



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

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March 16, 2005

Mr. Roderick A. Chisholm  
Director of Public Works  
Department of the Army  
Headquarters, U.S. Army Garrison  
Building 1001, Room W321  
Fort Hood, Texas 76544-5000

Dear Mr. Chisholm:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the U.S. Department of Army's (Army) ongoing activities and proposed revision of the Endangered Species Management Plan (ESMP) at Fort Hood Military Installation in Bell and Coryell Counties, Texas, and its effects on the federally listed black-capped vireo (*Vireo atricapilla*) (BCVI) and golden-cheeked warbler (*Dendroica chrysoparia*) (GCWA). The Army's letter requesting consultation, dated September 1, 2004, was received at our office on September 7, 2004. Following our request for additional information, the consultation was initiated on October 25, 2004.

As you are aware, formal section 7 consultation between the Service and the Army concerning Fort Hood originally began in 1992. At that time, the Service's Austin Field Office had responsibility for addressing endangered species issues at Fort Hood. The original biological opinion, dated September 23, 1993, was amended three times to accommodate the changing needs of the Army and incorporate new information regarding the conservation needs of the listed species occurring at Fort Hood. Due in part to recent resource limitations the Service has encountered and continues to experience, the responsibility for endangered species issues at Fort Hood was transferred to the Arlington Field Office in 2003.

In subsequent meetings with our office and Fort Hood staff, it became apparent that the Army wished to reassess the Fort's ESMP to better suit their mission, and therefore, we recommended the Army reinstate formal consultation. The initiative was to increase flexibility in training at Fort Hood, and as such, it was mutually agreed that a new biological opinion would be optimal, rather than another amendment to the previous opinion. While the previous opinion and its amendments would always remain a part of the consultation history and the administrative record, the new biological opinion would incorporate all ongoing activities that currently occur at Fort Hood, any proposed changes to the ESMP, an updated environmental baseline, the most

current status of the species, and a complete incidental take statement (in the event of a non-jeopardy opinion). The result would be a 'stand alone' document that could be easily referred to without reference to several other documents and/or amendments. To this end, my staff in close coordination with the Fort Hood staff, incorporated all elements necessary to complete this comprehensive biological opinion.

This biological opinion supersedes the previous opinion and its amendments. It has been prepared in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This biological opinion is based on the Biological Assessment (BA) included with your letter initiating consultation, information provided by Fort Hood Environmental staff, and other sources of information. A complete administrative record of this consultation is on file at the Service's Arlington, Texas, Field Office (ARLFO).

### **Consultation History**

- 1992 to 2000: The Army, Headquarters III Corps and Fort Hood, originally initiated consultation on September 24, 1992, with the Service's Austin, Texas, Field Office, which resulted in a non-jeopardy biological opinion issued on September 23, 1993 (Service Consultation #: 2-15-93-F-003). The opinion was subsequently amended twice in 1999, and a third time in 2000 to incorporate the draft 2000-2004 ESMP, impacts from the 1996 fires, additional brown-headed cowbird minimization measures, off-road vehicle recreation, and juniper management.
- June 2003: Responsibility for endangered species issues concerning Fort Hood is transferred from the Service's Austin Office to the ARLFO.
- January 15, 2004: Initial meeting at Fort Hood to discuss changes to the ESMP with representatives from the ARLFO, Texas Parks and Wildlife Department, Texas Department of Agriculture, The Nature Conservancy, and the Leon River Restoration Project. The Army's training requirements and need for flexibility with regard to listed species encroachment, as well as plans for an off-site conservation plan were discussed. A working group was formed with representatives from each group (hereafter, ESMP Working Group) to work on the conservation plan and the revision of the Fort's ESMP.
- January 27, 2004: Meeting at Fort Hood with ESMP Working Group. Current off-site efforts through the Nature Conservancy and potential changes to the ESMP with regard to fires within the Live Fire Area were discussed. Omar Bocanegra explained the off-site plan's relationship to section 7(a)(1) and 7(a)(2) of the Act, and encouraged the Army to draft a BA with respect to changes to the current activities and/or restrictions. The BA would then be used to re-initiate consultation to address the Army's training needs and minimize impacts to listed species.

- March 25, 2004: Meeting at Fort Hood with ESMP Working Group. Proposals for off-site conservation were submitted by The Nature Conservancy, Environmental Defense, and the Leon River Restoration Project and discussed among the group. The Army discussed a draft outline of proposed changes to the ESMP.
- July 7, 2004: Meeting at Fort Hood with the Directorate of Public Works, Service, and Leon River Restoration Project representative. The ARLFO explained the consultation process to Colonel Randall Butler and staff. The Army expressed interest in expediting the consultation and indicated the draft BA was near completion.
- July 20, 2004: The ARLFO received the draft BA via electronic mail from the Army. Comments on the draft were sent to Fort Hood on August 3, 2004.
- September 7, 2004: The ARLFO received a final BA with letter requesting formal consultation with the Army on activities at Fort Hood. The ARLFO acknowledged receipt of the initiation request and asked for clarification on issues related to prescribed fire, recreational activities, and the grazing lease at Fort Hood in a letter dated October 4, 2004.
- October 25, 2004: The ARLFO received a letter from Colonel Bruzese providing supplemental information on the BA as requested. The ARLFO accepted the consultation beginning October 25, 2004, in a letter to Colonel Bruzese, dated October 28, 2004.

## **BIOLOGICAL OPINION**

### **I. Description of Proposed Action**

Fort Hood Military Reservation (hereafter, Fort Hood) provides resources and training facilities for active and reserve units in support of the Army's mission. Training activities conducted at Fort Hood include maneuver exercises for units up to brigade level, live weapons firing, and aviation training. In accordance with Army Regulation 200-3, Fort Hood has prepared and implemented an ESMP to promote the conservation of threatened and endangered species occurring on the installation while minimizing impacts on the training mission. The current ESMP was approved on October 10, 2000.

The proposed action consists of the ongoing military associated and other activities at Fort Hood and revision of the current installation ESMP. The Army and the Department of Defense (DoD) are currently undergoing major reviews of force structure and deployments under several transformation initiatives and the current round of Base Realignment and Closure activities. The ultimate outcome of these initiatives and consequences for Fort Hood, if any, are not known at this time. Also, if significant changes to the Fort Hood force structure or mission occur, these changes may not be implemented for several years. For these reasons, this project description

reflects the current force and mission structure. The action area of the proposed and ongoing actions is limited to within the boundaries of Fort Hood.

## **A. Ongoing Activities**

Ongoing activities at Fort Hood consist of military training activities, endangered species management, recreation programs, prescribed fire, juniper control program, cattle grazing, brown-headed cowbird (*Molothrus ater*) control program, management for other sensitive species, and population monitoring and research. No substantial changes are proposed for these ongoing activities; however, because the proposed changes to the ESMP directly or indirectly involve these activities, they are discussed under this project description for inclusion in the “Effects of the Action” section of the biological opinion.

### **Maneuver Training**

Maneuver training exercises are conducted at all unit levels to ensure a combat ready fighting force. Training programs focus on units attaining and maintaining proficiency in collective tasks that support mission essential tasks. Units involved in the training process span all echelons from section to corps. III Corps' primary training focus at Fort Hood is the brigade level and below. Training exercises replicate combat conditions as closely as possible. Combat effects such as smoke, noise, and simulated nuclear, biological, and chemical conditions are integrated into every training event to condition units for operations in a difficult, stressful battlefield environment.

Units train for combat in a task-oriented manner. Trainers integrate combat, combat support, and combat service support elements to conduct multi-echelon, combined arms training. Combined arms training involves formations that include members of the entire fighting force. Commanders synchronize the activities of these forces within a battlefield framework that includes maneuver and operations within the deep, the close-in, and rear battle areas. Such exercises involve greater depth and rapidity of movement dimensions and, therefore, also incur greater demands for concurrent land use.

Maneuver training areas are located west, east, and southwest of the Live Fire Areas (Figure 1). Maneuver training areas constitute 53,300 ha (131,707 ac) or 61 percent of the entire installation. The West Range Maneuver Training Areas (Land Groups 4-6) provides excellent training opportunities for large armored and mechanized infantry forces. The training area averages seven to 10 km (4.3 to 6.2 mi) east to west and 30 km (18.6 mi) north to south. The area features a wide variety of terrain and vegetation characteristics that greatly enhance cross country, combined arms maneuver. Because of its large, contiguous size, this is the only maneuver area on Fort Hood capable of supporting brigade level operations.

The Northeast (Land Groups 1 and 2) and Southeast Range Maneuver Training Areas (Land Group 3) are divided by Belton Lake Reservoir. The northeast sector is heavily vegetated and cross-compartmentalized by terrain features, providing limited value as a mechanized maneuver area. The southeast sector provides more favorable terrain for mechanized units, but is only four to seven km (2.5 to 4.3 mi) north to south and 15 km (9.3 mi) from east to west. Because of

limited area, the Northeast and Southeast Range Maneuver Training Areas are best suited for unit assembly and logistical areas, artillery firing points, and company and platoon level mounted and dismounted training. Additionally, these eastern training areas support engineer, combat support, and combat service support training, and provide locations for amphibious and river crossing operations.

The Southwest Maneuver Training Area is not used for maneuver training due to its small size and isolated location. The Southwest Maneuver Training Area (Land Group 7) is separated from the main cantonment area by U.S. Highway 190. This training area includes many restricted areas, including Robert Gray Army Airfield and the Ammunition Supply Point. The Southwest Maneuver Training Area is used primarily for small mechanized unit and dismounted infantry training and for logistical sites.

### **Live-fire Training**

Fort Hood units train with the most modern and sophisticated weapon systems available. Fort Hood uses a Five-Year Range Modernization Program to manage upgrades and expansion of existing facilities and new construction projects to meet future training and evaluation requirements. Live-fire training facilities are located primarily in Live Fire Areas (LF) 80-93 and Permanent Dudded Area (PD94; Figure 1).

The Live Fire Areas and PD94 cover about 24,000 ha (59,305 ac) in the central portion of the installation, bounded on the east, west, and south by the East Range, West Range, and South Range roads respectively. Direct fire occurs inside these roads, and is directed towards the Artillery Impact Area and other target arrays. Indirect fire from artillery and Multiple Launch Rocket Systems is directed from numerous locations in surrounding maneuver areas. Much of the Live Fire Area provides a buffer zone for PD94 and has limited impacts from exploding ordnance. The Live Fire Areas provide training and evaluation facilities for all individual, crew-served, and major weapons systems, up to and including brigade live-fire. These Live Fire Areas are used by all active units assigned to III Corps and Fort Hood, as well as by attached units from the Army National Guard and the Army Reserve.

Modernized live-fire training facilities require continuous maintenance to maximize range design capability. Sensor devices must be serviced and cleared of concealing vegetation to ensure unimpaired operation. Target arrays must be visible at maximum engagement ranges. A program of range maintenance to routinely clear vegetation from target arrays and sensor devices is a critical component of range operation.

### **Aviation Training**

Fort Hood has one of the largest military aviation commands in the United States. The aircraft, primarily rotary-wing, are some of the most modern and sophisticated in the world. Aviation units on Fort Hood train at all echelons from individual through battalion/squadron.

The training tasks accomplished in the training areas (Figure 1) include all tactical maneuvers in accordance with each aircraft's aircrew training manual and the unit's standard operating

procedures. This includes nap-of-earth, contour, and low level flight. Fixed-wing aircraft of the Air Force and Air National Guard also conduct training missions in Fort Hood air space and use impact areas on the installation for weapons delivery practice.

Two major airfields are located on Fort Hood. The Hood Army Airfield is a 293 ha (724 ac) area located at the eastern end of the cantonment area. Hood Army Airfield is the primary airfield for rotary-wing air operations and has a 1,436 m (4,712 ft) runway. Robert Gray Army Airfield is an 867 ha (2,142 ac) area located at West Fort Hood with a 3,050 m (10,000 ft) runway. Several dirt landing strips are located on the installation for tactical air supply and support training.

