conner et al. 2001; U.S. Fish and Wildlife Service 2003). The average RCW home range size tends to be greater at xeric and wet communities or sites in Florida than more productive pine sites in Georgia and South Carolina (Nesbitt et al. 1983; DeLotelle et al. 1987; Epting et al. 1995; Hardesty et al. 1997a). Home range size has been related to the area of suitable habitat within 2 km of the cluster, pine basal area, pine density, pine density greater than 25 cm DBH, RCW group density, hardwood midstory, and other factors (Hooper et al. 1982; DeLotelle et al. 1987; Bowman et al. 1998; Hardesty et al. 1997a; Walters et

al. 2000, 2002b). Variation in home range size reflects a response to habitat quality, where a larger home range is generally required in low quality habitat.

About 90 percent (%) of the breeding pairs in a population nest each year. The nesting season occurs from April to July. Females usually lay 3 or 4 eggs in the cavity of the adult male. The short incubation period lasts approximately 10-12 days, and eggs hatch asynchronously. Nestlings fledge after 24-29 days, although all nestlings rarely survive to fledglings. Partial brood loss of nestlings is common in RCWs, although the number of hatchlings successfully fledged tends to increase with group size. Older and more experienced breeders have greater fledgling success, which maximizes at about 7 years of age, then declines sharply at 9 years of age or older. About 20% of nests will fail completely. Groups with helpers experience whole brood loss less frequently than breeding groups without helpers. Renesting rates are geographically and annually variable. In good years, up to 30% of breeding groups will renest. Productivity of second nesting is lower.

RCWs in southern and coastal RCW populations tend to have lower productivity and greater survival rates than more northern and inland populations (Lennartz and Heckel 1987; DeLotelle and Epting 1992). These differences may be due to lower winter temperatures and survival with greater reproductive effort in northern populations, and life history evolution in more favorable southern climates where greater survival and lower annual reproduction are responses to increased competition (Conner et al. 2001).

Subadult/juvenile females from the current year breeding season normally disperse before the next breeding season, or are driven from the group's territory by the group (see Walters et al. 1988, for additional sociobiological/cooperative breeding information). Juvenile females remain at their natal territory to assume the breeding vacancy of the female only when the breeding male dies and the breeding female disperses or dies. A breeding female will disperse, creating a breeding vacancy, when her male offspring inherit the male breeding position (incest avoidance). Dispersing juvenile females move to nearby RCW territories in search of a breeding vacancy. These females either become breeders in a territory, or floaters among more than one territory where they are not associated with a particular group.

Juvenile males remain in their natal territory or disperse. Those that remain become helpers or, if the breeding male dies before the next breeding season, breeders. Dispersing juvenile males search for positions as breeders in nearby territories where they either become breeders, helpers, or floaters. Most adult male helpers remain on their natal territory as helpers; about 15% will inherit the territory as a breeding male in any given year. Some adult helpers disperse to other territories becoming breeders, solitary males, helpers, or floaters. However, breeding males are highly territorial and most will remain even without a breeding female. In contrast, about 10% of breeding females will break the pair-bond between breeding seasons and disperse to another territory as a breeder with a different male (Walters et al. 1988; Daniels and Walters 2000b).

Habitat Quality

High quality RCW foraging habitat consists of an open fire-maintained pine forest, with no or a sparse midstory of hardwood or pine, low densities of small pine (less than 10 inches DBH), moderate densities of medium-sized (10 – 14 inches diameter at breast height [DBH]) and large

(greater than14 inches DBH) pine, at least low densities of old growth pine, and a well-developed herbaceous plant ground cover (James et al. 2001; Walters et al. 2002b). RCWs selectively forage on larger and older pines more frequently than their availability relative to younger and smaller trees (Zwicker and Walters 1999; Walters et al. 2002b). Overall, RCWs preferentially use pine 12-20 inches DBH, prefer trees greater than 20 inches DBH, use trees less than 20 inches DBH depending on the availability of larger trees, and avoid trees less than 12 inches DBH when larger trees are available (Walters et al. 2000). RCW group size, productivity (fledglings produced), or both are negatively related to an increasing density of small and intermediate-size pine, as well as the density and height of the hardwood midstory (Conner and Rudolph 1991; Rudolph and Conner 1994; Hardesty et al. 1997a; Engstrom and Sanders 1997; James et al. 1997, 2001; Walters et al. 2002b).

Reasons for Listing

The precipitous decline of RCWs was caused by an almost complete loss of habitat. Before European settlement, the number of RCW groups inhabiting longleaf pine forests and all southern pine forests has been estimated at 920,000 (Costa 2001) and 1.5 million (Conner et al., 2001), respectively. Fire-maintained old growth pine savannahs and woodlands that once dominated the Southeast (92 million acres pre-European settlement; Frost 1993) no longer exist except in a few small patches (less than 3.0 million acres today; Frost 1993). Longleaf pine ecosystems are now among the most endangered systems on earth (Simberloff 1993; Ware et al. 1993).

Loss of the original pine ecosystems was primarily due to intense logging for lumber and agriculture. Logging was especially intense at the turn of the century (Frost 1993).
Two additional factors in loss of pine systems in the 1800's and earlier were exploitation for pine resins and grazing of free-ranging hogs (Wahlenburg 1946, Frost 1993). Later in the 1900's, fire suppression and detrimental silvicultural practices had major impacts on the status of RCWs (Frost 1993, Ware et al. 1993, Ligon et al. 1986, 1991, Landers et al. 1995). Additionally, longleaf pine suffered a widespread failure to reproduce following initial cutting, at first because of hogs and later because of fire suppression (Wahlenburg 1946, Ware et al. 1993).

Current Threats and Population Trends

Most RCW populations on public lands, as well as those private land populations in partnerships with the Service, have been stabilized, and many are now increasing. This steady increase can be attributed to various factors, including aggressive prescribed burning programs, artificial cavity (Copeyon 1990; Allen 1991) and translocation (Costa and DeLotelle 2006). In 1993/1994, the range-wide population was estimated at 4,694 active clusters (Costa and Walker 1995). In 2001and 2003, the range-wide population estimates were 5,627 (U.S. Fish and Wildlife Service 2003; Costa 2004) and 5,800 active clusters, respectively (Costa and Jordan 2003); and in 2006 it was 6,105 active clusters (U.S. Fish and Wildlife Service unpublished data).

In 2013, there were an estimated 7,200 active clusters range-wide (U.S. Fish and Wildlife Service unpublished data). Of the 39 designated recovery populations in the 2003 Recovery Plan, a total of 6120 active clusters were present in 2013, the last available population census year. Overall, the 5-year trend for all combined designated recovery populations increased from 5012 active clusters in 2008 with an overall average annual geometric rate (r) of 0.041 (4.1%).

The median population growth rate (n = 39) was 0.048, with a range of -0.002 to 0.187. Thirty eight of the 39 recovery populations (97%) were either stable or increasing, based on number of active clusters, during the most recent 5-year growth period (2008 - 2013) for which data is available. Only one population had a declining trend during this period, the Vernon-Fort Polk Primary Core (-0.002). The Vernon-Fort Polk decline during this period was less than the Service's critical threshold for decline as a decrease of 10% or more in any one year or 5% during a 5-year period.

Most of the 39 recovery populations are composed of one of more adjacent properties. The current recovery plan identifies 63 properties involved in recovery, of which at least 3 have very minor roles due to their small potential population size and management in their designated recovery population. Of the 60 properties with more significant roles in recovery, 3 (5%) had a net 5-year declining trend, although with a total net loss of only 7 active clusters. Large recovery populations remain rare. Of the 26 designated recovery populations with a population size objective of 250 or more potential breeding groups, 6 (23%) populations consist of more than 250 potential breeding groups.

Primary threats to species viability all are related to 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 1987).
The natural growing season fire regime that maintained quality foraging habitat 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. RCWs, 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).

