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JAN 20 2015

Consultation #: O2ETAU00-2014- F-0267

Dear Mr. Jaynes,

This transmits our biological opinion for the proposed Federal Emergency Management Agency (FEMA) funding through their Hazard Mitigation Grant Program (HMGP- DR-1999-0015) of hazardous fuel reduction work by the City of Cedar Park on public lands within Cedar Park including Discovery Wells Cave Preserve, Buttercup Creek Cave Preserve, Rattling Horn Park, Ranch Trails Park, and in city-owned greenbelts. Ranch Trails Park is also known as Ranch at Brushy Creek Park. Hazardous fuel reduction activities include trimming or cutting trees within 25 feet of the property line between city-owned land and private residences, removal of hazardous fuels by clearing brush and combustible materials, and cutting tree branches to heights of up to 8 to 10 feet from ground level. Hazardous fuel reduction would be performed in linear strips along the property lines of approximately 450 homes and other structures for approximately 42,110 linear feet and a total of 24.2 acres (proposed action). The geographic scope of the proposed action includes Discovery Wells Cave Preserve, Buttercup Creek Cave Preserve, Rattling Horn Park, Ranch Trails Park, and city-owned greenbelts within Cedar Park, Williamson County, Texas. FEMA requested formal consultation from the U.S. Fish and Wildlife Service's Austin Ecological Services Field Office (Service), for the hazardous fuel reduction work in a letter dated September 2, 2014, with an attached Biological Assessment, City of Cedar Park, Texas, Hazardous Fuels Reduction Project, Williamson County, Texas dated September, 2014 (BA).

The purpose of the proposed action is to reduce wildfire hazard through the reduction and removal of understory vegetation that has accumulated between private residences and public preserve properties. It is anticipated that the proposed hazardous fuel reduction project may adversely affect the golden-cheeked warbler (*Setophaga (=Dendroica) chrysoparia*) and Tooth Cave ground beetle (*Rhadine persephone*), listed as endangered pursuant to the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 et seq.). This consultation is pursuant to section 7 of the Act.

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Other species listed as threatened or endangered pursuant to the Act, specifically Williamson County karst species (*Batrachoseps texanus* and *Texella reyesi*), have not been detected within the proposed action area. Habitat for listed bird species (*Charadrius melodus*, and *Grus americana*) and two listed species of salamanders (*Eurycea naufragia* and *Eurycea chisholmensis*) does not occur within the action area. Therefore, these species will not be discussed further in this biological opinion. FEMA has determined that the effects of the proposed action are not likely to adversely affect the black-capped vireo (*Vireo atricapilla*) and the Jollyville Plateau salamander (*Eurycea tonkawae*), and the proposed actions are not likely to modify designated critical habitat for the Jollyville Plateau salamander. The Service concurs with the not likely to adversely affect determinations due to avoidance and minimization measures included in the biological assessment and the restricted linear nature of the proposed activity (Please see sections 4.2 and 4.3 in the BA). The Service additionally concurs with the not likely to adversely affect critical habitat determination as the project as proposed will not affect surface and subsurface primary constituent elements for the Jollyville Plateau salamander (Please see section 4.3.1 in the BA).

The findings and recommendations in this consultation are based on: (1) the Biological Assessment, City of Cedar Park, Texas, Hazardous Fuels Reduction Project, Williamson County, Texas dated September, 2014, (2) a site visit attended by the City of Cedar Park, FEMA, and the Service August 7, 2014, (3) discussions with City of Cedar Park and FEMA staff; and, (4) other sources of information available to the Service.

Consultation History

- November 27, 2013* The Service received an e-mail from FEMA requesting early informal consultation on the City of Cedar Park hazardous fuel reduction project.
- January 9, 2014* The Service requested additional information by e-mail from FEMA regarding project description and proximity of the project to occupied cave locations.
- May 30, 2014* The Service received a letter from FEMA transmitting the BA and requesting initiation of formal consultation on the City of Cedar Park hazardous fuel reduction project.
- June 25, 2014* The Service requested additional information from FEMA and a revised BA by e-mail.
- June 26-*
- August 6, 2014* The Service and FEMA continued informal consultation with clarifying information being transmitted by e-mail to inform revisions to the BA.

- August 7, 2014* The Service met and conducted a site visit with FEMA and the City of Cedar Park to discuss avoidance and minimization measures.
- September 2, 2014* The Service received a letter from FEMA transmitting the revised BA and requesting initiation of formal consultation on the City of Cedar Park hazardous fuel reduction project.

BIOLOGICAL OPINION

Proposed Action

For more specific information regarding the objectives of the proposed action, please refer to the BA.