Aircraft gunnery for AH-64 units is conducted on multi-purpose training ranges and PD94. However, the Dalton-Henson Range Complex (LF 80-82) is used most often for this training. Hellfire Missile Shots are conducted at Blackwell Multi-Use Range's Impact Area (PD94). Helicopter Door Gunnery is primarily conducted at Dalton Mountain Range or Crittenburger Range (LF 85-86). National Guard and Army Reserve units use the Dalton-Henson Range Complex for aviation training.

### **Operational Testing**

Fort Hood's large maneuver and Live Fire Areas, coupled with III Corps modernized force, provide excellent conditions for operational testing of various weapons, equipment, and doctrine. The U.S. Army Operational Test Command (OTC) is a tenant activity located at West Fort Hood directly involved in training, doctrine, and combat development of the products that soldiers use on a daily basis and will use on the future battlefield. Most OTC tests employ "user testing," allowing front-line soldiers to try out new equipment or concepts. The tests generally encompass activities similar to those described in the sections on maneuver, live-fire, and aviation training.

### **Controlled/Prescribed Burning**

Prescribed fire is a natural, economical, and effective management practice in some ecosystems. During the past 150 years in Texas, fire suppression practices have contributed substantially to the ecological imbalance of endangered species habitats. In many instances, properly applied fire can be one of the better tools to correct this problem. Fire presents a particular dilemma for the management of the BCVI and GCWA (collectively referred to as endangered species) on Fort Hood. Recovery times differ for GCWA and BCVI habitats after a stand-replacing fire. GCWA habitat that burns on Fort Hood generally regenerates first as BCVI habitat. Fire plays an important role in management of endangered species habitats on Fort Hood.

During extremely hot and dry conditions in late February 1996, approximately 2,728 ha (6,741 ac) of endangered species habitat were burned by wild fires on Fort Hood. This included about 2,313 ha (5,715 ac) of GCWA habitat and 415 ha (1,025 ac) of BCVI habitat. The GCWA habitat that burned substantially converted to BCVI habitat during the subsequent 2-5 years. New fire protection policies have been implemented on Fort Hood as a result of the 1996 fires and consultation with the Service.

Current prescribed fire policy emphasizes reduction of fuel loads in grasslands surrounding endangered species habitats on Fort Hood. Reduction of fuel loads mitigates the threat of wild fire damage in these habitats. Prescribed burns are managed through the Fort Hood Natural Resources Branch. Other objectives of the installation prescribed fire program are to reduce encroachment of Ashe juniper in all range sites, improve vegetation composition and improve wildlife habitats.

### **Juniper Cutting**

After the listing of the GCWA in May 1990, juniper cutting on Fort Hood was suspended temporarily following informal consultation with the Service. Since Ashe juniper is an essential component of the habitat for this endangered species, it was determined that juniper cutting could have a negative impact.

During the period 1997-2000, under an agreement with the NRCS, Fort Hood resumed mechanical clearing of juniper in old-field and other areas not occupied by GCWA. These control efforts were focused on juniper removal on West Maneuver Training Areas and resulted in clearing juniper from approximately 14,500 ha (35,830 ac) of old fields and other non-endangered species habitat areas. All control efforts and contracts were coordinated through the Fort Hood Natural Resources Branch to avoid impact on endangered species habitats. Control efforts were not allowed within a 100-m (328-ft) buffer around endangered species habitats.

### **Grazing**

Cattle grazing is permitted on Fort Hood under a lease agreement with the Central Texas Cattlemen's Association. The current lease extension expired September 15, 2004. This lease provides grazing opportunities on 80,000 ha (197,684 ac) of Fort Hood land. Negotiations are currently underway for a new lease. Under the new agreement, stocking rates are driven by the results of annual forage inventories. Grazing is deferred or stocking rate is reduced where forage production fails to meet thresholds that allow for training impacts and land management practices such as prescribed burning. The lease agreement requires the lessee not to impact endangered species, historical, archaeological, architectural, or other cultural features on the installation, and requires compliance with local, state, and federal water pollution regulations. A Supplemental Environmental Assessment (SEA) and 'Finding of No Significant Impact' for the Fort Hood grazing program was issued in January 2004. On February 22, 2005, an additional supporting document titled "Points of Agreement Regarding Methodology for Calculating Animal Units for Grazing at Fort Hood, Texas" was signed by representatives from the Army, Fort Hood, and the Texas Department of Agriculture. The methodologies outlined in this agreement will be used to determine the cattle stocking rate on the Fort based on available forage as discussed above, thus providing an adaptive management feature that will assist in minimizing impacts to listed species.

### **Cowbird Control Program**

Fort Hood conducts extensive operations to reduce numbers of brown-headed cowbirds on the installation. The objective of the control program is to maintain the incidence of cowbird

parasitism of BCVI nests below 10 percent annually, averaged over five-year periods. This program implements trapping and shooting activities that target feeding concentrations of cowbirds throughout the installation and cowbird individuals in endangered species nesting habitat. Summers and Norman (2004) provide details on the current implementation of the control program. In 2004, over 2,700 female brown-headed cowbirds were removed on Fort Hood during the GCWA/BCVI nesting season. Incidence of cowbird parasitism on BCVI nests in intensive study areas in 2004 was four percent.

## **Recreation**

The post is open to public hunting and fishing. Access is regulated by the Range Control Division, Area Access office with the cooperation of Morale Support Activities and the Natural Resources Branch. Over 80,500 ha (198,920 ac) are managed for fish and wildlife, including 100 surface ha (247 surface ac) of lakes and ponds, 88 km (54.7 mi) of rivers and permanent streams, and 85 km (52.8 mi) of shoreline access to Belton Lake. In recent years, the installation has provided 90,000 fisherman-days and 45,000 hunter-days annually. White-tailed deer, wild turkey, migratory waterfowl, northern bobwhite, and mourning dove are hunted during restricted seasons. Deer and turkey hunts are carefully controlled. Small game hunting with shotgun is available in accordance with State of Texas seasons and bag limits.

Various low-impact outdoor recreation activities take place at the Belton Lake Outdoor Recreation Area located adjacent to TA 36. These include a swimming beach, camping, boating, trail bicycling, and cottage use. Boy Scout Camps are located in TA 36 and LTA 203. Hiking and nature observation activities are also allowed on many parts of the installation and are coordinated through Range Control Division. Mountain bike riding is restricted to a designated trail system at Belton Lake Outdoor Recreation Area. No off-road recreational vehicle use is permitted anywhere on the installation.

## **Management of other Sensitive Species**

Fort Hood maintains an active program to monitor, manage, and protect sensitive natural resources and populations occurring on the installation. These include transient occurrence of endangered bald eagles and whooping cranes, a rare plant *Croton alabamensis*, several species of endemic karst invertebrates, and recently discovered new species of salamander, *Plethodon* sp.

The priority for management and protection of other sensitive species on Fort Hood is to minimize factors that could lead to future listing actions for these species. *Croton alabamensis* populations are visited annually to assess population status and monitor potential threats. At this time these locations are not disturbed by military training activities.

Fort Hood has an extensive network of karst features. In the 1990s extensive faunal surveys identified several endemic karst-associated invertebrates. Fort Hood implemented protective measures such as gating of caves to minimize human impacts on these populations. Surveys and mapping of caves are ongoing. Research has been conducted on populations status and effect of fire ant depredation on these systems. Fort Hood is currently developing a formal karst management plan.

## **Population Monitoring and Research Programs**

Population monitoring programs on Fort Hood are established on the basis of adaptive management principles. Monitoring programs have been conducted on Fort Hood for both GCWA and BCVI since these species were listed. These programs have evolved over the years in response to new data requirements and management initiatives. Overall objective of the monitoring program is to determine population trends, demographic parameters, and effectiveness of management initiatives. Monitoring activities include intensive population and demographic data collection on selected intensive study areas, base-wide point counts and other targeted data collection activities. Details of the current monitoring program are found in The Nature Conservancy of Texas's 2004 Annual Report. Monitoring activities are assessed annually and adjusted as necessary to provide the best evaluation of population status and management practices.

Fort Hood also supports and hosts a variety of research efforts on endangered species populations on the installation. Fort Hood, the Army, and DoD support significant research programs to evaluate factors affecting endangered species populations on the installation including human disturbance, predator effects, noise impacts and habitat suitability. Many of these research efforts are currently in progress and results will be incorporated in future management approaches and policies.

Current information indicates that feral hogs have been increasing in abundance at Fort Hood and may influence the composition, succession, and quality of endangered species habitat. The extent of the effects feral hogs may have on endangered species habitat is unknown, but anecdotal evidence suggests that large populations of hogs could have both long and short term adverse impacts on endangered species. To address this problem, Fort Hood has recently begun controlling feral hogs through trapping and aerial shooting.

As a part of the endangered species population monitoring program, Fort Hood employs the use of helicopter over-flights to ensure compliance with training guidelines, observe the effects of training activity in endangered species habitat, control feral hogs, and monitor the presence and spread of oak wilt. Fort Hood's use of helicopter surveillance is an effective means of monitoring the available habitat, as well as providing aerial support for fighting fires that threaten habitat.

Fort Hood reports the status and results of these monitoring and research programs annually to the Service. Results are also presented at national symposia and through publication in peer-reviewed publications.

### **B. ESMP Revision**

Changes to the ESMP are proposed to better suit the Army's mission and incorporate the most current information regarding the status and distribution of the BCVI and GCWA at Fort Hood and the effects of military and other activities on these species. The proposed changes are: (1) modification of current fire management and protection policy within Live Fire Areas, (2) reduction of habitat area designated as "core" for BCVI and GCWA subject to Fort Hood

Endangered Species Training Guidelines, and (3) projected habitat loss due to facility construction and maintenance activities. These actions are described in further detail below.

## **1. Fort Hood Fire Management and Protection Policies**

Fort Hood currently has a fire danger rating system to alert trainers when pyrotechnic operation should be limited or halted based on current (daily) weather and estimated moisture content of vegetation and soil. Details of this rating system are found in OPLAN 8-93, “Operation Brush Fire” and Fort Hood Regulation 350-40. These fire ratings are:

**Condition Green:** No restrictions on training. Troops may use pyrotechnics and incendiary munitions for training.

**Condition Amber:** Caution must be taken in use of pyrotechnics. Aerial flares are not to be used outside the impact area. Other pyrotechnics are to be used only in roadways, tank trails, in areas clear of vegetation, or in containers.

**Condition Red:** No pyrotechnics or incendiary munitions authorized for training purposes.

**Condition Red with Waiver:** Once a risk assessment is conducted by Range Control and the recommendation for training with waiver is approved by the Director, Range Control, specific restrictions are imposed on training units.

Currently, under all fire condition ratings, fires are reported to Range Control by military units or installation personnel. If the fires are within range fans where live-fire training is being conducted, units will cease firing until a fire risk assessment is conducted or control measures are implemented. Range Control will determine the location of the fire and risk to facilities, personnel, or sensitive resources such as endangered species habitats. If Range Control determines there is no risk to facilities or habitats, the fire will be allowed to burn. Typical examples are fires occurring in the permanently-duded impact area (PD94; Figure 1) where fires are extremely frequent and fuel loads are low. If a fire may risk endangered species habitat, Range Control will contact the installation Natural Resources Branch for an assessment of the risk based on proximity to high hazard areas, fuel load, topography and other parameters. If the fire risk to habitats is obviously high, Range Control may immediately implement fire control actions concurrent with notification of the Natural Resources Branch.

Under current procedures, fire control will be implemented under all fire condition ratings if a determination is made that endangered species habitat is at risk from a fire. Within the Live Fire Areas, the first response is usually by a contracted helicopter on standby for fire control. Under condition Red this helicopter is on 30-minute standby during 1100-1800 and two-hour standby during the rest of the day/night period. Other installation fire fighting assets are available for fire control as needed.

The proposed action would reduce requirements to conduct intensive fire suppression in Live Fire Areas during conditions Green and Amber. Fort Hood would establish a “let burn” policy

for range fires that occur during periods when Fire Danger Rating is Green or Amber. Under Green and Amber ratings, fires would be allowed to burn in all habitat areas within the Live Fire Area unless there is obvious threat to personnel or facilities or until such time as changing environmental conditions warrant implementing increased fire control procedures.