Genetics

Genetically, most variation is partitioned (greater than 86%) among individuals within populations, rather than among populations (14%), according to allozyme (Stangel et al. 1992; Stangel and Dixon 1995) and random amplified polymorphic data (Haig and Rhymer 1994, Haig et al. 1996). The genetic structure of populations is significantly, although weakly, spatially heterogeneous (Stangel et al. 1992; Haig and Rhymer 1994), but somewhat more structured than in most non-endangered birds (Haig and Rhymer 1994). Genetic distance (dissimilarity) tends to increase as the geographic distance between populations increases (Stangel et al. 1992; Haig et al. 1996). Mean heterozygosity among populations is relatively high and comparable to other species, although allelic diversity in some small populations is reduced (Stangel et al. 1992). Unique alleles are not known to distinguish populations. These genetic characteristics are generally expected in a historically widely-distributed species that only relatively recently has

become reduced in fragmented populations (U.S. Fish and Wildlife Service 2003). However, inbreeding depression has been detected within a relatively large population, adversely reducing rates of hatching and fledgling survival (Daniels and Walters 2000a).

Population Dynamics

Like other species, RCW population size during a given year is affected by birth, death, immigration, and emigration rates. However, RCW population dynamics also are significantly affected by the species' cooperative breeding system and behavior of territorial RCW groups with helpers. The spatial distribution and aggregation of groups affects the likelihood that breeders in a group will be replaced upon their death or dispersal by other RCWs. All of these factors regulate population size, stability, and viability as mediated by the effects of habitat, genetics, demographic and environmental stochasticity, and environmental catastrophes. RCW population size is commonly measured as the number of potential breeding groups (PBG), which is defined as an adult male and female, with or without helpers, occupying the same cluster. A total count of individuals, including non-breeding helper, single male groups, and floater adults, would not account for group and territory dynamics or the buffering effect of helpers as a replacement pool for breeders. In the absence of data for the number of PBGs, the number of active clusters is an index estimate of population size (number of groups). An active cluster is one where fresh resin from RCW activity at a cavity occurs on one or more trees. An active cluster may be occupied by a PBG or a single-male group. The number of single-male groups is also important because a large proportion of single-bird groups indicate a declining population.

Demographically, a RCW population is strongly affected by the dispersal distances of males and females from their natal group or birds that search for and compete for breeding vacancies at other groups. At North Carolina study sites (North Carolina Sandhills and Camp Lejeune), dispersing juvenile and helper males rarely assumed breeding vacancies at clusters located more than 2 miles from their natal or group site (Daniels 1997; Walters et al. 1988). Juvenile females from the same study areas were capable of longer forays, becoming breeders at clusters up to 3.7 miles away (Walters et al. 2008). In western Florida (Eglin Air Force Base), adults dispersed an average 1.1 miles, juvenile females 2.0 miles, and juvenile males 5.0 miles (Hardesty et al. 1997b).

The number of RCW group territories increases by two primary processes (1) pioneering, the colonization of a previously unoccupied territory, and budding, the creation of a new group by subdividing an existing group territory and its cavity trees, usually by a group helper or an immigrant male (Conner et al. 2001). . Pioneering and budding rarely occur under current conditions, with rates, respectively, of only 0.06-1.5% per year (U.S. Fish and Wildlife Service 2003) and 0.6-2.1%.

Population Stability

RCW population viability depends on a sufficient number of stable groups to avoid adverse effects of inbreeding, genetic drift, and impacts from stochastic genetic demographic, environmental, and catastrophic events. Small populations are particularly sensitive to exacerbating effects of stochastic factors (Soule 1987, Clark and Seebeck 1990), which can drive local extirpation or extinction (Gilpin and Soule 1986).

Spatially Explicit Population Models (SEPM) simulate the movement and fate of each individual in a population depending on its status and currently are the most accurate models simulating RCW population dynamics and viability (e.g., Letcher et al. 1998; Daniels et al. 2000; Walters et al. 2002a). RCW SEPMs have revealed significant effects of spatial structure and distribution of groups on viability, based on the relatively short dispersal distances of male juveniles and helpers (2 miles) and females (3.7 miles) to inherit breeding vacancies in nearby territories (Walters et al. 1988, Daniels 1997, Walters et al. 2008) -- groups located at greater distances and at lower densities are much less likely to sustain breeding pairs, becoming demographically isolated and more vulnerable to local extirpation.

Letcher et al. (1998) determined, using SEPM analysis with the added effects of demographic stochasticity, that small populations with 49 highly aggregated groups are stable over 100 years, and smaller populations of 25 highly aggregated groups are highly persistent for about 60 years. Highly aggregated groups share common territorial boundaries. Even smaller, highly aggregated populations of 20 and 10 groups have good persistence for 20 years, although population growth rates are less than 1.0 and slowly declining (Crowder et al. 1998). Highly aggregated populations of 49 groups are more stable than minimally aggregated populations of 169 or 250 groups, and non-highly aggregated populations with less than 100 groups decline and are not viable. The strong persistence of highly aggregated RCW populations reflects the demographic effect of the helper birds. Variation in breeder mortality is dampened by helpers that replace breeders. Fluctuating periods of greater breeder mortality tends to reduce the size of the helper class instead of reducing the number of breeding groups (Walters et al. 2002a). Regardless of the aggregation or clumping of the modeled populations in their study (Letcher et al. 1998), populations of 500 groups were viable, as were moderately aggregated groups of 250.

Walters et al. (2002a) concluded that RCW population persistence and viability in response to demographic and environmental stochasticity was similar to that of comparable populations affected only by demographic stochasticity. The added effects of environmental stochasticity were relatively small compared to viability analysis of other species. Once again, the non-breeding class of helpers in the RCW cooperative breeding system had a buffering effect on breeder mortality and loss of breeding groups.

Inbreeding

Daniels et al. (2000) used a RCW SEPM to assess potential inbreeding effects with demographic and environmental stochasticity to viability in small populations of 25, 49 and 100 groups with a moderate level of group aggregation. In earlier studies, Daniels and Walters (2000a) documented actual effects of inbreeding depression in RCWs, including reduced hatching success and fledgling survival. Daniels et al. (2000) found that inbreeding depression is a serious viability threat to small, isolated, and declining RCW populations. RCW populations of 25 and 49 groups declined, as in other RCW SEPMs. The stable population of 100 groups was only marginally persistent over their 50-year simulation period, and may not have been stable if simulated for a 100-year period. The mean percentage of closely related breeding pair increased for all populations. Closely related breeding pairs were most prevalent in populations of 25 and 49 groups, which were at risk of extremely high inbreeding. However, two or more immigrants to these populations per year could stabilize a declining trend and reduce significantly the number of closely related breeding pairs.

Catastrophes

Hurricanes, tornadoes, and southern pine beetles are the primary catastrophic events affecting RCW population stability. These events damage or destroy habitat, reducing the number of breeding groups by the loss of cavity trees and foraging habitat. Hurricanes are the greatest catastrophic threat, as indicated by their frequency, widespread distribution, intensity, and effects (Hooper and McAdie 1995). Hurricane Hugo, a category IV storm, destroyed about 87% of RCW cavity trees in the Francis Marion National Forest, reducing the estimated pre-storm population of 477 active clusters to 277 clusters that retained at least one remaining cavity tree (Hooper et al. 1990; Watson et al. 1995). Coastal populations, particularly small populations, are highly vulnerable while the most inland populations are at least risk. RCW populations in the Croatan National Forest (SC), Francis Marion National Forest (SC), Apalachicola National Forest (FL), DeSoto National Forest (MS), Eglin Air Force Base (FL), and Conecuh National Forest (AL) and nearby regions are the most vulnerable based on hurricane return periods and intensity (Hooper and McAdie 1995).