The City of Cedar Park has submitted an application to FEMA through the Texas Division of Emergency Management (TDEM) for a grant under FEMA's HMGP. TDEM is the direct applicant for the grant, and the City of Cedar Park is the subapplicant. The City of Cedar Park proposes to implement hazardous fuels reduction in four city parks and in city-owned greenbelts (parks include Discovery Well Cave Preserve, Buttercup Creek Cave Preserve, Rattling Horn Park, and Ranch Trails Park) to reduce wildfire hazards in residential areas near wooded areas in the parks. The four targeted neighborhood parks represent a potential direct wildfire threat to nearby residences and businesses.

Hazardous fuel reduction activities include trimming or cutting trees within 25 feet of the property line between city-owned land and private residences, removal of hazardous fuels by clearing brush and combustible materials, and cutting tree branches to heights of up to 8 to 10 feet from ground level. All Ashe juniper (*Juniperus ashei*) trees and selected hardwood trees less than 8 inches in diameter (depending on condition and structure) would be removed within the 25 foot project area. Hazardous fuel reduction would be performed in linear strips along the property lines of approximately 450 homes and other structures for approximately 42,110 linear feet and a total of 24.2 acres (Please see Figures 1.2 and 1.3 in the BA).

Stumps of trees that are removed would remain in place and would be cut to ground level to avoid ground disturbance. Cut, trimmed, dead, and downed vegetation would be mulched, and mulched material would be left on trails within the parks, preserves, and greenbelt areas to a depth of no more than 3 inches. Mulch would not be placed on the ground within 345 feet of occupied cave openings because it could hinder the regrowth of vegetation near cave openings. Any material exceeding the 3 inch depth on the work site would be distributed as needed via the Parks Department to other nature trails within the City of Cedar Park.

During project implementation, the equipment used would include chainsaws, chippers, and trucks and trailers. The City of Cedar Park would take steps to minimize soil disturbance such as

the use of rubber tracks on all machinery in the project area during vegetation removal. No herbicides would be used during any phase of the proposed action.

Per FEMA grant requirements, the City must maintain the areas where hazardous fuels reduction activities have been completed to achieve the proposed wildfire hazard mitigation. Maintenance activities will include mowing treated areas with a heavy brush cutter and red-imported fire ant (RIFA) eradication efforts. Any maintenance mowing conducted in treated areas must be done at a height of 6 inches or higher. Ongoing maintenance would not include the use of herbicides.

Site preparation and monitoring

The City of Cedar Park will host a preconstruction coordination meeting with the work crews and/or the contractor and their staff to go over the project implementation plan. As part of the site preparation for the proposed project FEMA and the City of Cedar Park will clearly identify all buffer zones relevant for project implementation with colored flags or tape prior to the beginning work. Each zone will be marked with a different colored flag or tape and the delineation of these zones will be consistent throughout the scope of the project. The buffer zones that will be marked include:

- 100 feet from cave openings (no mechanical trimming or cutting may occur),
- 345 feet from cave openings (no mulch can be placed, hot water treatments for Red Imported Fire Ants (RIFA) must be conducted), and
- 500 feet from cave openings (no refueling, equipment staging, or storage of fuels may occur in this area).

The flags or tape marking the buffer zones will be promptly removed when work is complete. Additionally, the City of Cedar Park will provide a full time monitor that will oversee implementation of the project and ensure that all avoidance and minimization measures are completed and adhered to.

Project timing

FEMA and the City of Cedar Park would conduct hazardous fuels reduction work only outside of the breeding season for golden-cheeked warbler. Work would be allowed from September 1 through February 28. Work would not be conducted from March 1 through August 31. The implementation of the proposed project is scheduled to occur over a period of 6 to 8 weeks.

Proposed Conservation Measures

FEMA and the City of Cedar Park have proposed the following conservation measures to minimize adverse effects to Tooth Cave ground beetle and golden-cheeked warbler.

Conservation measures applicable to karst species would be implemented near occupied cave openings, including Nelson Ranch Cave, Convolutated Cave, Grimace Cave, Pig Snout Cave, Harvestman Cave, Whitestone Pit, Stonewell Cave No. 1 and 2 (2 caves), Buttercup Blowhole,

Cedar Elm Cave, Good Friday Cave, Salamander Squeeze, TWAS Cave, Animal Canyon Cave, May BA Cave, and Three Oaks Cave. Implementation of these measures is a condition of the FEMA grant and a requirement of federal funding.