In order to minimize potential impacts to endangered species habitat resulting from the proposed revisions to the Fort Hood Fire Management and Protection Policies, Fort Hood proposes the following measures:

- Fort Hood will monitor effects of all fires on endangered species habitat occurring on the installation. Fort Hood will maintain records on the date and area of endangered species habitat affected, and report these data annually to the Service. Fort Hood will allow safe and sufficient access to Live Fire Areas by Natural Resource Branch personnel and contracted biologists to monitor BCVI and GCWA productivity, predation, and population trends in these areas.
- Fort Hood will emphasize use of preventative prescribed fire to maintain blacklines near habitat areas annually. Fort Hood will employ firebreaks in association with endangered species habitats to reduce fire risk.
- Fort Hood will continue to use aerial support (helicopter) for fighting fires that pose a threat to important GCWA habitat areas.

Additionally, Fort Hood would implement habitat management prescriptions to maintain installation population goals for both BCVI and GCWA. The Fort would maintain suitable habitat to support 1,000 adult BCVI males and 2,000 adult GCWA males at maximum densities. GCWA habitat that burns on Fort Hood typically regenerates in the short-term as BCVI habitat. BCVI habitat on Fort Hood that is not periodically disturbed over time will become unsuitable for BCVI occupancy and may ultimately regenerate to GCWA habitat. The temporal and spatial pattern of fires and other disturbance creates a dynamic relationship between the availability of BCVI versus GCWA habitat.

This relationship between disturbance regimes and habitat suitability presents a challenge to installation natural resource managers to determine when and where habitat management prescriptions should be implemented to support the installation's overall endangered species population goals. Under the proposed action, Fort Hood would determine criteria and identify areas suitable for maintenance as BCVI habitat. Management prescriptions to maintain adequate areas of suitable BCVI habitat would rely first on passive management activities such as habitat creation and maintenance through the "let-burn" policy and mechanical disturbance from training activities. Secondly, active management practices such as prescribed burns and mechanical clearing would be implemented as necessary to maintain installation population goals for BCVIs (see Ongoing Activities section).

## **2. Reduce Area Designated as ‘Core’ Habitat**

Currently, 4,184 ha (10,339 ac) of BCVI habitat and 14,879 ha (36,767 ac) of GCWA habitat are designated as “core” habitat. Under this designation, training activity in habitats designated as core is subject to conditions of the Fort Hood Endangered Species Training Guidelines (Appendix A). These guidelines prohibit fixed activities greater than two hours duration in designated core habitats during the period 1 March through 31 August. Vehicle traffic is restricted to existing roads and trails in core habitats.

Under the proposed action, core habitat designation would be removed from all 4,184 ha (10,339 ac) of BCVI habitat, and core habitat designation for GCWA would be reduced to 3,861 ha (9,541 ac). For GCWA, core habitat designation would be implemented in habitats occurring in the East Ranges (land groups 2 and 3) as shown in Figure 2. Core habitats under this proposed action would constitute all GCWA habitats east of a water pipeline and north of Belton Lake, and habitats north of North Nolan Road and south of Belton Lake. The latter core habitat area includes the Belton Lake Outdoor Recreation Area and a long-term GCWA intensive monitoring study plot. Additionally, the time period for implementing Level 2 restrictions (Appendix A) would be reduced to 1 March through 30 June.

In accordance with principles of adaptive management, Fort Hood would implement or restructure monitoring programs to assess long-term effects, if any, of this action on endangered species populations and habitats on the installation. Designation of habitat as “core” or “non-core” is not a good indicator of the duration, frequency or intensity of training activity at any particular location under these designations. Because any level of transient activity is still allowed in core habitats, locations within these areas may still be subject to a high level of training activity. Conversely, depending on the training footprint, habitats designated as non-core may be subject to very little training activity at any particular location. For these reasons, monitoring programs to determine the relationship between training activity and long-term population and habitat trends would require some measure or index of training activity in association with study populations. Currently, an analysis is being conducted to assess historical differences in endangered species populations between currently designated core and non-core habitats. These analyses will be provided to Fort Hood prior to the 2005 breeding season for consideration in implementing programs to monitor long-term effects of training activity on endangered species populations and habitats.

Other DoD and Army research programs that directly address effects of military training activities on endangered species populations are currently ongoing or programmed for implementation. Although Fort Hood has no control or funding authorization for these research programs, the installation does provide technical review, site access and logistical support for these activities. Under this proposal, Fort Hood would continue to support execution of these research activities and would ensure that results are provided to the Service for review.

Off-site conservation and protection of endangered species habitats also provides an opportunity to offset potential effects of mission activities on Fort Hood. In FY04, Fort Hood provided funds in support of voluntary short-term habitat management through the Leon River Restoration Project, and funding to support permanent conservation easements and long-term Safe Harbor

agreements through The Nature Conservancy and Environmental Defense. Fort Hood will continue to collaborate with other governmental and non-governmental agencies to identify off-site opportunities for habitat conservation and protection, particularly those covenants that will contribute toward species recovery goals as defined under the Act. Fort Hood will provide logistical and financial support for these activities contingent upon availability of funds.

### 3. Construction and Range Improvements.

Currently, construction and range improvement projects on Fort Hood that potentially eliminate endangered species habitat require individual consultations with the Service. Under the proposed action a programmatic incidental take would be established to cover anticipated take of habitat over a five-year period due to military construction and range improvement activities.

Master planning documents for major construction over the next five years anticipate a number of multi-purpose range upgrades, additional targetry, urban assault training facilities, and habitat alterations for tactical training land improvements such as tank trail construction and brush clearing for visibility. Table 1 shows examples of the types of projects anticipated under the current five-year master planning cycle. Current estimates are that endangered species habitat loss due to these activities during the next five-year master planning cycle would not exceed 325 ha (803 ac). Projected estimates are that approximately 2/3 (217 ha [536 ac]) of this total area would be GCWA habitat with the remaining habitat loss (108 ha [267 ac]) comprised of BCVI habitat.

| <b>Table 1. Examples of anticipated construction and range improvement projects during the next five-year planning cycle at Fort Hood, Texas. Refer to Figure 1 for action area locations.</b> |                              |
|--|------------------------------|
| <b>Project Title</b>   | <b>Proposed Action Areas</b> |
| Killeen-Fort Hood Joint Military/civilian Use Airport expansion  | West Fort Hood (WFH)         |
| Browns Creek Digital Multipurpose Range Complex  | LF 83                        |
| Lone Star Range Upgrades   | LF 82                        |
| Brookhaven Scout Qualification Range   | LF 88                        |
| Dalton/Henson Mountain Aviation Qualification Range  | LF 80, 81, 82                |
| Sugarloaf Digital Range Complex  | LF 88, 89                    |
| Blackwell/Pilot Knob Digital Multipurpose Range  | LF 90                        |
| Military Operations Urban Terrain/combined arms Combat Training Facility   | LF 92, 93                    |
| Construction/Replacement of Primary and Secondary Tank Trails  | Training Areas (TA)          |

Most of the anticipated construction and range improvement projects such as those shown in Table 1 are located within or immediately adjacent to Live Fire Areas (Figure 1). The range

complex projects are examples of these. Examples of projects outside the Live Fire Areas include the Killeen-Fort Hood airport expansion and construction of tank trails. It is not anticipated that the entire project area for any of these projects would be completely within endangered species habitats, but it is anticipated that some level of habitat loss may be associated with these project actions.

The anticipated programmatic take under this proposal is based on historical requirements for similar projects, the likely footprints of projects in more advanced planning stages, and the level of anticipated construction activity. The actual take may not reach levels established under this programmatic proposal. All projects are subject to environmental review early in the planning stage to minimize impacts on sensitive natural and cultural resources. This planning requirement may result in take below the maximum anticipated levels. Likewise, unforeseen mission requirements may require proposed projects that could exceed take anticipated under this programmatic proposal. In this case, Fort Hood would need to enter into consultation with the Service for any projects that would exceed programmatic take anticipated under this proposal.

Improved and new tank trail construction may allow increased access to endangered species habitats (see Effects of the Action section). In Fort Hood’s review and revision of monitoring programs, consideration would be given to determining changes in vehicle access and use of endangered species habitats.

## II. Status of the Species

The current list of federally threatened, endangered, and candidate species that are known to occur, or have been documented in Bell and Coryell Counties is presented in Table 2. Candidate species are not afforded federal protection under the Endangered Species Act; however, the Service recommends that potential impacts to these species be considered during project planning.

| <b>Table 2. Federally listed species known to occur in Bell and Coryell Counties, Texas.</b> |                                 |               |               |
|--|---------------------------------|---------------|---------------|
| <b>Common Name</b>   | <b>Scientific Name</b>          | <b>Status</b> | <b>County</b> |
| black-capped vireo   | <i>Vireo atricapilla</i>        | Endangered    | Bell, Coryell |
| golden-cheeked warbler   | <i>Dendroica chrysoparia</i>    | Endangered    | Bell, Coryell |
| whooping crane   | <i>Grus americana</i>           | Endangered    | Bell, Coryell |
| bald eagle   | <i>Haliaeetus leucocephalus</i> | Threatened    | Bell          |
| Salado salamander  | <i>Eurycea chisholmensis</i>    | Candidate     | Bell          |
| smalleye shiner  | <i>Notropis buccula</i>         | Candidate     | Bell          |

Currently, there are no known populations of the Salado salamander or smalleye shiner on Fort Hood. Additionally, habitat for these species does not occur within the action area.

Whooping cranes and bald eagles are transient on Fort Hood with documented occurrences along the shoreline and flood plain of Belton Lake. Fort Hood management policy for bald eagles is to

minimize disturbance from low-level helicopter flights and other aviation assets. When bald eagles are observed in autumn the Fort Hood air-space coordinator is notified and a no-fly zone is implemented. This zone is located near Belton Lake in Land Group 2 and LTA 115. Flight restrictions are lifted when no bald eagles have been observed for a period of two weeks.

Observations of whooping cranes are uncommon on Fort Hood. In the event that this species is observed on the installation, the installation Director of Operations, Range Control Division, will be notified and training activities will be suspended in proximity to whooping cranes until they have departed installation lands.

Under the proposed action the current protection and reporting policies for these species would remain in affect. For these reasons, it is anticipated that the proposed action is not likely to affect the bald eagle or whooping crane, and therefore, these species are not considered further in this biological opinion.

Two federally listed endangered species that do occur in the action area and that may be affected by the proposed action are the BCVI and GCWA. The BCVI was listed by the Service in 1987 (52 FR 37420-37423). The Service emergency listed the GCWA on May 4, 1990 (55 FR 18844) and published a final rule on December 27, 1990 (55 FR 53153-53160). Critical habitat has not been designated for either of these species. The recovery plans for the BCVI and for the GCWA were finalized on September 30, 1991, and September 30, 1992, respectively.

**Black-capped Vireo** - The BCVI is an 11.4 centimeter (4.5 inch) long, insect-eating songbird. Mature males are olive green above and white below with faint greenish-yellow flanks. The crown and upper half of the head is black with a partial white eye-ring. The iris is brownish-red and the bill black. The plumage of the female is duller than the male. Females have a dark slate gray head (USFWS 1991).

BCVIs arrive in Texas from mid-March to mid-April, while BCVIs in Oklahoma arrive approximately 10 days later. They nest from Oklahoma south through central Texas to the Edwards Plateau, then south and west to central Coahuila, Mexico. A pair will most often be monogamous for the breeding season, selecting a nest site together, while the female completes nest construction in two to three days. BCVIs suspend their nests in the forks of shrubs in dense underbrush, from 0.3 to 0.9 meters (1 to 6 feet) above the ground; most nests are found around one meter (3.3 feet) above ground. Three to four eggs are usually laid in the first nesting attempt, but later clutches may only contain two to three eggs. The first egg is usually laid one day after nest completion, with one egg being laid each subsequent day. Incubation takes 14 to 17 days, and is shared by both the male and female. BCVI chicks are fed by both adults as well, and leave the nest 10 to 12 days after hatching (Campbell 1995).