Southern pine beetle epidemics adversely affect loblolly pine much more than longleaf, which have greater resin production and resistance to attack. The loss of planted loblolly pine, which was planted in much of the historic longleaf pine range, as well as loblolly in its natural habitat, can be locally significant. More than 50 RCW groups lost all loblolly cavity trees in the Sam Houston National Forest in the 1980s, where more than 300 cavity trees were killed by beetles between 1982 and 1984 (Conner et al. 2001). Loss of cavity trees and foraging habitat in small populations can be locally severe, leading to a reduction in breeding groups and potentially threatening local extirpation in small populations (Mills et al. 2004).

Recovery Criteria

Recovery criteria in the Recovery Plan were formulated on the basis of 11 recovery units delineated according to ecoregions. Populations required for recovery are distributed among recovery units to ensure representation of broad geographic, ecologic, and genetic variation in the species. The wide geographic distribution reduces the threat of catastrophic habitat destruction and population loss by hurricanes. The distribution of populations and recovery units also will facilitate periodic RCW immigration and emigration among populations, which will be required to offset or reduce the loss of potential adaptive genetic variation within populations by genetic drift.

Downlisting to threatened status will be considered when each of the following criteria is met:

Criterion 1. There is one stable or increasing population of 350 PBGs (400 to 500 active clusters) in the Central Florida Panhandle (i.e., “The Central Florida Panhandle primary core population”). This criterion has been met. The Central Florida Panhandle Primary Core population consists of 800 active clusters.

Criterion 2. There is at least one stable or increasing population containing at least 250 PBGs (275 to 350 active clusters) in each of the following recovery units Sandhills, Mid-Atlantic Coastal Plain, South Atlantic Coastal Plain, East-Gulf Coastal Plain, West Gulf Coastal Plain, Upper West Gulf Coastal Plain, and Upper East Gulf Coastal Plain. The criterion has been

achieved in three recovery units: Sandhills (North Carolina Sandhills East Primary Core), Mid-Atlantic (Francis Marion Primary Core), and South Atlantic Coastal Plain (Fort Stewart Primary Core).

Criterion 3. Excluding the populations that meet previous criteria, there is at least one stable or increasing population containing at least 100 PBGs (110 to 140 active clusters) in each of the following recovery units Mid-Atlantic Coastal Plain, Sandhills, South Atlantic Coastal Plain, and East Gulf Coastal Plain. This criterion has been met. Each of the listed recovery units contains at least one population (different from the populations listed under Criterion 2 above) that harbors at least 100 PBGs.

Criterion 4. There is at least one stable or increasing population containing at least 70 PBGs (75 to 100 active clusters) in each of four recovery units: Cumberlands/Ridge and Valley, Ouachita Mountains, Piedmont, and Sandhills. In addition, the Northeast North Carolina/Southeast Virginia Essential Support Population is stable or increasing and contains at least 70 PBGs (75 to 100 active clusters). Only the Sandhills recovery unit contains a population harboring at least 70 PBGs (that would not be needed to satisfy either Criterion 2 or 3, which also require Sandhills populations of certain sizes).

Criterion 5. There are at least four populations each containing at least 40 PBGs (45 to 60 active clusters) on state and/or federal lands in the South/Central Florida Recovery Unit. This criteria has been met. Five populations exceed 45 active clusters: Big Cypress, Goethe, Ocala, Three Lakes and Withlacoochee Citrus Tract.

Criterion 6. There are habitat management plans in place for each of the above populations that identify management actions to increase the populations to recovery levels, with special emphasis on frequent prescribed burning during the growing season. Although Criterion 6 is referring to the need for populations to have such plans when they achieve their size goals, the majority of the populations required for delisting already have management plans that address habitat management (e.g., prescribed burning) and population monitoring. These plans are generally updated at 5-year intervals. The plans take the form of Integrated Natural Resource Management Plans (military installations), Land and Resource Management Plans (national forests), Comprehensive Conservation Plans (national wildlife refuges), and property-specific state wildlife management area and state forest plans.

Delisting will be considered when each of the following criteria is met. Criteria 1 – 4 also require that all potential breeding groups in each population are not dependent on artificial cavities.

Criterion 1. There are 10 populations of RCWs that each contain at least 350 PBGs (400 to 500 active clusters), and 1 population that contains at least 1000 PBGs (1100 to 1400 active clusters), from among 13 designated primary core populations, and each of these 11 populations is not dependent on continuing installation of artificial cavities to remain at or above this population size. Four populations have surpassed the population size objective of 350 PBGs: North Carolina Sandhills East Primary Core, Eglin Primary Core, Francis Marion Primary Core, and Fort Stewart Primary Core.

Criterion 2. There are nine populations of red-cockaded woodpeckers that each contain at least 250 PBGs (275 to 350 active clusters), from among 10 designated secondary core populations and each of these nine populations is not dependent on continuing installation of artificial cavities to remain at or above this population size. None of the 10 secondary core populations harbors 250 PBGs.

Criterion 3. There are at least 250 PBGs (275 to 350 active clusters) distributed among designated essential support populations in the South/Central Florida Recovery Unit, and six of these populations (including at least two of the following: Avon Park, Big Cypress, and Ocala) exhibit a minimum population size of 40 PBGs that is independent of continuing artificial cavity installation (i.e., "population trends"). This criterion has not been fully achieved. Of six required populations each with at least 40 PBGs, five populations (Big Cypress, Goethe, Ocala, Three Lakes, and Withlacoochee State Forest-Citrus) currently satisfy this element and with a combined total of 380 active clusters and about 340 potential breeding groups.

Criterion 4. There is one stable or increasing population containing at least 100 PBGs (110 to 140 active clusters) in northeastern North Carolina and southeastern Virginia, the Cumberlands/Ridge and Valley recovery unit (Talladega/Shoal Creek), and the Sandhills recovery unit (North Carolina Sandhills West), and these populations are not dependent on continuing artificial cavity installation to remain at or above this population size. One (North Carolina Sandhills West Essential Support) of the three populations required to exceed 100 PBGs is present.

Criterion 5. For each of the populations meeting the above size criteria, responsible management agencies shall provide (1) a habitat management plan that is adequate to sustain the population and emphasizes frequent prescribed burning and (2) a plan for continued population monitoring. Although criterion 5 is referring to the need for populations to have such plans when they achieve their size goals, the majority of the populations required for delisting already have management plans that address habitat management (e.g., prescribed burning) and population monitoring. These plans are generally updated at 5-year intervals. The plans take the form of Integrated Natural Resource Management Plans (military installations), Land and Resource Management Plans (national forests), Comprehensive Conservation Plans (national wildlife refuges), and property-specific state wildlife management area and state forest plans.

ENVIRONMENTAL BASELINE

The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process (50 CFR § 402.02).

In September 1994, the Service issued a BO to Ft. Benning (USFWS 1994). The BO concluded that ongoing military training and related activities at Ft. Benning jeopardized the continued existence of the Installation's RCW population. The reasonable and prudent alternative included increasing the number of RCW personnel, now 13, and improving management activities.

In September 2002, the Service issued a BO based on the review of the Installation's RCW Endangered Species Management Plan (ESMP) (Ft. Benning 2002, USFWS 2002). The 2002 BO required ongoing management activities that were non-discretionary, including burning 90,000 acres of current and potential RCW habitat on a return interval of three years; repairing and preventing soil erosion in clusters; coordinating a training area inspection process incorporating natural resources personnel; and reducing fuel around cavity trees. Additionally, the 2002 BO on the ESMP considered training activities and its approval as the catalyst that allowed the Installation to adopt the Army's 1996 Management Guidelines for the RCW (USDOA 1996) and gave the Installation incidental take coverage for 41 known clusters in the A20 Impact Area.

In July 2004, the Service issued a BO to the Installation for the construction, operation and maintenance of a Digital Multi-Purpose Range Complex (USFWS 2004). The project removed approximately 1,500 acres of upland pine habitat and wetlands. The BO concluded that jeopardy was not likely and seven PBGs were included in the incidental take statement (ITS). The ITS required activities to manage and monitor the seven PBGs that would be impacted as a result of the action, monitor RCW habitat that may degrade as training activities are implemented, and continue to protect cavity trees in all seven clusters during all stages of the project. Shortly after completion of the consultation, an inactive cluster became active and was included in the ITS so that a total of eight PBGs were expected to be incidentally taken by the action (USFWS 2006b).