- The City of Cedar Park will hand cut vegetation within 100 feet of the openings of occupied caves (please see Figure 1.4 in the BA and list of caves above) and remove the vegetation with rubber-tracked equipment to minimize ground disturbance. The 100 foot buffer area will be well marked for work crews by flagging/taping and these materials will be promptly removed once work is complete.
- Deposition or accumulation of soil, trash, ashes, refuse, waste, bio-solids, or any other materials at the project site as a result of the proposed action is prohibited. Vegetative debris must be removed from the project site or mulched and spread on-site. Mulch would be placed on existing trails with appropriate measures (such as adequate setbacks or a silt fence) to prevent mulch from washing into cave openings. Mulch cannot be placed within 345 feet from occupied cave openings.
- Equipment staging, refueling, and storage of gasoline must occur more than 500 feet from the entrance of any occupied cave.
- To reduce the re-colonization of RIFA, the City of Cedar Park will re-seed treated areas within 345 feet of the openings of occupied caves (please see Figure 1.4 in the BA and list of caves above) with a native seed mix.
- The City of Cedar Park must implement boiling water treatments on RIFA colonies following the first rain of the first spring after project implementation. Boiling water treatments are required within treated areas within 345 feet of the openings of occupied (please see Figure 1.4 in the BA and list of caves above). Boiling water treatments are most effective during early to mid-morning when the queen(s) and larvae are likely to be near the top of the mound. Mounds should not be disturbed before treatment as this causes the ants to move the queen(s) and larvae to deeper locations within the mound or to a remote location.
- As part of the maintenance program, the City of Cedar Park will conduct RIFA eradication efforts twice annually, during the spring and fall within treated areas that are within 345 feet of the openings of occupied caves. This should include a regimen of two or more treatments per month. If some time has passed since the initial RIFA invasion, the control regimens can be decreased to one or fewer times per month, provided that RIFA mounds have decreased. Once RIFA levels are below the thresholds outlined in "Karst Preserve Management and Monitoring Recommendations," USFWS (2014c), RIFA control can occur twice annually. Treated areas mowed during maintenance efforts must be mowed to a height of 6 inches or higher.

- The City of Cedar Park must seal any wounds on oaks that are the result of pruning and seal any oak stumps that are created as a result of the proposed action in order to prevent transmission of the oak wilt fungus.
- The City of Cedar Park must ensure that best management practices (BMPs) are implemented to prevent erosion and sedimentation to nearby or adjacent waters including Buttercup Creek. This includes equipment storage and staging practices to minimize erosion and sedimentation.

Description of the Action Area

Area Affected

The action area is defined as Discovery Wells Cave Preserve, Buttercup Creek Cave Preserve, Rattling Horn Park, Ranch Trails Park, and in city-owned greenbelts (please see Figure 1.2 in the BA).

Status of the species

Tooth Cave ground beetle

For more detailed information please see the Service's recovery plan for the Tooth Cave ground beetle.

Species Description and Life History

The Tooth Cave ground beetle (*Rhadine persephone*) was listed as federally endangered on September 16, 1988 (53 FR 36029) due to increased urban development, pollution, vandalism, and red imported fire ants (*Solenopsis invicta*). The Tooth Cave ground beetle is a reddish-brown, moderately robust and convex beetle that possesses rudimentary eyes and reaches a total length of 7-8 mm at maturity. Teneral (young adult beetles that have recently emerged) of all *Rhadine* species are pale yellow but soon darken to reddish brown. This species is the largest and most active of the Austin-area endangered karst invertebrates. The type specimen was collected from Tooth Cave in May, 1965 by R.W. Mitchell, T.C. Barr, Jr., and W. M. Andrews. The type specimen was described as follows: head half as wide as long, neck approximately 57 to 59% of greatest head width, pronotum 0.07 inches long and 0.04 inches wide, elytra 0.17 inches long by 0.09 inches wide, and antenna 0.27 inches long. The *Rhadine persephone* is distinguishable from the closely related species *Rhadine subterranea* by its more robust build and shorter pronotum. These beetles are usually found under rocks but can be seen walking on damp rocks and silt within caves. Although the feeding behavior is relatively unknown, *R. subterranea* is thought to be a predatory generalist that feeds on a wide range of insect species.

There is little specific information on the life history and specific habitat requirements of the Tooth Cave ground beetle. This is largely because troglobites (animals that complete their life cycle underground and exhibit adaptation to the subsurface environment such as absence of eyes) are subterranean, inconspicuous, and difficult to study (Mitchell 1971; Chandler 1992). However, we know that the Tooth Cave ground beetle is an obligate cave dweller whose

continued existence depends on the ecological stability of the karst environments in which it is found. Temperature and humidity are relatively constant within undisturbed karst environments and troglobites are dependent upon moisture and nutrient inputs from the surface.