Although BCVI habitat throughout Texas is quite variable with respect to plant species, soils, and rainfall, all habitat types have a similar overall appearance. BCVIs typically inhabit shrublands and open woodlands with a distinctive patchy structure. The shrub vegetation generally extends from the ground to about 1.8 meters (6 feet) above ground and covers about 30% to 60% of the total area. Open grassland separates the clumps of shrubs. In the eastern portion of the BCVI's range, the shrub layer is often combined with an open, sparse to moderate

tree canopy. In the Edwards Plateau and Cross Timbers regions, common plants in BCVI habitat include Texas red oak (*Quercus buckleyi*), Lacey oak (*Quercus glaucooides*), white shin oak (*Quercus sinuata* var. *breviloba*), Durand oak (*Quercus durandii*), Plateau live oak (*Quercus fusiformis*), Texas mountain laurel (*Sophora secundiflora*), evergreen sumac (*Rhus virens*), skunkbush sumac (*Rhus trilobata*), flameleaf sumac (*Rhus lanceolata*), Texas redbud (*Cercis canadensis* var. *texensis*), Texas persimmon (*Diospyros texana*), honey mesquite (*Prosopis glandulosa*), and agarita (*Berberis trifoliolata*). Densities of Ashe junipers (*Juniperus ashei*) are usually low. In the western Edwards Plateau and Trans-Pecos regions, BCVIs are often found in canyon bottoms and slopes containing plants such as sandpaper oak (*Quercus pungens*), white shin oak, Texas kidneywood (*Eysenhardtia texana*), Mexican walnut (*Juglans microcarpa*), fragrant ash (*Fraxinus cuspidata*), mountain laurel, and guajillo (*Acacia berlandieri*). BCVI habitat is related to disturbance, and thought to have been created by natural disturbances (e.g., fires) in areas with rocky substrates and shallow soils, which generates successional habitat (Kolozsar et al. 2000).

Threats to the BCVI include habitat loss and degradation due to development, habitat succession, poor grazing practices, brown-headed cowbird (*Molothrus ater*) parasitism, and low reproductive success. Throughout the Hill Country, much of the BCVI's habitat has been destroyed or degraded by residential and commercial development, grazing practices, and fire suppression.

BCVIs may live for more than five years, and usually return year after year to the same territory. The birds begin to migrate to wintering grounds on Mexico's western coast in July, and are gone from Texas by mid-September (Campbell 1995).

**Golden-cheeked Warbler** - The GCWA is a small, insectivorous songbird, 11.4 to 12.7 centimeters (4.5 to 5 inches) long, with a wingspan of about 20 centimeters (7.9 inches). The male has a black back, throat, and cap, and yellow cheeks with a black stripe through the eye. Females are similar, but less colorful. The lower breast and belly of both sexes are white with black streaks on the flanks (USFWS 1992).

The GCWA nests in the juniper-oak woodlands of the Texas Hill Country and winters in the pine-oak woodlands of southern Mexico, Guatemala, Honduras, and Nicaragua. Its entire nesting range is confined to 33 counties in central Texas. Typical nesting habitat is found in tall, dense, mature stands of Ashe juniper mixed with deciduous trees such as Texas red oak, Lacey oak, white shin oak, live oak, post oak (*Quercus stellata*), Texas ash (*Fraxinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), escarpment cherry (*Prunus serotina*), and pecan (*Carya illinoensis*). This type of woodland is often found in relatively moist areas such as steep-sided canyons and slopes. GCWAs are also occasionally found in drier, upland juniper-oak, i.e., live oak, post oak, blackjack oak (*Quercus marilandica*) woodlands over flat topography. Although the composition of woody vegetation may vary from place to place, Ashe juniper, which is necessary for nest construction, is always present.

The males arrive in central Texas in early March and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. The females arrive a few days later but are more difficult to detect in the dense woodland habitat.

Usually three or four eggs are laid. The average nest height is five meters (16.4 feet) above ground. Eggs are generally incubated in April and, unless there is a second nesting attempt, nestlings fledge in May to early June. Migration south to the wintering grounds occurs in July and early August.

The primary threats to the GCWA are habitat loss and urban encroachment. Other factors include the loss of deciduous oaks (used for foraging) to oak wilt, nest parasitism by brown-headed cowbirds, and predation and competition by blue jays (*Cyanocitta cristata*) and other urban-tolerant birds (USFWS 1992).

### **III. Environmental Baseline**

#### **A. Description of the action area**

Fort Hood dates to 1942 when the Army established Camp Hood to prepare soldiers for tank destroyer combat during World War II. Renamed Fort Hood, it became a permanent installation in 1950. Various armored divisions have been assigned to Fort Hood since 1946.

Fort Hood is the only installation in the United States currently assigned two divisions. The installation provides the infrastructure and training lands for the 1st Cavalry Division and the 4th Infantry Division (Mech), III Corps Headquarters and its combat aviation assets, combat support, and combat service support units. With increased emphasis on force structure changes and Base Realignment and Closure initiatives, Fort Hood will likely remain the largest active U.S. installation in terms of assigned personnel. Total assigned personnel authorization is approximately 50,000 soldiers.

Fort Hood encompasses approximately 87,890 ha (217,180 ac) in Bell and Coryell Counties in central Texas. It lies at the northern extent of the Edwards Plateau and entirely within the Lampasas Cut Plains physiographic region and Grand Prairies Land Resource Zone. The Lampasas Cut Plains is typically vegetated with oaks such as Texas red oak, live oak, and white shin oak on the rocky Edwards limestone summits of small divides (Diggs et al. 1999). On large divides, areas of deeper soil typically support the westward extension of the Washita Prairie (Hayward et al. 1992). On the chalky thin soiled slopes derived from the underlying Comanche Peak limestone, white shin oak, sumac species, and Ashe juniper may be seen; these dry rocky areas have a distinctly desert-like microclimate (Hayward et al. 1992) and thus support plants with xerophytic adaptations. Below these slopes, on benches in valleys or on the summits of uplands lacking caprock, extensive areas of prairie can be found on the clay soils derived from the Walnut formation where it is exposed (Diggs et al. 1999). The basal Trinity Group sands (Paluxy, Antlers, Twin Mountains-Travis Peak) underlying the Walnut formation developed typical Cross Timbers vegetation such as post oak and blackjack oak (Hill 1901).

The topographic diversity and deeply cut streams found in various parts of the Lampasas Cut Plain provide important microhabitat variation. In particular, the diverse microhabitats allow the northward extension of many species otherwise found primarily on the Edwards Plateau. Some plants that were traditionally considered Edwards Plateau endemics can be found in the

Lampasas Cut Plain. These include big-tooth maple, plateau gerardia (*Agalinis edwardsiana*), wild mercury (*Argythamnia achoroides*), Wright's milk-vetch (*Astragalus wrightii*), plateau false nightshade (*Chamaesaracha edwardsiana*), scarlet clematis (*Clematis texensis*), Lindheimer's silktassel (*Garrya ovata* var. *lindheimeri*), plateau milkvine (*Matelea edwardsensis*), Lindheimer's muhly (*Muhlenbergia lindheimeri*), devil's-shoestring (*Nolina lindheimeriana*), Heller's marbleseed (*Onosmodium helleri*), Lindheimer's rock daisy (*Perityle lindheimeri*), escarpment cherry, turnip-root scurfpea (*Pediomelum cyphocalyx*), plateau spiderwort (*Tradescantia edwardsiana*), Colorado Venus'-looking-glass (*Triodanis coloradoensis*), Lindheimer's crownbeard (*Verbesina lindheimeri*), and twisted-leaf yucca (*Yucca rupicola*).

Data obtained from the Army's Land Condition Trend Analysis (LCTA) Program at Fort Hood indicate that the installation is divided mainly into perennial grassland (65 percent) and woodland (31 percent) community types (Tazik et al. 1992), with relatively little shrubland. Most of the grasslands exhibit a dense or closed vegetative cover (83 percent). As a result of a history of grazing and military activity, the installation's grasslands are dominated by Texas wintergrass (*Stipa leucotricha*) (29 percent) and prairie dropseed (*Sporobolus heterolepis*) (18 percent), with little bluestem (*Schizachyrium scoparium*) grasslands comprising only nine percent of the grassland area (Tazik et al. 1993). Broadleaf woodlands comprise about 39 percent of LCTA woodland sites and typically are dominated by oaks. Coniferous and mixed woodlands comprise 61 percent and are dominated by Ashe juniper or a mixture of juniper and various oaks.

Elevation ranges from 180 m to 375 m (590 to 1,230 ft) above sea level with 90 percent of the area below 260 meters (853 ft). Higher elevations occur on the western portions of Fort Hood and the lowest at the Belton Lake shoreline adjoining the installation on the east. Surface water drains mostly in an easterly direction. Most slopes are in the two to five percent range. Lesser slopes occur along flood plains, while slopes in excess of 45 percent occur as bluffs along flood plains and as side slopes of mesa-hills.

## **B. Status of the species within the action area**

### **Black-capped Vireo**

Monitoring and research activities for BCVI on Fort Hood were initiated in 1987 and continue to the present. Research and conservation efforts include an inventory and monitoring program, remote camera studies of nest depredation and assessment of training activities in habitat, a habitat restoration program, and a cowbird control program. Currently, intensive study plots are established at four sites on the installation.

Based on an installation-wide survey conducted in 2002 and 2003, the current estimate of suitable BCVI habitat on Fort Hood is 6,967 ha (17,216 ac) (Cimprich 2003, Figure 2). This total habitat area does not include the 4.1 ha (10.0 ac) of habitat occurring on Fort Hood lands that are being transferred to Texas A&M University. Approximately 90 percent of suitable BCVI habitat is estimated to be occupied by BCVIs (Cimprich 2003).

Distribution of habitat and populations on Fort Hood is dependent on historical disturbance patterns that result in the preferred habitat structure. Currently, major concentrations of habitat and populations are found in the Live Fire Areas where fire is the predominant disturbance factor, in the west ranges where a combination of fire and mechanized military training has created habitat, and in Land Groups 1 and 2 where fire in 1996 and mechanical range clearing in the mid 1980s has created extensive habitat. BCVI habitat on Fort Hood is typically located on steep slopes and mesa tops and is embedded in a landscape matrix of GCWA habitat and open grassland/savannah.

During the 2002-2003 installation-wide survey, 1,847 adult BCVI males were observed (Cimprich 2003). In intensive study areas with known densities, these surveys detected approximately 25 percent of the known population. If this calibration is extrapolated to the entire installation, this would result in a population estimate of 7,388 territorial males; however, the precision of this estimate is unknown and therefore should be considered with caution (Cimprich 2003). An installation goal of habitat carrying capacity to support 1,000 adult BCVI males at maximum densities has been established based on population viability analyses (Hayden et al. 2001). The observed and estimated populations on Fort Hood exceed this goal by a factor of two to seven times.

Demographic data for 2003 (Cimprich 2003) indicated the daily probability of nest survival was lower in the egg-laying stage than during incubation or the nestling stage, and the probability of survival from the beginning of egg-laying to the end of the nestling period was 23 percent. No trend in nest survival over the past seven years was detected, although daily survival in the incubation period was lower in 2003 than in 2002. Despite relatively high nest predation and low nest success, 58 percent of territorial males succeeded in producing  $\geq 1$  fledgling. Successful nests produced a mean of 3.25 fledglings and territorial males produced a mean of 1.60 fledglings over the entire season.

### **Golden-cheeked Warbler**

Monitoring and research activities for the GCWA on Fort Hood were initiated in 1991 and continue to the present. Research and conservation efforts include assessment of population trends, demographic and reproductive monitoring, habitat selection studies, habitat fragmentation and wildfire studies, and population viability analyses. Intensive study plots are currently established at three sites on the installation.