In August 2007, the Service issued a BO for the construction, operation and maintenance of Transformation actions, to include Base Realignment and Closure, Global Defense Posturing and Realignment, Army Modular Force and other stationing actions. Pre-project, the Installation managed roughly 86,000 acres of pine habitat for RCWs. Post-project, the remaining pine habitat roughly totaled 74,700 acres, of which 21,400 acres were in loblolly or shortleaf pine stands that were determined to be in high risk for pine decline syndrome. The BO concluded 32 PBGs would be included in the ITS, and that the project would not jeopardize continued existence of the species. Within weeks of completion of the consultation, the Army notified the Service that the BRAC project was being modified and would be mostly realigned into the MCoE. All the components and the expected incidental take were reassessed. Once the original BRAC project was re-configured, only eight active clusters (i.e., 8 PBGs) were included in the original Transformation ITS that were not carried forward into the MCoE ITS.

In May 2009, the Service issued a BO to Ft. Benning (USFWS 2009). The BO concluded that Transformation actions and related activities jeopardized the continued existence of the Installation's RCW population. The reasonable and prudent alternative included removing a proposed machine gun range in the A20 training compartments, managing 36 additional active clusters in the A20 impact area which were not counted toward recovery, migrating heavy maneuver training aspects of the Scout Leaders Course (now called the Army Reconnaissance Course (ARC)) from the Southern Maneuver Training Area to training areas located off the FY09 Fort Benning installation boundary within five years from the training start date of the Scout Leaders Course, and re-scoping MCoE projects to avoid loss of 12 clusters and 1,406 acres of potential habitat.

In 2011, the Service issued a BO to Fort Benning (USFWS 2011). The BO concluded that part of an MCoE road construction project was anticipated to adversely affect two newly discovered clusters. The Service authorized incidental take for the two clusters (group level take) and determined that the level of anticipated take was not likely to result in jeopardy to the species.

In 2013, the Service prepared a BO that authorized the incidental take of one active RCW cluster in the form of direct loss of an active cavity tree and/or harassment of RCWs in the cluster. The estimated level of take authorized in the BO concluded it was not likely to jeopardize the continued existence of the RCW.

Status of the Species Within the Action Area

The Installation RCW management goal is to recover the population and remove any potential conflicts with the training mission (U. S. Army 2001). Currently, there are 374 manageable RCW clusters at Fort Benning, 363 active and 11 inactive. Only one active RCW cluster is known to exist adjacent to Fort Benning. This cluster is on land owned by the City of Columbus that was part of a land exchange with the Installation. The nearest RCW population is the Hitchiti Experimental Forest/Piedmont National Wildlife Refuge/Oconee National Forest population approximately 90 miles northeast of Fort Benning. Intensive management of the RCW has increased the population. During the period 1996 to 2014, the number of nests increased from 126 to 323 and the number of active clusters increased from 151 to 363.

Alpha-20 and Kilo-15 Impact Areas

In 2002, with Service approval of the 2002 RCW Endangered Species Management Plan (ESMP now ESMC) the Service authorized 41 incidental takes (USFWS 2002); to date, no adverse effects (take(s)) have occurred. This total included 29 clusters that were known to exist at the time and an additional 12 unknown groups that were estimated to exist in both A20 and K15 Impact Areas. Incidental take was issued for anticipated effects from explosive munitions fired into these areas and/or from wildfires caused by munitions. The Service rescinded incidental take for all clusters in the A20 impact area that would be counted towards the Installation's recovery goal in the Jeopardy Biological Opinion for MCoE actions (USFWS 2009).

Supplemental Recruitment Clusters

Fifteen incidental takes were authorized in the same 2002 ESMP; and similarly no (0) takes have occurred. Authorizations were issued for establishment of 15 SRCs that the Service assessed as clusters that could be incidentally taken as a result of military training. All 15 SRCs are currently active; 14 are PBGs and 1 is a single bird group.

Cavity Trees

Five active cavity trees per year were authorized for incidental take; as such, takes could be trees destroyed or injured as a result of military training and training related wildfires. Over the past 5 years, 18 active trees have died due to wildfires – all trees survived the actual wildfire event but later were found dead; at least 6 of these trees were also found to have an Ips beetle (*Ips sp.)* infestation so the wildfire may not have actually killed the tree but may have left it vulnerable to beetle attacks. The Service has since rescinded incidental take coverage for "random cavity trees" that were lost due to wildfire. However, in impact areas where PBGs are counted toward the Installation's population recovery goal, training related wildfires are considered to be

accidents and the Service addresses any impacts in the A20 Impact Area via emergency consultations (USFWS 2009).

Capture and Banding RCWs
One incidental take of an RCW per year is authorized as per the Federal banding permit. During the last 5 years, 2 incidental takes occurred from monitoring activities under the Federal banding permit; 1 nestling in 2009 and 1 nestling 2012.

DMPRC
Eight anticipated incidental takes authorized (7 authorized in the original document and 1 added that was inactive at the time of writing the BA but subsequently became active); 1 take has occurred. Habitat was removed from cluster D14-04 during the DMPRC construction phase. Cluster D14-04 went inactive and was subsequently removed from management due to being inactive for 5 consecutive years.

BRAC/Transformation
Eight anticipated incidental takes authorized; 2 takes have occurred. The cavity trees for clusters O09-04 and O09-05 were located within the footprint of 2 proposed ranges and were physically removed once the ranges were constructed. The resident RCWs were translocated prior to range construction as a nondiscretionary minimization measure in the BO (USFWS 2007).

MCoE
Eighty-one anticipated incidental takes authorized; 1 take has occurred (Note - one cluster that received an incidental take was subsequently determined to be a captured cluster and was never documented as having 2 nests so clusters were combined [J01-01 and J01-03 now called J02-A]). Two (2) other incidental takes that may potentially occur are SHC-02 (now called SHC-A) which has been inactive for 3 years (incidental take authorized due to neighborhood analysis) and U04-01 (now SHC-B) which has also been inactive for 3 years (incidental take authorized due to habitat loss). Although it is possible that these 2 clusters could be reactivated before the 5 year life span of the BO, they are currently considered inactive and may be deleted if they remain inactive for 5 consecutive years.

Supplemental MCoE
Two anticipated incidental takes authorized; 0 takes have occurred.

Malone Range Complex
One anticipated incidental take authorized; 0 takes have occurred.

Future Biological Assessments (BA)

Proposed Biological Assessment for Potential Red-cockaded Woodpecker Impacts from the Oscar Range Complex at Fort Benning, Georgia

Fort Benning is currently monitoring and analyzing the potential effects of bullet impacts to downrange RCW foraging habitat within the Oscar Range Complex as part of the non-discretionary Habitat Impact Assessment Monitoring Plan, Bermed vs. non-Bermed (USFWS

2007). As a result of that intensive monitoring, the Installation is preparing to conduct a BA that addresses bullet strikes detected outside the beaten areas of ranges in the Oscar Range complex. Five RCW clusters are associated with the Oscar Range Complex, and four of those are already covered by incidental take authorizations. Fort Benning anticipates completion of a BA and initiation of formal consultation with the Service in the first half of 2015.

Current Biological Evaluations (BE)

Biological Evaluations (BE) are prepared to analyze proposals for informal consultation with the Service in instances where more information is needed than can be contained in a letter but does not rise to the level of requiring a BA.