Historic and Current Distribution

The Tooth Cave ground beetle is known to have a limited distribution within central Texas and includes only the Cedar Park and Jollyville Karst Fauna Regions (KFRs) as delineated by Veni (1992). At the time the recovery plan was written, the Tooth Cave ground beetle was known from 17 caves in the Cedar Park KFR and ten caves in the Jollyville Plateau KFR. Additional discoveries have increased the number of caves known to harbor the species. The five year review for this species (USFWS 2008) indicated there are 54 known Tooth Cave ground beetle locations (three of which have been destroyed) in Travis and Williamson counties, Texas. These locations are divided between the two KFRs: Jollyville Plateau (17 caves) and Cedar Park (37 caves).

Reasons for Decline and Threats to Survival

The primary threat to the Tooth Cave ground beetle is the loss of habitat due to encroaching urban development. The species occurs in an area of central Texas that is undergoing continued urbanization. Direct loss of subterranean habitat may occur when caves and voids are filled and/or collapsed as a result of construction, development, ranching, and quarry and mine-related activities. Alterations of topography, vegetation and drainage patterns from urbanization can ultimately lead to changes in the moisture regime, nutrient loading, and increases in sedimentation into the karst ecosystems. Karst environments are also highly susceptible to groundwater contamination. Sources of this contamination include urban runoff, agricultural pesticide use, transportation and pipeline spills and landfills.

Range-wide Survival and Recovery Needs

The recovery plan for this species (USFWS 1994) calls for the protection of at least three Karst Fauna Areas (KFAs) within each KFR in order to downlist the species from endangered to threatened. According to the five year review for this species (USFWS 2008) no existing locations currently meet the definition for a KFA. However, within each KFR at least three locations exist that with additional information, protection, or management could meet the definition of a KFA. Potential KFA sites within the Jollyville Plateau KFR include the West Park, Stovepipe, Cuevas, and Four Points tracts, and within the Cedar Park KFR potential KFA sites include the Lime Creek and Discovery Well sites. Multiple caves confirmed to contain the Tooth Cave ground beetle may be found within one site.

Golden-cheeked warbler

Species Description and Life History

The golden-cheeked warbler was emergency listed as endangered on May 4, 1990 (55 FR 18844). The final rule listing the species was published on December 27, 1990 (55 FR 53160). No critical habitat is designated for this species.

The golden-cheeked warbler is a small, insectivorous songbird, 4.5 to 5 inches long with a wingspan of approximately 8 inches (Pulich 1965 and 1976, Oberholser 1974). Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the central Texas Hill Country west and north of the Balcones Fault (Pulich 1976). Golden-cheeked warblers require the shredding bark produced by mature Ashe junipers for nest material. Typical deciduous woody species include Texas oak (*Quercus buckleyi*), Lacey oak (*Q. glaucoides*), live oak (*Q. fusiformis*), Texas ash (*Frazinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), and pecan (*Carya illinoensis*) (Pulich 1976, Ladd 1985, Wahl et al. 1990). Breeding and nesting golden-cheeked warblers feed primarily on insects, spiders, and other arthropods found in Ashe junipers and associated deciduous tree species (Pulich 1976).

Male golden-cheeked warblers arrive in central Texas around March 1st and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. Female golden-cheeked warblers arrive a few days later, but are more difficult to detect in the dense woodland habitat (Pulich 1976). Three to five eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June (Pulich 1976). If there is a second nesting attempt, it is typically in mid-May with nestlings fledging in late June to early July (Pulich 1976). By late July, golden-cheeked warblers begin their migration south (Chapman 1907, Simmons 1924). Golden-cheeked warblers winter in the highland pine-oak woodlands of southern Mexico and northern Central America (Kroll 1980).

Historic and Current Distribution

The golden-cheeked warbler's entire breeding range occurs on the Edwards Plateau and Lampasas Cut Plain of central Texas. Golden-cheeked warblers have been confirmed in 39 counties: Bandera, Bell, Bexar, Blanco, Bosque, Burnet, Comal, Coryell, Dallas, Eastland, Edwards, Erath, Gillespie, Hamilton, Hays, Hill, Hood, Jack, Johnson, Kendall, Kerr, Kimble, Kinney, Lampasas, Llano, Mason, McLennan, Medina, Menard, Palo Pinto, Real, San Saba, Somervell, Stephens, Tom Green, Travis, Uvalde, Williamson, and Young. However, many of the counties where golden-cheeked warblers are known to occur, now or in the past, have only small amounts of suitable habitat (Pulich 1976, Service 1996, Lasley et al. 1997). Estimates of the amount of suitable warbler breeding habitat range from approximately 321,000 to 1.7 million hectares (247,000- 4.2 million acres), and much of this habitat occurs on private lands (Groce et al. 2010). As a result, the population status for the golden-cheeked warbler on private lands remains undocumented throughout major portions of the breeding range.