Currently, it is estimated that approximately 21,422 ha (52,935 ac) of suitable GCWA habitat occur on Fort Hood (Hayden et al. 2001) (Figure 2). This total habitat area does not include the 70 ha (173 ac) of habitat occurring on Fort Hood lands that are being transferred to Texas A&M University. GCWA occurrence has been documented in all training areas that have suitable habitat, including the Live Fire Area. An analysis of point count survey data show the abundance of GCWAs on Fort Hood has increased from 1992 to 2003 (Peak 2003). Using GCWA densities from intensively studied areas, the population on Fort Hood is estimated to range from 2,901 to 6,040 singing males. Observed density in 2003 on intensive study plots was 0.21 males/ha, which extrapolated to all available habitats would produce an estimate of 4,514 territorial males (Peak 2003).

Pairing success in 2003 was 82 percent and was similar to other years during 2000-2003. Daily survival probability of nests during 2000-2003 ranged from 0.94 to 0.97 and was not significantly different among years. Nest success (percent of males fledging at least one young) during the 2000-2003 period ranged from 23 to 40 percent.

The goal of Fort Hood for a minimum viable population is to maintain suitable habitat to support 2,000 males at maximum density (Hayden 2001). Current population estimates exceed this goal by a factor of two to six. Analyses by Peak (2003) indicated that productivity and nest success of Fort Hood GCWA populations are adequate to maintain stable population growth, and in some years may exceed requirements.

#### **IV. Effects of the Action**

The direct and indirect effects of the proposed action involve all activities related to the operation and maintenance of a military installation and other non-military related activities including research and management of federally listed species. The proposed action is described as Ongoing Activities and ESMP revisions, which overlap in scope and cannot be easily separated for an effects analysis without needless redundancy. This section categorizes the potential effects of the proposed action for convenience and references other discussions of effects where necessary to avoid repetition.

##### **A. Ongoing Activities**

Direct and indirect effects to the BCVI and GCWA as a result of military and other activities at Fort Hood are anticipated as these activities occur within and adjacent to endangered species habitat in the action area. These anticipated effects include habitat loss, disruption of breeding behavior such that productivity is affected, and loss of nests and/or young. Potential effects related to human disturbance on avian populations have been reviewed and reported in several studies (e.g., Wilcove 1988, Riffell et al. 1996, Gutzwiller and Hayden 1997, Gutzwiller et al. 1998). Habitat loss due to ongoing activities is largely a result of wildfire within the Live Fire Area. Wildfire may also impact endangered species habitat outside of the Live Fire Area, as in the 1996 fire that burned approximately 2,313 ha (5,715 ac) of GCWA habitat and 415 ha (1,025 ac) of BCVI habitat. The effects of Live Fire Training on endangered species are discussed further under “ESMP Revisions” in this section. Other effects of Ongoing Activities are discussed below.

##### **Black-capped Vireo**

Maneuver training activities are anticipated to affect the BCVI where its habitat is distributed in the west ranges and Land Groups 1 and 2. Military training would be infrequent in BCVI habitat that occurs on steep slopes due to limited access. However, BCVI habitat located on flat areas is accessible to vehicles and personnel and provides a degree of tactical cover that is desirable in training scenarios. BCVI nests are susceptible to direct destruction due to their proximity to the ground and shrub substrate. Since BCVIs use relatively ephemeral, patchily distributed habitats, they are likely adapted to a relatively high level of habitat fragmentation.

Off-road vehicle use and military bivouacs (e.g., tactical operations centers) have been observed in some BCVI habitats since access restrictions were lifted in some areas as a result of implementation of the installation ESMP in 2000. However, observed direct and indirect effects on BCVI in these habitats have been minimal in sites that are intensively monitored. In the last two years, five incidents were reported where military personnel were in close proximity to active nests and were requested to move. In one of these cases, military personnel had put sleeping cots to dry on top of a shrub with an active nest. These personnel were made aware of the nest presence and removed their equipment from the area. This nest remained active subsequent to this event. In another case, it is believed vehicle and personnel in the vicinity of an active nest led to its abandonment. In this case, the banded adult male associated with this nest was not observed again in the area. Another nest was lost in the building stage when a wheeled military vehicle apparently backed over the nest bush. The adult pair subsequently successfully re-nested in the same area. These two documented nest losses in the last two years are out of 402 monitored BCVI nests during this period. Habitat disturbance due to off-road vehicle activity in habitats in the form of crushed or damaged shrubs has been observed. This damage is typically localized with limited alteration of the overall habitat matrix.

Several factors of BCVI biology and habitat preference ameliorate potential effects of disturbance from military activity in habitats. Preliminary physiological and behavioral data collected by T. Hayden on Fort Hood suggests BCVIs may be relatively tolerant of human presence. In 2001 and 2002, physiological stress was assessed in white-eyed vireo (*Vireo griseus*) populations in core BCVI habitat and in unprotected habitat. White-eyed vireos are a closely related con-generic to BCVIs, have similar nesting characteristics, and are locally sympatric with BCVI territories. Measures of corticosterone, the indicator stress hormone in birds, was not significantly different between individuals sampled in protected versus unprotected habitats in 2001 and 2002, suggesting that this species is not chronically stressed in unprotected habitats above levels observed in protected habitats (Hayden, unpublished).

Training activity at any particular site is relatively infrequent and typically of short duration. Observed training patterns at Fort Hood are similar to those studied at Fort Stewart, Georgia, where a relative few sites received the majority of training activity and the majority of this activity was road/trail transit by wheeled vehicles (Hayden et al. 2002). It is expected that BCVIs at any specific locality would have infrequent exposure to military activity of limited duration. A limited number of sites on Fort Hood are known to have a higher probability of military activity relative to the installation as a whole.

Harassment of breeding BCVIs from disturbance due to training activity is most likely to occur from fixed activities within habitat. Fixed activities include establishment of artillery firing points, tactical operation centers, or other field support facilities. Tactical doctrine dictates that artillery units should limit their exposure at any one location. In most cases these units would perform their mission function at the site and depart the location within a few hours to generally no more than 48 hours. Tactical operation centers and field support facilities operate in conjunction with field training exercises that typically run for no more than a two week period. Duration of these field facilities at any one site is typically limited to a few days at most.

BCVIs have a high incidence of double and even triple brooding and repeated re-nest attempts after nest failure. Adult males have been documented to initiate as many as seven nesting attempts during a season at Fort Hood. Impacts to nests and disruption of breeding behavior may affect BCVI productivity depending on the timing of impacts within the breeding season. For example, females that may have been capable of double brooding may only successfully brood once if an impact to the first nesting attempt occurs at a point in the season so as to not allow for two subsequent broods. Alternatively, the loss of a nest or nesting attempt early in the season may not result in an overall loss of productivity due to the species ability to re-nest if necessary.

It should also be noted that extensive areas of habitat at Fort Hood are apparently maintained due to mechanical disturbance by training activity. Approximately 8.1 percent (567 ha [1,401 ac]) of BCVI habitat at Fort Hood is attributed to and maintained by mechanical disturbance from training activity. In the West Ranges, where currently there are no training restrictions, habitats maintained by mechanical disturbance comprise approximately 16.4 percent of BCVI habitat. Due to the earlier successional character of BCVI habitat at Fort Hood, regeneration after physical disturbance is quite rapid. In most cases, only excessive erosion would potentially preclude regeneration after disturbance. BCVI habitats on Fort Hood that are most likely to be disturbed are predominantly flat with limited erosion potential.

### **Golden-cheeked Warbler**

Studies of non-military activities have documented potential effects of human-related activities on the GCWA. Several studies have documented adverse impacts on GCWAs due to urbanization attributed to increased habitat fragmentation, edge, and avian predators (e.g., Sexton 1991, Coldren 1998, Fink 1996, Arnold et al. 1996, Engels 1995). These studies indicate that GCWAs select against habitat edge and reproductive success is reduced in proximity to edges. Studies at Fort Hood in 1995-96 indicated that mating success was lower in more fragmented habitats on the installation (Maas 1998).

GCWA habitat may be directly impacted by off-road vehicle traffic through the destruction or damage of trees. These impacts are likely small in size (limited to individual trees) and localized for the following reasons. Off-road vehicle traffic is largely precluded in GCWA habitat either by topography (steep slopes) and/or density of the associated vegetation. Wheeled vehicles would be unable to traverse through most GCWA habitat. Tracked vehicle transit through habitat is uncommon due to potential damage to the vehicles. Also, transit through vegetation that leaves obvious tracks does not conform to tactical doctrine, which dictates that such activity would increase detection by opposing forces and is therefore inadvisable. No loss of habitat or direct damage to nests due to military activity has been observed in either designated Core or non-core GCWA habitats since monitoring was initiated in 1991.

Fixed activities associated with field training exercises are also uncommon in GCWA habitat due to topography and vegetation density. Examples of fixed activities include artillery firing points, tactical operations centers, communications centers and field medical units. Facilities associated with these activities include personnel, vehicles and trailers, tent facilities, and electrical generator use. The area occupied by these activities is typically < 10 ha (25 ac). GCWA habitat

is not suitable for these field training facilities which require some degree of open space that is not characteristic of the species' habitat.

### **Controlled/Prescribed Burning**

The prescribed burning program at Fort Hood would help reduce fuel loads in proximity to endangered species habitat. This will have the effect of reducing the potential for uncontrolled wildfire in endangered species habitats. Fire would also be used to remove encroaching juniper from BCVI habitat within military training areas. The overall long term effects of prescribed fire would be beneficial to the BCVI and GCWA. Adverse effects, if any, would occur as loss of habitat and likely be short term.

### **Juniper Cutting**

Juniper cutting is currently not conducted in GCWA habitats and would not be conducted under the proposed action. Juniper cutting to control encroachment in old fields would not affect endangered species populations on Fort Hood. Selective removal of second-growth juniper from BCVI habitat with a tree shear is conducted primarily in the western maneuver area, where mechanical effects of military training, rather than fire, is the primary disturbance mechanism. This technique for habitat management, particularly when coupled with a cool season prescribed burn under mild conditions, is useful for habitat enhancement in areas where a stand replacement fire is not appropriate, and will continue to be used as a tool. This selective removal of juniper conducted outside of the breeding season is anticipated to have an overall beneficial effect to the BCVI. Short term effects to habitat would be insignificant.

### **Grazing**

Currently, negotiations for a new cattle grazing lease at Fort Hood have not been finalized. The new lease agreement would be consistent with the grazing SEA and the "Points of Agreement Regarding Methodology for Calculating Animal Units for Grazing at Fort Hood, Texas" dated February 22, 2005 (grazing agreement).

Cattle may directly affect BCVI habitat by browsing on preferred nesting shrubs, but these effects are anticipated to be insignificant, and would only be considered where lack of management allowed overgrazing in BCVI habitat (USFWS 1991, Campbell 1995). The majority of potential effects related to grazing are indirect, involving the relationship of grazing activity and the presence of the brown-headed cowbird (Summers and Norman 2004). Studies at Fort Hood have demonstrated an association of brown-headed cowbird feeding sites with areas of cattle grazing (Kolozsar and Horne 2000). Parasitism by brown-headed cowbirds has been shown to significantly reduce nest success and productivity of BCVIs on Fort Hood (Hayden et al. 2000). However, cowbird control efforts at Fort Hood have significantly reduced the effects of cowbird parasitism that might be associated with cattle grazing at Fort Hood (see Cowbird Control Program below).

Changes in the stocking rate would be based upon current forage inventories, the grazing SEA, and the grazing agreement, which provide adaptive management practices conducive to

endangered species habitat management. The indirect effect of cowbird parasitism, while influenced by the grazing program, is greatly minimized through the cowbird control program. The objective of the cowbird control program is to maintain an annual parasitism rate for the BCVI below 10 percent (averaged over five-year periods) regardless of the cattle stocking rate. The grazing program is not expected to result in take of endangered species provided the allowed stocking rate is based upon current forage inventories and the cowbird control program maintains the parasitism goal.

### **Cowbird Control Program**

The cowbird control program is likely the single most important factor in the observed increases in BCVI and GCWA populations at Fort Hood. Data from Fort Hood shows that without cowbird control, incidence of parasitism of BCVI nests was 90-100% (Tazik et al. 1992). The cowbird control program has reduced the incidence of cowbird parasitism installation-wide, averaging less than 10 percent annually (Hayden et al. 2000, Cimprich 2003). The incidence of cowbird parasitism has a strong negative correlation with BCVI reproductive success (Hayden et al. 2000). Although this relationship is less definitive from the available data for GCWAs, this species is a host to brown-headed cowbirds and likely benefits from reduced cowbird parasitism. The cowbird control program has a significant beneficial effect for both BCVIs and GCWAs at Fort Hood.