Biological Evaluation of Potential Impacts from the Proposed Multi-Purpose Training Range (MPTR) at Hastings Range (FB 2010)

Fort Benning evaluated the potential impacts on the RCW by upgrading Hastings Range to a Multi-Purpose Training Range (MPTR). The Installation's analysis concluded that the proposed minor design changes to the existing Hastings Range targetry and firing positions to meet gunnery standards for an MPTR, (in conjunction with the implementation of minimization measures), may affect but are not likely to adversely affect the 19 RCW clusters (now 20 RCW clusters as a result of natural budding) and associated habitat situated downrange. Through informal consultation, the USFWS concurred with this BE.

Key minimization measures implemented by the Installation include:

a. Eliminating live fire shot alignments likely to directly impact RCW clusters or habitat.
b. Ensuring that sufficient earthen backstops are aligned behind targets approved for engagement with large caliber munitions.
c. Protecting RCW nesting and foraging habitat by requiring new training events or new shot alignments occurring on the MPTR to be granted approval only after the NEPA process has been completed using the 144R Record of Environmental Consideration form.
d. Improvement of all potentially suitable forest stands within the 20 RCW cluster partitions using the Fort Benning modified Standard for Manage Stability (MSS).
e. Providing data of all forest stands considered to be future potential habitat to the USFWS prior to the range becoming operational.
f. Developing and implementing an MPTR RCW monitoring plan in coordination with the USFWS and ensuring negative effects are minimized.

As of the 2013 breeding season, all clusters monitored for this action were active. There has been some evidence of munitions intrusions and modifications have been made to delete some firing patterns. This has been reported to the Service and the Installation continues to monitor the situation. Monitoring is ongoing in accordance with the BE.

2. Biological Evaluation of Potential Effects from the proposed Changes to the Program of Instruction (POI) for the Army Reconnaissance Course (ARC) Training (FB 2011)

The Installation evaluated the potential impacts of a proposed change in the Army Reconnaissance Course (ARC) on the RCWs, specifically increase the training area for field operations in the "Blackjack" portion of the course, but not to eliminate use of tracked vehicles. The BE concluded that no new incidental takes were warranted as a result of the proposed changes to the ARC training. The Installation concluded that the impacts analyzed in this BE may affect but are not likely to adversely affect 43 RCW clusters located within the expanded area of operations by increasing the training area, nor will it impede their ability to reach the recovery goal of 421 total managed clusters. Through informal consultation, the Service concurred with this BE.

Key minimization measures taken included:

a. Eliminated the use of tracked vehicles from the POI implementation on Fort Benning.
b. RCW demographic monitoring is conducted in clusters identified in action area.
c. Deployed GPS tracking devices on all or most tactical vehicles during ARC training exercises to concentrate demographic and habitat monitoring efforts.
d. Incorporated additional training areas available to conduct ARC training into the MCoE Heavy Maneuver Effects Study on the RCW (USFWS 2009).
e. Conducted a preliminary analysis of the effects of vehicular disturbance on RCW flush response prior to the breeding season.

Note: All RCW clusters covered by this action were active as of the 2013 breeding season. Monitoring is ongoing as per the BE.

EFFECTS OF THE ACTION

Are the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. These effects are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species for purposes of preparing a biological opinion on the proposed action. [50 CFR §402.02] The environmental baseline covers past and present impacts of all Federal actions within the action area. This includes the effects of existing Federal projects that have not yet come in for their section 7 consultation.

Factors to be Considered

Training Impacts

A20 and K15 Impact Area Impacts - There are 2 main dudded impact or dudded areas on the Installation, A20 and K15. Historically, access into these areas has been extremely limited however, recent ground and aerial surveys have been conducted. A total of 69 RCW clusters have been documented in the A20 impact area, of which 61 are currently managed. The previous ESMP BO (USFWS 2002), required 3 A20 clusters to be managed. The DMPRC BO (USFWS 2004), required 11 A20 clusters to be managed for minimization of that project. The MCoE BO (USFWS 2009), required 36 additional clusters to be managed (these clusters vary from year to year depending on annual breeding season surveys and access). The additional 11 clusters in the

A20 dudded Impact Area are inspected yearly. One other cluster, A20-47, is known to exist in the A20 Impact Area that was documented during aerial surveys, but it is in a location that is too dangerous for ground access and cannot be managed. There are also 7 clusters in A20 that are currently inaccessible due to a safety hazard (i.e., UXO). Efforts are ongoing to re-gain access to these areas and therefore may be able to manage these clusters in the future.

At least 4 RCW clusters were identified in the K15 Impact Area via aerial surveys. Since access to this training compartment is not allowed, none of these clusters will be monitored or counted towards recovery goals. The K15 Impact Area will still serve as a dispersal corridor between the northeast corner and the rest of the RCW population.

Fire Impacts – Prior to the MCoE consultation, 5 incidental takes were authorized for active cavity trees per year; takes could be trees destroyed or injured as a result of military training and training related wildfires. Over the past 5 years, 18 active trees have died due to wildfires – all trees survived the actual wildfire event but later were found dead; at least 6 of these trees were also found to have an Ips beetle infestation so the wildfire may not have actually killed the tree but left it vulnerable to beetle attacks. The Service has since rescinded incidental take coverage for cavity trees that are not specifically identified in advance (USFWS 2009).

HMU-1 / Down Range Impacts - In total, the Installation currently has 5 monitoring plans designed to assess varying types and degrees of potential down range impacts to RCWs. All of the monitoring designs were implemented as a result of various consultations. The efforts include 1) monitoring potential impacts from the Digital Multi-Purpose Range Complex, 2) monitoring impacts down range of the Oscar Range Complex, 3) monitoring the effects on RCWs from heavy maneuver training, 4) impacts monitoring resulting from the Multi-Purpose Training Range, and 5) monitoring impacts to clusters in the A20 Impact Area.

In recent years, Fort Benning biologists have documented increases in the numbers of new clusters being formed through natural budding and pioneering as RCWs take advantage of remaining suitable habitat. When RCWs form new clusters into habitat that does not meet Recovery Plan foraging habitat guidelines (recovery or managed stability standards), a domino effect can be created to some or all existing adjacent groups. These conditions can delay or even stop actions that include military training and/or forest restoration activities. The problem generally occurs when new clusters are established downrange of live-fire ranges through natural budding and pioneering.

The most serious impacts have been associated with groups that either budded or pioneered within the range fans of live-fire ranges. By virtue of their location in or near extremely hazardous areas, they are always at some level of risk associated with varying degrees of munitions impacts, either directly or indirectly from training. The extreme outer limit of this low risk area is defined as the safety buffer of the SDZ and also represents the boundary to which all access to the training compartment(s) is restricted. The SDZs usually have a ricochet zone inside the safety zone, and then the beaten area lies in the interior of the SDZ. The Installation conducts modeling or analysis to indicate the zone that is typically devoid of trees situated immediately downrange of the range targets that receive direct, repeated and sustained impacts from live-fired munitions. This area is referred to as the beaten area. Between the edge of the beaten area and the

boundary of the SDZ is the area where the risk of effects to RCWs typically occurs (USFWS 2013). This zone receives impacts from munitions that are not direct, repeated, or sustained and are more likely attributable to ricochets or human error. Although detectable upon close inspection of individual trees, the level of impact from munitions within a given stand generally do not show signs of excessive tree mortality that would suggest a problem at this time. Many of these ranges have been operational for decades and yet downrange RCW PBG density has continued to increase over that same time period in all of these areas; overall RCW reproductive success is comparable to those groups outside of HMU-1; and visual comparison of historical vs. current aerial photography suggests that the overall total amount of forested area within these limited access areas appears to actually have increased since it became a military live-fire range.

When RCWs establish territories downrange, their cavity trees and foraging habitat can be exposed to bullet strikes from any number of weapon systems and types of munitions, primarily 5.56 mm, 7.62 mm, 9 mm, .50 cal., 25 mm, 40 mm, and 120 mm. Impacts from munitions (or the components/shrapnel originating from the round) to downrange trees can occur by direct (human error shooting over a target or from ricochets) or indirect (trees damaged by munitions are thought to be more susceptible to wildfire or disease and insect attack). The probability of subsequent loss of nesting and foraging habitat depends on cluster location, munitions type, and amount of range use. Although the Service and Installation biologists have attempted to resolve these downrange impact area/RCW issues when they occur, resolution can be challenging. Ultimately, a long-term solution to these ongoing challenges is needed to better meet the needs of the resource and military training.