Reasons for Decline and Threats to Survival

Before 1990, the primary reason for golden-cheeked warbler habitat loss was juniper clearing to improve conditions for livestock grazing. Since then, habitat loss has occurred as suburban developments spread into prime golden-cheeked warbler habitat. Groce et al. (2010) summarized the rates of expected human population growth within the range of the golden-cheeked warbler and found by 2030 the growth rate ranges from 17 percent around the Dallas-Fort Worth area to over 164 percent around San Antonio. As the human population continues to increase, so do associated roads, single and multi-family residences, and infrastructure, resulting in continued habitat destruction, fragmentation, and increased edge effects.

Fragmentation is the reduction of large blocks of a species' habitat into smaller patches. While golden-cheeked warblers have been found to be reproductively successful in small patches of habitat (<50 acres), there is an increased likelihood of occupancy and abundance as patch size increases (Coldren 1998, DeBoer and Diamond 2006, Butcher et al. 2010). Increases in pairing and territory success are also correlated with increasing patch size (Arnold et al. 1996, Coldren 1998, Butcher et al. 2010). In addition, while some studies have suggested that small patches that occur close to larger patches are likely to be occupied by golden-cheeked warblers, the long-term survival and recovery of the golden-cheeked warbler is dependent on maintaining the larger patches (Coldren 1998, Peterson 2001, TNC 2002).

As a species' habitat fragmentation increases it creates edges where two or more different vegetation types meet. For the golden-cheeked warbler, edge is where woodland becomes shrubland, grassland, a subdivision, etc., and depending on the type of edge, it can act as a barrier for dispersal; act as a territory boundary; favor certain predators; increase nest predation; and/or reduce reproductive output (Arnold et al. 1996, Johnston 2006). Canopy breaks (the distance between tree top foliage) of as little as 36 feet have been shown to be barriers to golden-cheeked warbler movement (Coldren 1998). Territory boundaries have not only been shown to stop at edges, but golden-cheeked warblers will often avoid nesting near habitat edges (Beardmore 1994, DeBoer and Diamond 2006, Sperry 2007).

Other threats to golden-cheeked warblers include the clearing of deciduous oaks upon which the warbler forage, oak wilt infection in trees, nest parasitism by brown headed cowbirds (Engels and Sexton 1994), drought, fire, stress associated with migration, competition with other avian species, and particularly, loss of habitat from urbanization (Ladd and Gass 1999). Human activities have eliminated warbler habitat throughout the species' range, particularly areas associated with the Interstate 35 corridor between the Austin and San Antonio metropolitan areas.

Range-wide Survival and Recovery Needs

The recovery strategy outlined in the Golden-cheeked Warbler Recovery Plan (Service 1992), which is currently being revised, divides the breeding range of the golden-cheeked warbler into eight regions, or units, and calls for the protection of sufficient habitat to support at least one

self-sustaining viable population in each unit. These recovery units were delineated based primarily on watershed, vegetation, and geologic boundaries (Service 1992).

According to the Golden-cheeked Warbler Population and Habitat Viability Assessment Report, a viable population needs to consist of at least 3,000 breeding pairs (Service 1996). This and other population viability assessments on golden-cheeked warblers have indicated the most sensitive factors affecting their continued existence are population size per patch, fecundity (productivity or number of young per adult), and fledgling survival (Service 1996, Alldredge et al. 2002). These assessments estimated one viable population will need a minimum of 32,500 acres of prime unfragmented habitat to reduce the possibility of extinction of that population to less than five percent over 100 years (Service 1996). Further, this minimum carrying capacity threshold estimate increases with poorer quality habitat (e.g., patchy habitat resulting from fragmentation).

Based on the Golden-cheeked Warbler Recovery Plan (Service 1992), protection and management of occupied habitat and minimization of degradation, development, or environmental modification of unoccupied habitat necessary for buffering nesting habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat (i.e., associated uplands and migration corridors). Current and future efforts to create new and protect existing habitat will enhance the golden-cheeked warbler's ability to expand in distribution and numbers. Efforts, such as land acquisition for golden-cheeked warbler habitat conservation and conservation easements, to protect existing viable populations is critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat.