### **Recreation**

The potential effects of recreation programs at Fort Hood to the BCVI and GCWA are expected to be insignificant. Fishing activities generally are not conducted in endangered species habitats. Effects of hunting generally would be limited to potential harassment where the hunting season overlaps the endangered species breeding season. Turkey and other bird hunting is often conducted in savannah or riparian habitats not typically occupied by endangered species. Deer hunting is conducted during the non-breeding season of endangered species populations and helps control the potential for over-browsing of endangered species habitat.

Mountain biking is restricted to the Belton Lake Outdoor Recreation Area (BLORA), which contains occupied habitat for the GCWA. Studies by A. Graber on Fort Hood and the Austin area in 2002 and 2003 indicated that GCWAs in habitat areas with recreational trail bike riding had lower reproductive success and larger home ranges (Graber, unpublished data). However, recent studies of GCWA populations at BLORA did not show mountain bike activity to have an adverse impact on the species (Pekins 2002).

### **Population Monitoring and Research Programs**

Monitoring and research programs on Fort Hood are designed to support an adaptive management approach for endangered species populations at Fort Hood. These activities will be modified as necessary to determine response of endangered species populations to actions implemented under the proposed ESMP revision. These data will allow installation natural resource managers to proactively respond to any observed changes in habitats or populations.

## B. ESMP Revision

### 1) Fort Hood Fire Management and Protection Policies

Under the proposed action, fires within the Live Fire Areas would be allowed to “let burn” under fire conditions Green and Amber. Historically, a “let-burn” fire management policy was in effect for the 50-years prior to listing the GCWA as endangered in 1990. During this period, ranges within the Live Fire Areas were subject to the full spectrum of weapons use that was essentially similar to present use including firing of direct and indirect artillery, incendiary devices, small arms, crew-served weapons, and aerial rocketry and munitions. With the exception of habitats burned during the 1996 wildfire, the current mosaic of BCVI and GCWA habitat reflects results of the pre-1990 fire regime. The pre-1990 fire regime resulted in conversion or maintenance of habitat to grassland or to shrub land habitats occupied by BCVIs. GCWA habitat within the Live Fire Areas typically persisted in areas within buffer zones between firing zones and were protected by topography or buffered by BCVI habitat with low fuel loads.

Installation surveys during the 1987-90 period indicated 50 percent of the known BCVI population on Fort Hood occurred within the Live Fire Areas. The lack of heavy mechanized training and limited personnel access within the Live Fire Areas provides essentially undisturbed habitats for GCWAs and BCVIs.

Available data for 1992 through 2003 (excluding the 1996 wildfires) indicates a loss of GCWA and BCVI habitat for all of Fort Hood under the current fire management policy (Table 3). During these years, 0.1 percent (0.2 ha [0.5 ac]) of all GCWA habitat burned occurred during the peak nest months April-June. Of the total BCVI habitat burned, 23 percent (28 ha [69 ac]) burned during the months April through June. The largest one-year loss of GCWA habitat was 65 ha (161 ac) in 1992. The largest one-year loss of BCVI habitat was 36 ha (89 ac) in 2003. Fires in the Live Fire Areas comprised > 80% of the fire totals shown in Table 3.

| Species     | Year |    |    |    |    |    |    |    |    |    |    |      |
|-------------|------|----|----|----|----|----|----|----|----|----|----|------|
|             | 92   | 93 | 94 | 95 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | Avg. |
| <b>GCWA</b> | 65   | 14 | 6  | 5  | 4  | 1  | 0  | 15 | 2  | 6  | 51 | 15   |
| <b>BCVI</b> | 9    | 11 | 12 | 14 | 26 | 0  | 0  | 4  | 0  | 4  | 36 | 11   |

Under the proposed action, fire frequency in endangered species habitats and area of habitat burned may increase over levels observed under normal conditions during the 1992-03 period. Most fires would be expected to occur within BCVI habitats in the Live Fire Areas, since these areas historically have been burned due to ordnance use and are typically the habitat type adjacent to target areas. Burning of these BCVI habitats would result in unsuitability for occupancy for a period of 1-5 years. It is expected that the overall habitat mosaic resulting from this policy would be similar to conditions resulting from the pre-1990 period when fires were allowed to burn.

Loss of GCWA habitat may also increase over 1992-2003 levels under the proposed action, but overall fire dynamics are expected to reflect pre-1990 conditions. Most current habitat within the Live Fire Area is located in buffer areas for range fans. GCWA habitat typically is not located within or adjacent to heavily impacted target areas, since these areas are subject to frequent fires. Fires that occur under the proposed let burn policy within GCWA habitat are expected to be relatively low intensity, since the habitat at Fort Hood typically does not carry fire well under conditions of Green and Amber. GCWA habitat that is burned at Fort Hood converts to BCVI habitat in 1-5 years depending on fire intensity and site characteristics. Virtually all GCWA habitat areas that were burned in the 1996 fires have been subsequently occupied by BCVI (Cimprich 2003). Burned GCWA habitat would be expected to become suitable for use by the species only after a minimum of 25-30 years with no subsequent disturbance.

Several factors associated with the proposed fire management policy would minimize potential effects to endangered species. Fort Hood would maintain restrictions on use of ordnance and incendiary devices as the fire danger rating increases (see Description of the Proposed Action). These restrictions reduce the likelihood of military-related fires as fire risk increases due to environmental conditions. Current fire management and suppression requirements would remain in effect under danger rating Red, which would reduce the possibility of uncontrolled wildfires in endangered species habitats. This includes the use of an on-call helicopter as a first-responder for fire suppression during fire condition Red. Additionally, Belton Lake forms a natural barrier that protects the two major portions of the GCWA core habitat from total loss due to a catastrophic wildfire.

The proposed let burn policy is anticipated to maintain the fire dynamics within the Live Fire Areas necessary to maintain high quality BCVI habitat and periodically reduce fuel loads that contribute to uncontrolled wildfires. BCVI habitat that burns may become suitable for use by the species within the subsequent five-year period. GCWA habitat that burns would be expected to regenerate to high quality BCVI habitat and further serve as a low-fuel load buffer for remaining GCWA habitats.

Fort Hood has established installation carrying capacity goals of 2,000 territorial GCWA males and 1,000 territorial BCVI males. Carrying capacity is the amount of habitat necessary to support a population at maximum densities. The established habitat requirement to meet these carrying capacity goals is 8,520 ha (21,053 ac) of suitable habitat for GCWAs and 4,170 ha (10,304 ac) of suitable habitat for BCVIs. These minimum habitat requirements are based on results of population viability analyses (USFWS 1996a, USFWS 1996b, Hayden et al. 2001) and meet or exceed regional recovery goals for these species (USFWS 1991, USFWS 1992). Habitat loss anticipated under the proposed action would not significantly affect viability of GCWA or BCVI populations either in terms of available habitat carrying capacity or total population size at Fort Hood.

Installation population goals are expressed as carrying capacity since the associated habitat measure provides a replicable and observable metric for tracking trends over time. This metric is complemented by ongoing demographic monitoring programs that validate parameter estimates on which carrying capacity estimates are based. As demographic parameter estimates or viability analyses are refined, the amount of habitat necessary to meet the carrying capacity goal

may be modified, but the goal itself would remain unchanged. The current habitat estimates to meet the established carrying capacity goal is likely a conservative estimate; that is, likely biased toward exceeding the actual habitat required to meet the carrying capacity goals.

## **2. Reduce Area Designated as ‘Core’ Habitat**

The purpose of designating habitats as “core habitat” is to identify habitat areas that would be subject to the Fort Hood Training Guidelines (Appendix A). The purpose of the training guidelines is to minimize habitat damage and harassment of BCVI and GCWA populations during the breeding season from land-based military training activities. This proposal would eliminate core habitat designation for all BCVI habitats. Core habitat designation for GCWAs would be reduced from the current 14,879 ha (36,767 ac) to the proposed 3,861 ha (9,541 ac). The GCWA core habitat provides a reserve of habitat that is not subject to threats from urbanization, fragmentation, agricultural use, or disturbance from training activities during the breeding season.

The types of military training activities that are restricted under the current training guidelines are not conducted in the Live Fire Areas. Vehicle maneuver, dismounted training, and temporary field training facilities are all conducted in maneuver ranges external to the Live Fire Areas. Endangered species populations in the Live Fire Areas would not be subject to harassment or habitat damage from these training activities. Therefore, core habitat designation for habitats in the Live Fire Areas are largely superfluous given the nature of training activities within this area and serve no purpose to protect populations and habitats.

Potential effects of removing training restrictions in maneuver areas include increased presence of troops and field training facilities in excess of two hours, and vehicles traveling off-road through habitats. These activities could result in increased harassment of individuals, direct mortality, nest loss, and/or damage to habitat as discussed under the effects of Ongoing Activities. Transient vehicle traffic on roads and trails and dismounted troop activity is not expected to increase in response to the proposed action since these activities occur in habitat whether or not it is designated as core habitat.

The reduction in the amount of core habitat for the GCWA is not anticipated to increase habitat fragmentation or isolation as a result of maneuver training activities. Prior to listing in 1990, GCWA habitat was only significantly affected by range clearing activities, such as the one conducted in Training Areas 2 and 4 in the mid 1980s. Such habitat clearing activities are addressed in the proposed programmatic take for such activities (see below).

The proposed action would also reduce the time period for implementing Level 2 restrictions in core habitat from 1 March to 30 June. The current time period for Level 2 restrictions was established to accommodate the breeding season of both the GCWA and BCVI occurring in designated core habitats. Under this proposed action, no BCVI habitat would be designated as core habitat, and therefore, minimization gained from Level 2 restrictions would only apply to the GCWA core habitat. The GCWA nesting and breeding season occurs from the first week of March through July, although some birds may stay as late as August. The majority of nesting behavior and territorial displays occurs from March through June. Few territorial songs are

heard after mid-July (Pulich 1976). The proposed changes in the Level 2 time period would accommodate the majority of nesting activity within designated core habitat.

### **3) Construction and Range Improvements**

Under the proposed action, a maximum of 325 ha (803 ac) of endangered species habitat may be permanently lost due to facilities construction and range improvements at Fort Hood. This would directly remove BCVI and GCWA habitat at the project sites and, depending on construction configuration, could lead to increased edge habitat and fragmentation. Effects of these construction activities are generally not equivalent to the impacts associated with urbanization. Typically, the constructed facilities (e.g., MOUT facilities) would have only intermittent human presence. Much of the habitat cleared for range improvements is converted to grassland, which would mimic the landscape matrix associated with non-urban habitats. Since the proposed programmatic take covers several potential projects located throughout the installation, the habitat loss from any one project would likely be on the scale of 10's of hectares. Construction conducted during the nesting season could result in loss of nesting attempts and dislocation of breeding adults.

Assuming a 2:1 ratio of GCWA to BCVI habitat loss under the proposed action, the 325 ha (803 ac) of habitat loss represents 1.0 percent and 1.6 percent of currently available habitat for the GCWA and BCVI, respectively. Construction activities may locally increase fragmentation of associated GCWA habitats including reduced patch size and increased ratio of edge to interior habitat, which may locally have adverse effects on productivity.

Improvements and construction of roads and trails for military training activities may enhance access of troops and vehicles to endangered species habitats. An example would be improved access to hilltop habitats that were not previously accessible. Potential effects of military unit use of endangered species habitats are discussed under the effects of Ongoing Activities.

Planning review by installation natural resource managers provides input on facility siting to minimize impacts on endangered bird habitats. This review occurs early in the planning process. The installation management, monitoring, and research activities described under Ongoing Activities would also assist in minimizing risk to population viability as a result of habitat loss from construction activities.

## **V. Cumulative 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 because they require separate consultation pursuant to section 7 of the Act.