Transitioning to the 2007 Management Guidelines for the Red-cockaded Woodpecker on Army Installations - The 2007 RCW Army Guidelines allow for each Installation to systematically remove boundaries/training restrictions from protected clusters as certain PBG goals are met. Installations with less than or equal to 250 PGBs will maintain the current number of protected clusters for both active clusters and recruitment clusters. Installations with populations greater than 250 PBGs may remove training restrictions from clusters accordingly: Total PBGs: 251-275 training restrictions may be removed from clusters on a 1 to 1 ratio for every PBG above 250 (25 clusters), i.e. for every 1 PBG above 250, restrictions may be removed from 1 cluster, cumulative total 25; Total PBGs: 301-350 – training restrictions may be removed from clusters on a 3 to 1 ratio for every PBG above 300 (150 clusters), i.e. for every 1 PBG above 300, restrictions may be removed from 3 clusters, cumulative total 225; Total PBGs: 351 plus – training restrictions removed from all clusters.

The potential implementation of this process is complicated by the amount of incidental take that has been authorized through the DMPRC, BRAC and MCoE BOs. Even though there are currently 334 PBGs, when the taken clusters are subtracted from this total only 246 PBGs remain. Therefore, the Installation will not begin designating new UCs and removing restrictions until the 250 PBGs threshold is achieved. Once this goal is met and training restrictions begin to be lifted, no cluster currently covered under an incidental take statement will be considered for UC category until such time as the incidental take statement is removed, the exception being SRCs which will become UCs.

Forest Management Impacts

Installation Wide Application of the Fort Benning Managed Stability Standard - During consultation with Service for BRAC and MCoE actions, a revised MSS for Fort Benning was authorized. The revised MSS was based on 10 years of demographic data provided by the Installation. Now, the Installation proposes to establish this revised standard throughout the Installation for the term of this ESMC. The revised MSS proposes modification from 40ft^2 BA/acre to 30ft^2 BA/acre. Using this revised standard, all MSS criteria as listed in the Recovery Plan and above must be met, except that the acceptable BA range for pines ≥10 in. DBH is modified to include stands with an average BA of ≥ 30 ft^2/acre versus 40ft^2/acre. The minimum acreage required is directly correlated to the average BA of stands within the partition. Partitions containing stands with BA of 40 ft^2/ acre would still require a minimum of 75 acres, however, partitions with stands averaging 30 ft^2/ acre BA would require up to 100 acres to meet the minimum of 3,000 ft^2 total BA.

Modifying the Midstory Monitoring Requirement - Status of midstory on Fort Benning is captured via 10 year forest inventory and yearly cluster evaluations. Given this level of habitat evaluation and that the Installation is on a three year burn rotation, the Installation proposes that additional 5 year midstory surveys as stated in the Recovery Plan are not necessary.

Adjusting the Number of Groups Needed to Attain 351 Potential Breeding Groups - Based on the analysis of 5 years of cluster occupancy and group composition data, the Installation proposes to change the number of managed and active clusters required to achieve its population goal of 351 PBGs. Analysis of similar data for other large and recovered populations supports the Installation's proposed changes. Installation staff will manage 390 clusters and maintain at least 370 active clusters to assure that their population goal of 351 PBGs is achieved and maintained. This change accounts for the Installations current composition of single bird, captured and inactive clusters to account for the total number of clusters needed to meet their population recovery objective.

Effects Analysis

The Service considered the beneficial effects and the direct and indirect adverse effects of implementing the proposed ESMC on RCWs. Direct effects encompass the direct and immediate effects of the project [implementing the ESMC] on the species. Indirect effects are caused by or result from the proposed action's effects occurring later in time, and are reasonably certain to occur. The impacts discussed below are the result of direct and indirect effects of the proposed action.

Beneficial effects: Overall, the effects of the ESMC's implementation are anticipated to be beneficial for the RCW. The plan calls for continuation of management practices designed to conserve and promote the growth of the population toward the Installation's carrying capacity of 410 RCW clusters. Based on the current assessment of suitable and potentially suitable habitat, the Installation plans to manage 390 clusters and associated territories in order to attain 351 potential breeding groups.

Military Training

Analysis of the proposal for incidental take in the K15 Impact Area
The previous Endangered Species Management Plan authorized 4 incidental takes in the K15 dudded Impact Area. For this Endangered Species Management Component, the Installation requests incidental take coverage for 4 RCW groups that are known to exist within the area (based on 2009 aerial surveys). The Installation also requests incidental take for any future clusters that might form through natural expansion of RCWs into the K15 Impact Area. The Installation is requesting take for these groups in part because they are located within areas that personnel currently and historically have identified as having the potential to contain types and quantities of unexploded ordnance and are deemed too hazardous for personnel to access. No monitoring or management for RCWs is proposed to take place in this impact area as it is off limits to all personnel. If approved, no clusters within this compartment would be counted towards the Installation's recovery goals.

Projected Effects of the Action

- 4 groups lost at 2 birds/group totals 8 birds, and
- 4 groups lost at 150 acres/group totals 600 acres of suitable and/or potentially suitable habitat

Cluster Level Analysis
This request (i.e., area too hazardous) is consistent with conditions that have already been used to permit IT through previous consultations. It should be noted however, that in instances where specific groups, clusters, territories, PBGs, etc., are not explicitly identified, the Service uses worse-case-scenario to conduct these analyses. Furthermore, additional assessments may be needed if the removal of the group(s) leads to spatial and/or temporal concerns (i.e., indirect effects analysis).

Analysis of the proposal for incidental take in the A20 Impact Area
The previous ESMP authorized 41 incidental takes in the A20 dudded impact area. For this Plan, the Installation requests coverage for 8 RCW groups within the area (A20-02, A20-36, A20-47, A20-58, A20-59, A20-65, A20-67, and A20-68). These groups are located in areas that the Installation has identified as having the potential to contain a type of UXO that is deemed too hazardous for personnel to access from the ground. No monitoring or management of RCWs should take place in areas that have been designated as off limits to all personnel until the presence or absence of this UXO type can be confirmed. No clusters with cavity trees within these areas that are declared off limits will be counted towards fulfillment of the Installation's recovery goals. If any of these clusters are deemed safe for personnel to access from the ground in the future, the Installation should notify the Service and re-instate that group into the pool of monitored RCW clusters as described in the A20 RCW Monitoring Plan.

Projected Effects of the Action

- 8 groups at 2 birds/group totals 16 birds, and
- 8 groups at 150 acres/group totals 1200 acres of suitable and/or potentially suitable habitat

Cluster Level Analysis

As with the K15 Impact Area, the circumstances and reasoning used to formulate this request (i.e., area too hazardous) is merely an extension of the reasoning and circumstances that have been permitted by the Service in previous consultations. The Service takes into account that eight anticipated takes within an impact area should not inhibit the Installation from attaining their population recovery goal. The same conditions apply to K15 as stated in the A20 description above.

Analysis of the proposal for incidental take on the subject of fire

The Installation requests incidental take coverage for up to 5 active RCW cavity trees and three RCWs per year over the 5-year life of this Plan, resulting from prescribed fire, training related wildfires or wildfires that are allowed to burn (i.e., IT is requested for all ignition source). As proposed, the incidental take coverage would include both direct and indirect effects of fire, including the removal of habitat. The Service recognizes that individual RCWs, nests containing eggs and/or nestlings, cavity trees, and foraging habitat can be injured or destroyed as the result of prescribed burning. The Service is aware that the Installation's staff already takes measures to prevent damage or destruction to RCWs and/or cavity trees including raking or burning around cavity trees and the use of water and fire retardant materials. It is recognized that foraging habitat is protected during prescribed burns by preparing and implementing a burn plan. The 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 however, the Installation proposes that local weather changes, higher than estimated fuel loads, and other unforeseen factors may cause escaped prescribed burns or out of prescription burns.