Several State and Federally owned lands occur within the breeding range of the golden-cheeked warbler, but the overriding majority of the species' breeding range occurs on private lands that have been either occasionally or never surveyed (Service 1992). Currently there are four large golden-cheeked warbler populations receiving some degree of protection: those at the Balcones Canyonlands Preserve in Travis County; the Balcones Canyonlands National Wildlife Refuge in Travis, Burnet, and Williamson counties; Camp Bullis Military Installation in Bexar County; and the Fort Hood Military Reservation in Coryell and Bell counties. There are also two active conservation banks (CB) whose goal is to protect golden-cheeked warbler habitat (acres represent the amount currently under conservation easement): Hickory Pass CB (2,892 acres) in Burnet County and Bandera Corridor CB (2,113.5 acres) in Bandera County.

Environmental Baseline

Status within the Action Area- Tooth Cave ground beetle

The proposed action is located entirely within the Cedar Park and McNeil/Round Rock KFRs. Fuel reduction activities are proposed within the boundaries of two preserves that were set aside as conservation areas for the Tooth Cave ground beetle as a result of prior consultations (Buttercup Creek Cave Preserve and Discovery Wells Cave Preserve). Both Buttercup Creek

and Discovery Wells preserves are managed for the benefit of karst species including the Tooth Cave ground beetle. Two city parks are also included in the action area (Rattling Horn Park and Ranch Trails Park). Buttercup Creek Cave Preserve, Discovery Wells Cave Preserve, and Rattling Horn Park are all within karst zone 1 which includes areas that are known to have endangered cave fauna (Veni 2007). Ranch Trails Park is within karst zone 2 which includes areas having a high probability of suitable habitat for endangered cave fauna. Karst feature surveys were completed by FEMA that confirmed the location of existing karst features as well as identified a number of potential additional features within the action area (please see Figure 3.6 of the BA).

Buttercup Creek Cave Preserve

Buttercup Creek Cave Preserve consists of approximately 163 acres that was conserved in several non-contiguous preserves to protect 25 caves found to contain the Tooth Cave ground beetle. The largest contiguous preserved area is 56 acres. Most of the conservation areas are small and are surrounded by residential homes whose back or side yards are contiguous with the preserve boundary. Fifteen occupied caves for Tooth Cave ground beetle occur within 345 feet of the proposed action within Buttercup Creek Cave Preserve including Nelson Ranch Cave, Convoluted Cave, Grimace Cave, Pig Snout Cave, Harvestman Cave, Whitestone Pit, Stonewell Cave No. 1 and 2 (2 caves), Buttercup Blowhole, Cedar Elm Cave, Good Friday Cave, Salamander Squeeze, TWAS Cave, Animal Canyon Cave, and May BA Cave (please see Figure 1.4 in the BA).

Discovery Wells Cave Preserve

Discovery Wells Cave Preserve consists of approximately 106 contiguous acres that was conserved in one contiguous parcel and contains one cave known to contain the Tooth Cave ground beetle. This preserve is also surrounded by residential development on three sides but several of the cave locations are within the interior of the preserve. Only one karst feature is adjacent to the project site (Three Oaks cave) and the cave entrance is located over 345 feet from the proposed action (please see Figure 1.4 in the BA).

Rattling Horn Park

Rattling Horn Park is a small park adjacent to the Cedar Park youth baseball and softball complex. It is within the Cedar Park KFR, however no cave locations for Tooth Cave ground beetle are within or adjacent to the project site within this park.

Ranch Trails Park

Ranch Trails Park is the easternmost location for the proposed action and occurs within the McNeil/Round Rock KFR. Tooth Cave ground beetle is not known from the McNeil/Round Rock KFR and there are no cave locations within or adjacent to the project site within this park.

Four previous Tooth Cave ground beetle consultations have been completed within the Cedar Park KFR. The section 7 consultation for Highway 183-A (Service File 97-F-416) allowed

impacts to three caves and resulted in the establishment of the Discovery Wells Cave Preserve and the Big Oak Cave Preserve with at least one occupied cave in each location. Three habitat conservation plans (HCPs) resulted in the following amount of take and preserve establishment for Tooth Cave ground beetle:

1. Buttercup Creek HCP (Service Permit TE-836384) permitted the loss of 275 acres of karst zone 1 and preserved 163 acres including 23 cave openings within a series of small preserves,
2. Lakeline Mall HCP (Service Permit TE-762988) permitted the loss of two caves and 62 acres of potential karst habitat and preserved 2 caves; and,
3. Balcones Canyonlands HCP (Service Permit TE-788841) resulted in the loss of 38,349 acres of potential karst habitat and to date has preserved 9 caves for the Tooth Cave ground beetle, seven in the Jollyville Plateau KFR and two in the Cedar Park KFR.