At this time, no future state, tribal, local or private actions are known to be planned within the action area. Because the action area encompasses the entire Fort Hood property, any future actions concerning the area would occur at Fort Hood and thus require a separate consultation.

## **VI. Conclusion**

After reviewing the current status of the BCVI and GCWA, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the BCVI and GCWA. No critical habitat has been designated for these species, therefore, none would be affected.

The majority of the proposed action is composed of ongoing military training activities in conjunction with endangered species management, monitoring and research. Historically, military training activities have resulted in incidental take of the BCVI and GCWA, which has been well documented. It is anticipated that incidental take would continue to occur at Fort Hood at slightly elevated levels due to the proposed changes in the ESMP that allow the Army more flexibility for the training mission. Even at this elevated level, the years of monitoring and research conducted at Fort Hood indicate that the long term population viability of the BCVI and GCWA within the action area would be sustained. Most importantly, Fort Hood has committed to continue the management of endangered species at population levels that meet the regional recovery goal for each species.

In formulating this biological opinion, the Service considered the effects of the action to continue indefinitely, since the activities are ongoing so long as Fort Hood continues to operate. In so doing, the accompanying Incidental Take Statement addresses the anticipated incidental take associated with the proposed action over five-year periods as totaled from the annual take determination. The annual 'take' allowance was calculated based on past events and future needs of the military mission, while ensuring that the potential cumulative impact of the allowed take does not exceed a threshold that would be counter to the population management goals. That is, the amount of habitat loss allowed in the Incidental Take Statement could not exceed the ability to maintain the population goals in successive years. This consideration is especially relevant to the anticipated temporary loss of habitat, which largely occurs from wildfire, and eventually regenerates to suitable habitat for endangered species. Based on these factors, the anticipated incidental take is compatible with long term management of the BCVI and GCWA at Fort Hood.

### **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 to 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, the carrying out of 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 to be 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 the Army for the exemption in section 7(o)(2) to apply. The Army has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Army 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 Army must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement. [50 CFR §402.14(i)(3)].

### **Amount or Extent of Take Anticipated**

The Service anticipates that the proposed action would result in the incidental take of BCVIs and GCWAs. Take would be in the form of harm, harassment, wounding, and/or killing. Take, in the form of harm and/or harassment, is difficult to quantify and usually cannot be estimated in terms of numbers of individuals. However, because the area of habitat for both species is known for the action area, the maximum amount of incidental take allowed under this biological opinion is given in terms of habitat area with regard to harm, and nests and/or nesting attempts lost with regard to harassment, wounding and/or killing.

The incidental take exempted in this statement, with the exception of that related to construction and range improvements, is estimated over five-year increments. That is, barring the need for re-initiation, incidental take related to military training and other activities not including construction and range improvements, should not exceed the anticipated levels authorized in this statement within each successive five-year period. Incidental take related to construction and range improvements is authorized over the immediate five-year period following the date this biological opinion is issued.

Based on 11-years of fire data from 1992-2003 (excluding the 1996 catastrophic wildfire), an average of no more than 72 ha (178 ac) of BCVI habitat would be expected to burn annually. Based on the same data set, Fort Hood anticipates that GCWA habitat loss to fire would average 130 ha (321 ac) annually under the let-burn proposal. These estimates represent the upper range of expected fire effects and reflect a “worst” case for habitat loss due to fire under normal environmental, training and fire control procedures as applied under the proposed action.

The estimated incidental take of endangered species due to fire is based on the worst year of habitat loss for each species during the 1992-03 period (excluding 1996) with a multiplier of two to account for the possibility of increased fire frequency and area under the let burn policy. This results in a maximum estimated loss of 650 ha (1606 ac) of GCWA habitat (65 ha/year x 2 x 5 years) over the next and subsequent five-year periods. A maximum loss of 360 ha (890 ac) of BCVI habitat (36 ha/year x 2 x 5 years) is estimated over the next and subsequent five-year periods. These totals comprise 3.0 percent and 5.2 percent of the total habitat currently estimated for GCWAs and BCVIs, respectively. GCWA habitat that regenerates to BCVI habitat after a

burn will partially offset loss of BCVI habitats that burn. Additional harm to the GCWA resulting from vehicle training activities within suitable habitat is estimated to be 10 hectares (25 ac) over the next and subsequent five-year periods.

The seven observed instances of BCVI nest loss or potential nest disturbance represent 1.7 percent of the observed nest attempts in the intensively monitored areas. Based on this percent and using conservative estimates of the total number of BCVIs on Fort Hood, mating success, and incidence of re-nesting, it is anticipated that no more than 30 nests annually or 150 nests over five years would be lost by training activity in proximity to nest locations. Take of GCWA through harassment is less likely, but may occur where vehicles and/or personnel frequent the edge of habitat. This low likelihood is anticipated to be less than one percent of nest attempts in habitats not designated as core. Based on a minimum current population estimate of 2,900 territorial males and observed nesting, one percent of nest attempts would equal approximately 25 nests annually or 125 nests over five years.

The proposed action estimates incidental take of endangered species through permanent habitat loss due to construction and range improvements over the next five years. Based on current estimates, it is anticipated that 217 ha (536 ac) of GCWA and 108 ha (267 ac) of BCVI habitat would occur over the next five years as a result of the proposed construction and range improvements. A summary of incidental take authorized in this statement is given in Table 4.

| <b>Table 4. Summary of potential incidental take of the black-capped vireo (BCVI) and golden-cheeked warbler (GCWA) resulting from proposed action. Take is estimated in terms of habitat impacts (hectares) and nests and/or nesting attempts lost (nests).</b> |                         |                         |
|--|-------------------------|-------------------------|
| <b>Activity</b>  | <b>BCVI</b>             | <b>GCWA</b>             |
| Incidental take anticipated from training activities over the next 5-year period and successive 5-year periods.  | 360 hectares, 150 nests | 660 hectares, 125 nests |
| Incidental take anticipated from construction and range improvements over the next 5-year period.  | 108 hectares            | 217 hectares            |

**Effect of the take**

In the accompanying biological opinion, the Service determined that the level of anticipated incidental take is not likely to result in jeopardy to the BCVI or GCWA.

**Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the GCWA and BCVI:

- 1) Continue to implement monitoring and research programs for the GCWA and BCVI.
- 2) Manage vegetation clearing projects to minimize fire hazard from slash, and avoid impacts to residual stands.
- 3) Emphasize the use of prescribed burning to support protection and maintenance of endangered species habitat, and support ecosystem management principles.
- 4) Evaluate the effects of predation on endangered species productivity, and investigate management options to reduce nest losses.
- 5) Monitor the quality and quantity of available endangered species habitat.
- 6) Incorporate preventative measures to avoid future uncontrolled burns similar to the February 1996 fires.
- 7) Implement training restrictions in GCWA Core Habitat.
- 8) Monitor the distribution and spread of oak wilt, and use appropriate measures to limit effects on endangered species habitat.
- 9) Restrict recreational use in endangered species habitat.

### **Terms and conditions**

In order to be exempt from the prohibitions of section 9 of the Act, the Army must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

- 1) Continue to implement monitoring and research programs for the GCWA and BCVI.
  - a) Document population trends and assess population status of the BCVI and GCWA.
  - b) Evaluate the effects of de-designation of Core Habitat on GCWA and BCVI demography and productivity.
  - c) Evaluate the relationship between habitat quality and GCWA abundance and productivity.
  - d) Evaluate fire-related dispersal patterns of GCWAs.

e) Continue to allow safe access to training and Live-Fire Areas for BCVI and GCWA surveys during the period of March 15 through July 31 to ensure that equivalent data is collected for study areas both in and out of the Live Fire Area. It is important that the integrity of data collected from existing BCVI and GCWA productivity, predation and population trend studies is maintained.

f) Continue to generate color sequences for range-wide color banding of BCVI and GCWA through cooperation with the Service.

g) Investigate the dispersal of GCWAs and BCVIs from Fort Hood to surrounding areas through cooperative studies with other researchers and at Corps of Engineers property at Lake Belton and Stillhouse Hollow Lake.

2) Manage vegetation clearing projects to minimize fire hazard from slash, and avoid impacts to residual stands.

a) During juniper clearing or other brush removal projects, construction of firebreaks, power line right of ways, roads, etc., avoid piling material around or against residual standing trees. Ensure that slash material is pulled away from standing live trees and removed from the site, burned, or mulched in place. Slash disposal methods will be included in the scope of proposed projects.

b) Where possible, mulching slash material on site is preferable to removal or burning, in order to return nutrients to the soil and reduce erosion.

c) As an integral part of project design, maximize the use of preventative measures to minimize soil loss after vegetation removal. Examples include re-seeding with native herbaceous plant seed, deferral of grazing from rehabilitation sites, placement of water bars on slopes, and using waste material in gullies as appropriate.

d) All vegetation clearing projects must include coordination with Natural Resources Management Branch from the planning phase forward in order to minimize or avoid impacts to endangered species and their habitat, and must support overall objectives of the INRMP, of which the ESMP is a part.

e) Develop a habitat regeneration/enhancement plan that is compatible with endangered species management and mission training requirements.

3) Emphasize the use of prescribed burning to support protection and maintenance of endangered species habitat, and support ecosystem management principles.

a) All prescribed burning must be overseen by Natural Resources Management Branch personnel certified and experienced in prescribed burning techniques, and support the overall objectives of the INRMP.

- b) Identify areas suitable for maintenance as BCVI habitat and implement habitat management prescriptions as necessary.
  - c) Use prescribed fire to the maximum extent possible to reduce fuel loads near important areas.
  - d) Use prescribed fire to maintain prairie sites and to inhibit development of pure juniper stands. Fire should be considered as a low-cost, non-invasive means of avoiding future need for destructive large-scale mechanical clearing projects.
- 4) Evaluate the effects of predation on endangered species productivity, and investigate management options to reduce nest losses.
- a) Investigate species-selective methods for control of imported fire ants in endangered species habitat and near important karst features.
  - b) Continue to control feral hog population utilizing aerial support and trapping, and evaluate effectiveness of control methods.
- 5) Monitor the quality and quantity of available endangered species habitat.
- a) Continue use of helicopter over-flights as needed to ensure compliance with training guidelines, monitor effects of training activity in endangered species habitat, and monitor oak wilt centers.
  - b) Evaluate habitat trends based on change detection imagery every five years.
  - c) Maintain adequate natural resource law enforcement presence to effectively monitor land use, and enforce training guidelines and off-road vehicle restrictions.
  - d) Refine mapping efforts to enhance endangered species information management on Fort Hood.
- 6) Incorporate preventative measures to avoid future uncontrolled burns similar to the February 1996 fires.
- a) Increase fire prevention and response efforts by:
    - (i) coordinate with the Fire Department and Natural Resource Management Branch during the decision to approve/disapprove Range Condition Red waivers;
    - (ii) maintain and upgrade fire-fighting capabilities including aerial support, subject to the availability of funds.
  - b) Continue research on the effects of the 1996 burn.

7) Implement training restrictions in GCWA Core Habitat.

a) Implement *Training Guidelines for Use of Endangered Species Habitat* (Appendix A) at two levels. Level 1 applies from July 1 through February 28. Level 2 is more restrictive, and applies from March 1 through June 30.

b) Provide orientation and training for appropriate personnel on the implementation of the guidelines.

8) Monitor the distribution and spread of oak wilt, and use appropriate measures to limit effects on endangered species habitat.

a) Develop and maintain a current map of oak wilt centers, with particular emphasis on training areas where core endangered species habitat occurs.

b) Identify and prioritize oak wilt centers which threaten, or may potentially threaten, core habitat.

c) Investigate treatment and/or isolation methods which might be feasible to limit oak wilt effects.

d) Implement appropriate measures based on priority evaluation.

e) If fungal mats are identified on trees that necessitate removal of that tree during the breeding season, a representative of the Natural Resource Management Branch will be present to ensure that the tree is not being directly utilized by the GCWA as a nesting site. Every effort will be taken to avoid or minimize a direct impact to listed species as a result of management for oak wilt.

f) Investigate the effects of oak wilt on GCWA habitat.

9) Restrict recreational use in endangered species habitat.

Prohibit the use of motorized off-road recreational vehicles in endangered species habitat.