Projected Effects of the Action

- 3 RCWs/year over 5-years totals 15 birds, and
- 5 active cavity trees (which could include the 3 birds/year requested).

Cluster Level Analysis

Since 2002, the Installation has been required to burn a total of 90,000 pine acres over a three year period (USFWS 2002). From 2002 through 2014, the amount of acres burned totals roughly 360,000, of which, there has only been one report of an adverse effect to RCWs. On May 27, 2011, two RCW nestlings were killed inside their cavity resulting from a military training related fire. This incident occurred on the first day of operations for the newly constructed Digital Multi Purpose Range. The result of that mishap triggered a formal investigation by Service and measures were taken by the Installation to resolve the Issue.

From 1985 through 2012, the number of wildfires has been reduced from 600 to 100 and acres burned, has gone up from roughly 7,000 acres per year to roughly 30,000 acres per year (e.g., 30,000/year as a means to achieve 90,000 acres in three years). These data, when coupled with the current burn policies, standard operation procedures, and more areas being burned on 1 to 2 year rotations (~ 64,000 acres), suggests that the likelihood of adverse impacts occurring to RCWs from fire are unlikely. The Service recognizes that in some situations where species or the effects on that species may be difficult to detect, authorization of incidental take is more broadly applied than traditionally authorized. However, in this case, when considering the data and

conditions listed above, the likelihood (probability) that an adverse effect from fire will occur appears remote. Based on the data and the current policies implemented by the Installation, the Service reasons that no more than two birds over the life of this Plan are reasonably likely to be adversely impacted from fire, regardless of the ignition source (i.e., wild, prescribed, or military training event).

Analysis of the proposal for incidental take on the subject of downrange cluster impacts
The Installation requests incidental take coverage for up to 3 RCW clusters through the 5-year life of this RCW ESMC that may bud or pioneer new territories into habitat situated downrange of live-fire areas within HMU-1. When a new cluster is discovered within the area, the Installation proposes to incorporate that cluster into its regular demographic monitoring schedule of its RCW population and then count this new cluster towards its population recovery goal. If it is discovered that a portion of its habitat is found to be receiving impacts from munitions, Installation biologists propose to evaluate the extent of the anticipated impact in coordination with the Service. Fort Benning would abide by the 2007 Army Guidelines and where there is significant risk of projectile damage to foraging or nesting habitat, measures to minimize the impacts to RCWs would be considered. These minimization measures are proposed to include range layout modification/shielding where practical and economically feasible to protect HMUs from projectile damage. The Installation proposes to consider other protective measure including reorienting the direction of weapons fire, shifting target arrays, establishing "no firing areas" around RCW clusters or HMUs, revising maneuver lanes, construction berms, etcetera. Monitoring of these minimization measures would be conducted over a reasonable period of time to evaluate their effectiveness. If the newly budded or pioneered cluster is deemed to be at risk of rising to the level of incidental take as a result of significant risk of projectile damage to foraging or nesting habitat as previously described above, the Installation proposes to informally consult with the Service. Upon completion of the consultation, the Installation would then request use of one of its authorized incidental takes and then subsequently no longer count that cluster towards its population recovery goal. The Installation suggests that any habitat that cannot be protected from significant damage from munitions would be removed from the total baseline habitat.

<u>Projected Effects of the Action</u>

- 3 future clusters over the term of the ESMC (5-years)

<u>Cluster Level Analysis</u>
Currently, there are 37 RCW clusters impacted (munitions impacts) at fixed ranges. Twelve are associated with the Hastings Multi Purpose Training Range, 4 are associated with the Oscar Range Complex, 8 are associated with the Dixie Road Ranges, 2 are associated with the Malone Range Complex, and 11 are associated with the Digital Multi Range Complex. Based on the historical information provided in the ESMC (italicized below), the Installation's request for incidental take regarding 3 future clusters that may occur downrange sometime in the future appears unsupported…

> *"…in the past 17 years 24 new RCW clusters have been established in HMU-1 [as newly proposed] via budding or pioneering. Additionally over that same time period, Fort Benning biologists have never documented or suspected an active, monitored cluster within HMU-1 as going inactive as a result of habitat loss or harassment attributed to munitions fire."*

Notwithstanding, of the 37 groups impacted the Service considers the territories most vulnerable are downrange of Hastings MPTR. Vulnerability in this case is linked to the severity of damage these munitions (large caliber, etc.) can cause. When broadly applied, severity considers the ability of a species to recover from the disturbance in question. That is, the longer it takes to recover from the disturbance, the more severe and subsequently, the more susceptible to the effects of multiple actions the species becomes. In this case, severity includes rounds with the ability to sever cavity trees, ignite wildfires and cause significant adverse impacts to habitat resulting from as little as just one training event.

When considering the extent to which an action impacts a species, Service guidance (USFWS and NMFS 1998) states "when determining an action area, it must include the project site and all the areas surrounding the activity up to where the effects will no longer be felt by the listed species." In the case of RCWs, the action area is determined by their neighborhood. The neighborhood delineation is a calculation based on the average dispersal distances birds take when either filling or creating territories. From the Installation's 11 year dataset, biologists have determined the average dispersal distance for the population is 2.57 miles. Applying this distance to the ranges in HMU-1 shows that the majority of impacted clusters are positioned within this distance. The Service has no opposition to the amount of take proposed, but would limit the extent to which these assessments are made to the average dispersal distance of 2.57 miles.

Forest Management

Analysis of modifying the Installations Managed Stability Standard
During consultation for BRAC and MCoE actions, the Service authorized a revised MSS. The revised MSS was based on the Installation's 10 year dataset of demographic information. Now, the Installation is proposing to establish the revised standard for the entire RCW population.

The revised MSS proposes modification from 40ft^2 BA/acre to 30ft^2 BA/acre. Using this revised standard, all MSS criteria as listed in the RCW Recovery Plan must be met, except that the acceptable BA range for pines ≥10 in. DBH is modified to include stands with an average BA of ≥ 30 ft^2/acre versus ones with 40ft^2/acre. The minimum acreage required is directly correlated to the average BA of stands within the partition. That is, partitions containing stands with suitable BA of 40 ft^2/ acre would still require a minimum of 75 acres, however, partitions with stands averaging 30 ft^2/ acre of suitable BA would require as much as 100 acres to meet the minimum of 3,000 ft^2 total BA. In total, the Installation would add 253 more clusters to those that were already approved (121) at 30 BA from the MCoE consultation.

Cluster Level Analysis

- N/A

Projected Effects of the Action

- N/A

Analysis of modifying the Installations midstory assessment protocol
For more than a decade, every cluster on the Installation has been inspected annually. Inspections are typically conducted between March and April. Data recorded has included, but is not limited to: hardwood midstory density, condition of cavity trees and cavities, activity status of each cavity, presence/absence of PBGs, description of any damage from training activity (tree damage, digging, CS or smoke canisters, etc.), fire, wind, erosion or kudzu problems, insect or disease problems, general stand management recommendations, and the location and status of any newly discovered cavity trees. Recommendations for remedial measures are typically included whenever necessary. Finally, all recruitment clusters are inspected in the fall (September - October). This level of observation coupled with the extensive commitment to habitat management the Installation has conducted throughout the years, renders the likelihood of midstory encroachment going unnoticed, or becoming problematic, remote.