Status within the Action Area- golden-cheeked warbler

Juniper-Oak Woodland, Juniper Woodland, and Juniper Scrubland vegetation communities have been identified within the action area and within the area of the proposed project in each of the 4 preserve/park sites (please see Figure 3.1 in the BA). All three communities provide potential nesting and foraging habitat for the golden-cheeked warbler as they include mature juniper trees with sloughing bark. According to the Williamson County Regional Habitat Conservation Plan (WCRHCP) golden-cheeked warblers have been observed in the past within Discovery Well Cave Preserve and immediately adjacent to Ranch Trails Park (please see Figure 2.1 in the BA).

The Service has issued 60 formal section 7 consultations authorizing over 100,000 acres of golden-cheeked warbler habitat to be impacted and 133 incidental take permits associated with HCPs for the golden-cheeked warbler that cover a permit area of more than 70.1 million acres. Several large section 7 consultations account for over 95% of the total impacts authorized: 1) over 37,900 acres were associated with Department of Defense (DOD) activities on Fort Hood; 2) over 51,500 acres were associated with Natural Resource Conservation Service brush control projects throughout the GCWA's 35 county range; and 3) 5,000 acres were associated with DOD activities on Camp Bullis, less than 15 percent of which was considered occupied. The result of these consultations is over 67,800 acres of golden-cheeked warbler habitat maintained on DOD land and over 22,000 acres of private land preserved and/or maintained for the benefit of the GCWA.

Recent large scale 10(a)(1)(B) incidental take permits issued that include golden-cheeked warbler as a covered species include the Oncor HCP, Hays County HCP, Lower Colorado River Authority Competitive Renewable Energy Zone HCP, and the Comal County HCP. In total these four HCPs authorize approximately 18,363 acres of impacts to golden-cheeked warbler habitat and at full performance would preserve 22,988 acres of golden-cheeked warbler habitat.

Six previous section 7 consultations that include take of golden-cheeked warbler have been completed for actions within Williamson County resulting in the loss of approximately 440 acres and the preservation of approximately 407 acres of golden-cheeked warbler habitat.

Seven previous HCPs that include take of golden-cheeked warbler have been completed for actions within Williamson County:

1. Six smaller scale HCPs authorized removal of approximately 478 acres of golden-cheeked warbler habitat and preservation of approximately 516 acres of golden-cheeked warbler habitat; and,
2. The Williamson County regional habitat conservation plan (TE-181840) authorized removal of 6,000 acres of golden-cheeked warbler habitat and preservation of 6,000 acres of golden-cheeked warbler habitat (if a 1:1 offset ratio is assumed) either within Williamson County or within a Service approved conservation bank.

Effects of the Proposed Action

Tooth Cave ground beetle

Previous karst survey efforts within the action area have provided valuable information in determining the extent of karst species occupation within and adjacent to the project site. In particular karst surveys within the two preserve sites have informed the number of occupied caves that are within 345 feet of the project site. However, a precise mechanism for predicting the number of individuals that may actually be adversely affected by the proposed project over time due to habitat loss can be somewhat limited. It is more accurate and appropriate to state that, over time an area that has been observed to support these species may or may not be rendered unsuitable. Therefore, in this document adverse effects are characterized by the loss or potential loss of areas known or likely to be occupied (including habitat that these species depend upon e.g. cave cricket foraging area (Taylor et al. 2005)), the relative quality of which is in part determined by the levels of prior observed utilization, as well as the assessment of habitat quality.

Because of the reasons described above, it is not possible to estimate the number of individuals of Tooth Cave ground beetle that would be taken by the proposed project. To the best of our ability, and with the limitations described above, we have attempted to estimate the potential for adverse effects to karst features known to be occupied by the Tooth Cave ground beetle.

The proposed project is expected to result in both direct and indirect effects to Tooth Cave ground beetle. Direct effects to the Tooth Cave ground beetle including alteration of prey base and disruption of nutrient input into the karst feature in areas where vegetation removal and brush clearing occurs within the cave cricket foraging area of an occupied karst feature, within the surface drainage basin of an occupied karst feature, or occurs above the subsurface drainage basin of an occupied karst feature. Indirect effects (those project-related effects that are reasonably certain to occur but are later in time) would occur in areas where due to the disturbance of surface vegetation RIFA or other invasive species may colonize within the cave cricket foraging areas of occupied karst features. Additional indirect effects could include fragmentation and isolation of the area around occupied karst features post-construction. These

effects would be short-term lasting from one to two growing seasons as the project area re-vegetates. Effects that result from the proposed project are not anticipated to render any of the existing occupied karst features unsuitable.