### **Reporting Requirements**

The results of all surveys and studies specified in this biological opinion will be reported to the ARLFO by December 31 of the year the studies are conducted.

### **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 listed species or critical habitat, to

help implement recovery plans, or to develop information. The following recommendations are provided for consideration by the Army:

- 1) Fort Hood contains important karst ecosystems that provide habitat for several cave invertebrates and one species of salamander that appear to be endemic. Considering the status of similar karst invertebrates and salamanders endemic to the Edwards Plateau region, Fort Hood is encouraged to continue monitoring and managing the habitat of these species. This would include the development and implementation of a management plan and providing adequate protection of these ecosystems.
- 2) Fort Hood is encouraged to consider BCVI and GCWA habitat when implementing Compatible Use Buffer activities. This would include extending management and monitoring activities to adjacent lands utilized for buffer purposes when possible.
- 3) Fort Hood is encouraged to continue work on an off-site conservation plan that would support the on-the-ground work of non-governmental organizations dedicated to the conservation of the BCVI and GCWA.

### **Reinitiation Notice**

This concludes formal consultation on the actions outlined in the request. 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 Service appreciates the cooperation extended by the Army staff and participating parties during this consultation. If further assistance or information is required, please contact Mr. Omar Bocanegra or myself at the above address or telephone (817) 277-1100.

Sincerely,



Thomas J. Cloud, Jr.  
Field Supervisor

cc: State Administrator, Ecological Services, Austin, TX  
Regional Director, FWS, Albuquerque, NM (Attn: ARD-ES)

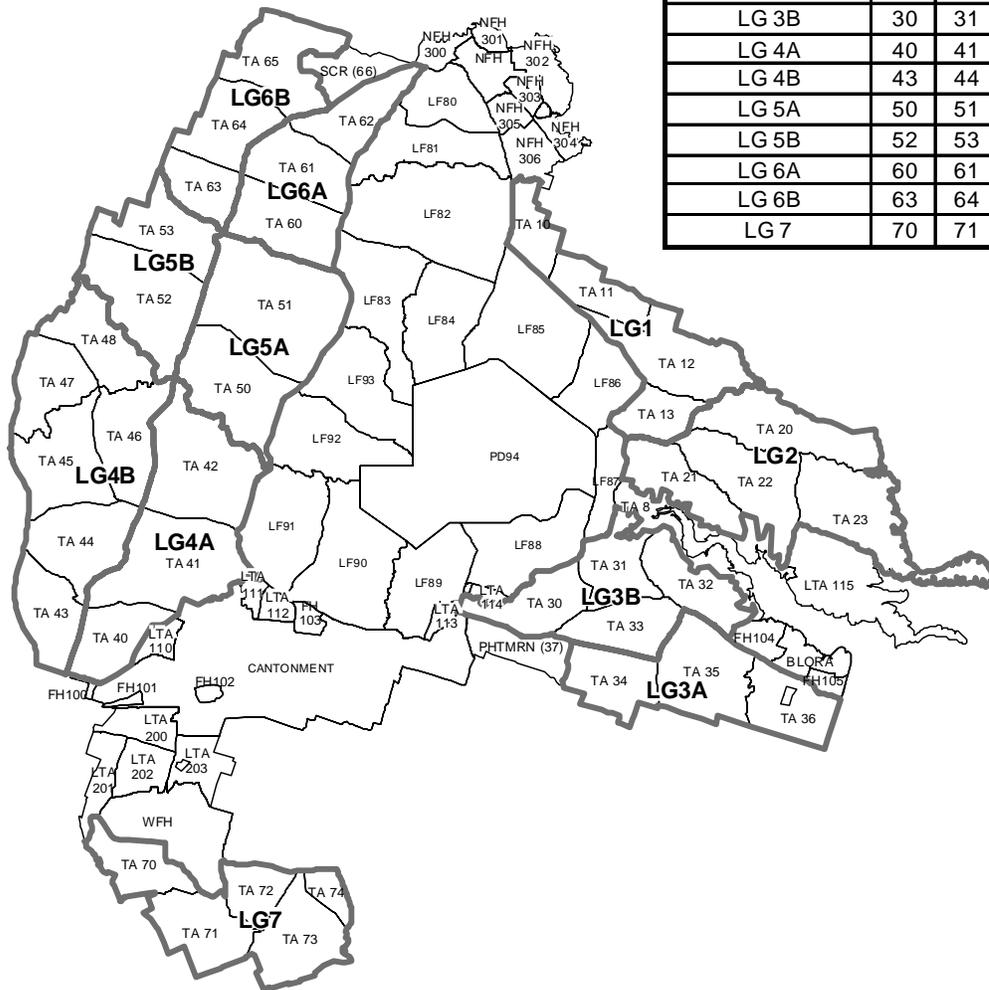
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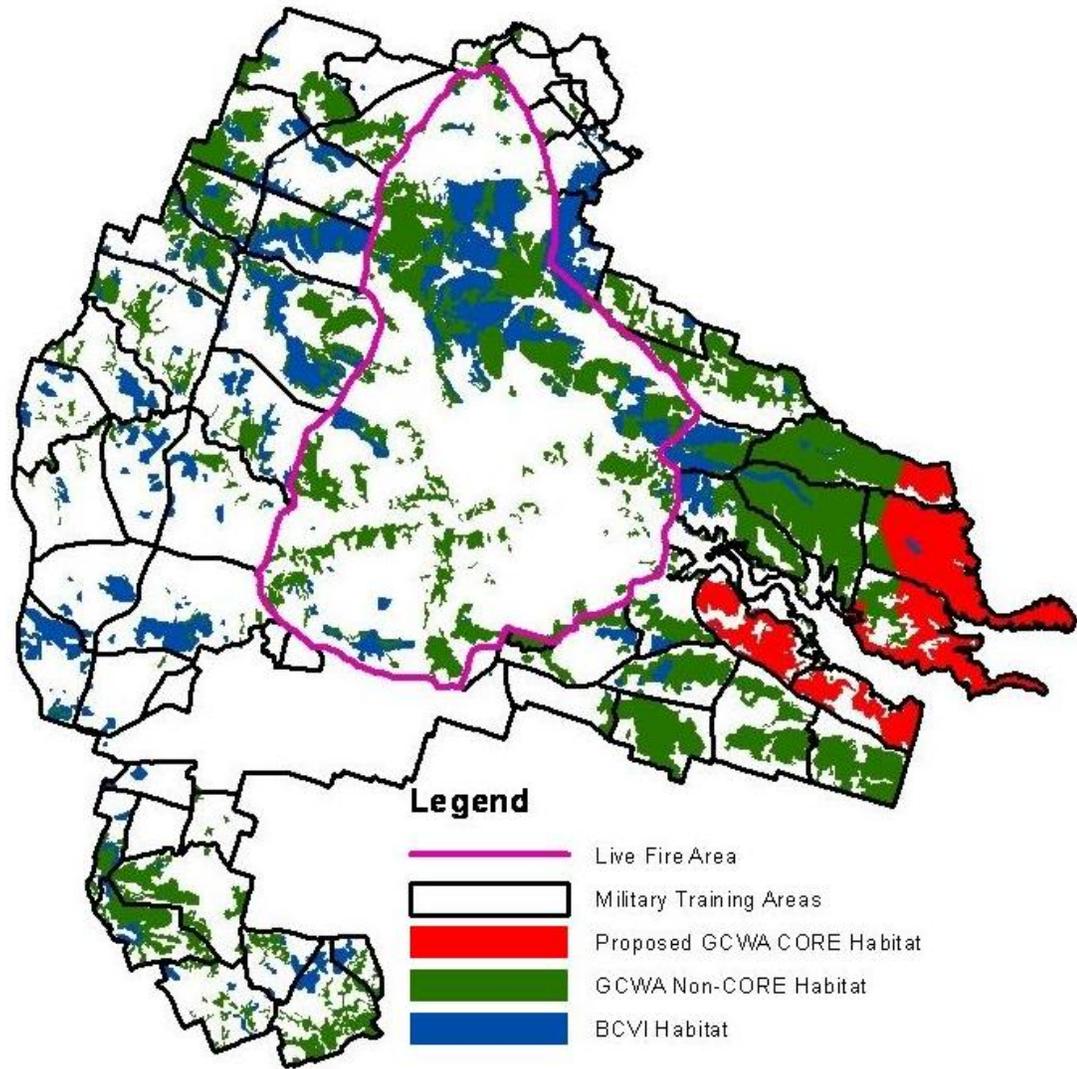
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| LAND GROUP (LG) | TRAINING AREAS (TA) |    |    |    |    |    |
|-----------------|---------------------|----|----|----|----|----|
| LG 1            | 10                  | 11 | 12 | 13 |    |    |
| LG 2            | 20                  | 21 | 22 | 23 |    |    |
| LG 3A           | 34                  | 35 | 36 |    |    |    |
| LG 3B           | 30                  | 31 | 32 | 33 |    |    |
| LG 4A           | 40                  | 41 | 42 |    |    |    |
| LG 4B           | 43                  | 44 | 45 | 46 | 47 | 48 |
| LG 5A           | 50                  | 51 |    |    |    |    |
| LG 5B           | 52                  | 53 |    |    |    |    |
| LG 6A           | 60                  | 61 | 62 |    |    |    |
| LG 6B           | 63                  | 64 | 65 |    |    |    |
| LG 7            | 70                  | 71 | 72 | 73 | 74 |    |



**Figure 1.** Training Area designations for Fort Hood, Texas. PD = permanently duded area. LF = live-fire ranges. WFH = West Fort Hood. BLORA = Belton Lake Outdoor Recreation Area.



**Figure 2.** Current distribution of endangered species habitat and GCWA habitats proposed for designation as “core” on Fort Hood, Texas.

## APPENDIX A

### TRAINING GUIDELINES FOR USE OF ENDANGERED SPECIES HABITAT

*Guidelines are implemented at two levels. Level 1 applies from 1 July through 28 February. Level 2 is more restrictive, and applies from 1 March through 30 June. The hierarchical structure allows greater utilization of habitat during the period when the endangered species are not present, while providing adequate protection during the nesting period. Guidelines should be used in conjunction with a 1:50,000 training area map with current endangered species habitat overlay.*

#### LEVEL 1 RESTRICTIONS (applicable from 1 July through 28 February)

1. Report all fires to Range Control. Do not start fires.
2. Use previously established firing points, fighting positions, and emplacements only. All digging must be cleared by the Directorate of Public Works (DPW) through approval of an excavation permit, form FHT 420-X10.
3. Comply with range rules regarding use of flares, incendiary munitions, etc. Ensure that firefighting equipment and personnel on hand are in compliance with Fire Danger Rating SOP.
4. Park equipment in open areas only. Do not cut brush or trees for camouflage, road blocks, or other purposes.
5. Use existing roads and trails. Do not drive vehicles through or over woody vegetation.
6. Do not tamper with, or release birds from, cowbird traps. Traps are serviced regularly and are an essential component of the endangered species management program.

#### LEVEL 2 RESTRICTIONS (applicable from 1 March through 30 June)

ALL LEVEL 1 RESTRICTIONS, PLUS THE FOLLOWING:

7. Occupation of habitat areas is limited to drive-through on existing trails, or emergency stop only. No bivouac or other long-term posts are permitted within habitat areas. Long-term is defined as exceeding 2 hours in duration.

*NOTE: Due to difficulty in providing adequate detail at 1:50,000 map scale, habitat overlays sometimes obscure open areas within habitat blocks where some limited long-term use is possible. Proposed use of open areas within habitat must be coordinated with and approved by*

*DPW, Natural Resources Management Branch personnel on a case-by-case basis. Arrange for site visit during earliest planning stages (287-2885).*

8. No use of obscurant smokes or other chemical agents in or within 100 meters of habitat.

*Guidelines are intended to minimize actions which cause physical damage to habitat or disturb nesting. Careful planning and use of current habitat maps are necessary to avoid conflict and possible disruption of training activities in the field. If in doubt regarding acceptable locations or activities in or near habitat, contact DPW, Natural Resources Management Branch at 287-2885.*