Cluster Level Analysis

- N/A

Projected Effects of the Action

- N/A

Analysis of changing the Installation's population recovery goal
The current RCW population on Fort Benning must be increased to reach a population goal of 351 PBGs. In order to achieve 351 PBGs, biologists have calculated that a minimum of 382 manageable clusters are needed. The difference in the two numbers accounts for a portion of clusters will be activated by single birds attempting to attract a mate and some clusters will be captured and kept active by an adjacent RCW group.
For habitat considerations, any suitable foraging stand that is non-contiguous (separated by 200 feet from a suitable foraging stand or the cluster) with any other stand is deleted from the baseline; as well as any other stands that are determined to be unmanageable. The ARCGIS tool is further used to determine the locations of all current potentially manageable RCW clusters and their associated half-mile foraging partitions. Potential recruitment clusters are then added to the landscape such that each new cluster would have at least 150 acres of habitat while not reducing any existing clusters below the FTBMSS. Based on this analysis, the Installation should support at least 410 clusters, surpassing the needed 382 manageable clusters that were calculated as the required number to reach recovery. The 382 calculation is based on the last 5 years of breeding season data.

Cluster Level Analysis

- N/A

Projected Effects of the Action

- N/A

Analysis of the proposal for incidental take on the subject of unprotected cluster designations
The Installation requests continued incidental take coverage for the 15 RCW groups that are currently designated SRCs and which will be converted to UCs. The Installation also requests that these groups continue to count towards its population recovery goal as allowed by the 2007 Army Guidelines.

Projected Effects of the Action

- 15 groups at 2 birds/group totals 30 birds

Cluster Level Analysis
Army Guidelines allow all PBGs to count where training restrictions are and are not implemented. The Army's 1996 RCW Guidelines state that incidental take will be provided for supplemental clusters, which in this case are synonymous with those designated as unprotected in the 2007 Army Guidelines. The 2007 Guidelines allow installations to count these PBGs toward their population recovery goal even though this appears contrary to the Service SOP that states PBGs that are taken do not count toward population goals. The justification for such reasoning is accounted for in the Services provisions to assess RCW issues on a "case-by-case" basis. The Army has provided an extensive set of publications that infer military training (but for a select set of training operations) do not adversely impact RCWs which has lead to the reasoning for unprotected clusters counting toward their population objectives.

Analysis of RCW monitoring
The Installation will 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. This permit is renewed every 3 years or as necessary due to personnel changes.

Projected Effects of the Action

- N/A

Cluster Level Analysis

- N/A

Neighborhood Level Analysis
The Neighborhood Level Analysis evaluates indirect group density impacts to clusters not directly impacted by the proposed action but are within a 2.57 mile radius (Neighborhood). For this proposal however, all incidental take requests are for unknown groups. As such, the analysis for spatial configuration (indirect effects) will need to be reconciled (assessed) at the time of the consultation.

Population Level Analysis
Population level analysis will be subjected to the same limitations as those described above. When applied, this assessment examines 1. cluster impacts, 2. fragmentation, 3. spatial arrangement of remaining clusters, and 5. population status. Like the Neighborhood Analysis, this level of assessment cannot be accounted for at this time.

Recovery Unit Analysis
This process requires analyses at the cluster, group, neighborhood and population levels. In conjunction with the reasoning above, it is reasonable to infer that Fort Benning will retain the ability to support a primary core population, and thereby continuing to perform the role described for it in the species' recovery plan (USFWS 2003a). The proposed action is not likely to delay, and will not prevent, recovery of the Installation's RCW population.

Overall, the Service anticipates 3 adverse effects (e.g., take) to occur within HMU-1 resulting from birds pioneering or budding into the area. Therefore, the Installation-wide RCW projection is calculated as: 410 managed clusters, minus 3 groups lost from actions associated within HMU-1, yields 407 managed clusters. Using the Installation's current projections, 382 managed clusters are needed to attain 351 PBGs. Until the Installation reaches 407 managed groups on the landscape, the true proportion of non-breeding groups compared to the number of PBGs is unknown, however, as the Installation moves toward carrying capacity (i.e., 407), it is highly probable that 407 managed clusters will yield 351 PBGs.

CUMMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section as they require separate consultation pursuant to section 7 of the Act.

Generally, actions adjacent to the Installation (e.g., logging, clearcutting, urban development, etc.) will all continue to reduce and degrade available habitat for the RCW. However, there is no State or private land within the action area considered in this consultation. The land that the City of Columbus received in an exchange with Fort Benning will be developed in the near future; however, development was previously evaluated under formal section 7 consultation and is not part of the cumulative effects of this action. Consequently, the Service did not identify any state or private activities that are reasonably certain to occur within the action area that would constitute cumulative effects.

CONCLUSION

After reviewing the current status of the red-cockaded woodpecker, the environmental baseline including ongoing training activities, the effects of the proposed ESMC, and the cumulative effects, it is the Service's biological opinion that the implementation of the ESMC, as proposed, is not likely to jeopardize the continued existence of the RCW. No critical habitat has been designated for the RCW, therefore none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part

of the agency action is not considered a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by Fort Benning, for the exemption in section 7(o)(2) to apply. The Installation has a continuing duty to insure that the reasonable and prudent measures and terms and conditions are implemented fully. If the Installation fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Installation must report the progress of the action and its impact on the species to the Service in a yearly report provided to the Service's West Georgia Office. In the event of an unauthorized incidental take, Service should be notified immediately. Any suspected incidental take that was not previously authorized or other ESA violation will be reported similarly.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service anticipates the incidental take of 30 RCW groups over the 5 year-term of the ESMC. The various forms in which these anticipated takes could occur include group loss, bird loss, cavity tree and/or habitat loss, and harassment. Group level impacts and/ or neighborhood level impacts will be assessed when the Installation proposes specific clusters for consideration. For this ESMC, incidental take is anticipated in the following forms:

Amount or Extent of Take Anticipated (worse-case-scenario)

Proposed IT	Groups	Birds	Cavity Trees	Habitat Loss
K15	4	8	16	600
A20	8	16	32	1200
Fire	-	2	2	-
HMU-1	3	6	12	-
SRC to UC	15	30	-	-

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the RCW or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes that if the Installation follows the narrative in the ESMC, then there are no reasonable and prudent measures necessary and to minimize impacts of incidental take for RCWs.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, Fort Benning must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline required reporting/monitoring (R/M).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on a listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend implementation of the following conservation recommendations:

1. Consider shifting more resources toward home range assessments. Following birds and knowing their true territory size could reveal more habitat per group than what is currently partitioned by way of modeling territory sizes (Thiessen Polygons/ GIS applications). Currently, a significant number of RCW territories are pre-project deficient (PPD). The PPD territory condition influences current and planned projects in a way that commonly alters military training initiatives or increases the number of groups requiring incidental take. The number of groups incidentally taken impedes the Installations upward trend toward attaining its' population recovery goal, which in turn slows down the ability to lessen and remove training restrictions. Knowing true territory sizes could reveal that partitions are above the MSS (i.e., not PPD) and potentially providing more options for project planning, training scenarios, etc.

2. Consider re-establishing a burn plan team and process that includes the Service as an adviser. This may help to stabilize the process and provide a third part perspective. All burn decisions, including the reasoning that leads to the final strategies, could be added to the administrative record (burn plan). The narrative would provide transparency and defensibility for the decisions made in the planning process. Procedures and protocols could be developed as a means to help minimize the need for incidental take requests related to fire.

3. The Installation should insist that it receives all the completed "effects monitoring" reports for Transformation actions. It is stated throughout the ESMC that many final reports are pending. It is likely, that having these data finalized and available would not only benefit the Installation, but the Army as well.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the ESMC we received on June 23, 2014. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new

information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The above findings and recommendations constitute the report of the Department of the Interior. We appreciate the cooperation of your staff in the preparation of this biological opinion. If you have any questions about this opinion or consultation, please contact the Supervisory Biologist at the West Georgia Sub Office, Mr. John Doresky at (706) 544-6030.

Sincerely,

Donald W. Imm, PhD
Field Supervisor

cc: FWS, Fort Benning, GA ES
FWS, Atlanta, GA (ES/TE)
Will McDearman, FWS, Jackson, MS
GA DNR-WRD, Social Circle

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