FEMA has incorporated avoidance and minimization measures into the project description that ensure that direct effects through ground disturbance are minimized, particularly within 345 feet of features occupied by the Tooth Cave ground beetle. Within 100 feet of occupied karst features there will be no mechanical trimming and hand cutting of vegetation will be used. Indirect effects will also be minimized by re-seeding treated areas with a native seed mix within 345 feet of occupied caves and by requiring RIFA treatment within this same area following project completion. RIFA within the preserve sites will continue to be treated twice annually as a component of the maintenance program for the preserve sites.

It is expected that direct and indirect effects to the Tooth Cave ground beetle would occur through vegetation removal within the cave cricket foraging area and the surface and subsurface drainage area for 12 known karst features (see Figure 1-6 in the BA) which are occupied by Tooth Cave ground beetle. The 12 known karst features are found within the Buttercup Creek Cave Preserve system. There are several karst features within the Discovery Well Cave Preserve, however those features are further than 345 feet from the proposed project location along the eastern and northern border of the preserve and are not anticipated to be directly or indirectly affected by the proposed action. There are no known locations for Tooth Cave Ground Beetle within Rattling Horn Park and Ranch Trails Park.

Golden-cheeked warbler

Direct and indirect effects are likely to occur to the golden-cheeked warbler as a result of the proposed activities primarily due to the alteration of habitat outside of the breeding season. All four sites within the action area have the potential to be utilized by golden-cheeked warblers either as nesting habitat or as post-nesting foraging/fledging habitat. Prior species surveys identified both Discovery Well Cave Preserve and Ranch Trails Park as areas where golden-cheeked warblers have been detected during past nesting seasons. Removal and trimming of vegetation to accomplish fuel reduction activities would result in a reduced amount of breeding habitat available to the species during the breeding season and would result in take in the form of harm. Indirect effects would include short-term changes in prey abundance as a result of vegetation alteration as well as further fragmentation of golden-cheeked warbler habitat.

Hazardous fuel reduction activities are anticipated to directly and indirectly impact up to 24.2 acres of golden-cheeked warbler habitat within Discovery Wells Cave Preserve, Buttercup Creek Cave Preserve, Rattling Horn Park, and Ranch Trails Park. This is based on an estimated width of fuel reduction treatment of no more than 25 feet between city-owned land and private residences, removal of hazardous fuels by clearing brush and combustible materials, and cutting tree branches to heights of up to 8 to 10 feet from ground level. However, the majority of the impacts will occur to trees and branches less than 10 feet above the ground, and the treatments

will not result in a reduction in canopy cover. Since golden-cheeked warblers often select nest locations within the top third of the nest tree and at heights greater than 6.5 feet above the ground (Groce et al. 2010), the effects of hazardous fuel treatments to the golden-cheeked warbler would be minimized by the type of treatment chosen.

Additionally a long-term beneficial effect to golden-cheeked warbler habitat is expected from a reduction in the potential for catastrophic wildfire as a result of the proposed activity. The loss of a substantial amount of golden-cheeked warbler habitat from wildfires on Fort Hood in 1996 resulted in a decrease in golden-cheeked warbler abundance even after 10 years following the fire (Baccus et al. 2007). Therefore, any activities in golden-cheeked warbler habitat that reduce the likelihood of a wildfire or reduce the intensity of wildfire when one occurs will provide indirect benefits to the species.

Cumulative Effects

Cumulative effects including the effects of future State, local, or private actions that are reasonably certain to occur in the action area are 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.

An undetermined number of future land use conversions and habitat conversions are not subject to Federal authorization or funding and may alter the habitat or increase incidental take of species covered by this opinion and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) increased development and impervious cover due to urbanization; (2) modification of drainage areas, (e.g., dams, bank stabilization, flood control); (3) recreational activities; (4) contaminated runoff from agriculture and urbanization; (5) subsurface habitat alteration (e.g., quarrying or mining); and, (6) habitat alteration by invasive exotic/non-native species.

It is anticipated that the City of Cedar Park will continue to manage the Discovery Wells Cave Preserve and the Buttercup Creek Cave Preserve for the benefit of listed species pursuant to consultations for Highway 183A (97-F-416) and the Buttercup Creek subdivision (TE-836384) under which the preserves were created.

Conclusion

After reviewing the current status of the Tooth Cave ground beetle and the golden-cheeked warbler, 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 proposed action is not likely to jeopardize the continued existence of the Tooth Cave ground beetle or the golden-cheeked warbler. Hazardous fuel reduction activities will be limited to the minimum amount of vegetation and ground disturbance necessary to complete the proposed activity. Conservation measures proposed by FEMA will minimize the potential for harm to individuals by removing vegetation outside of the golden-cheeked warbler breeding season and hand cutting vegetation

within 100 feet of occupied karst features. Further, the proposed action will minimize the risk of catastrophic wildfire within two existing karst preserves and two parks and help to maintain the biological integrity of these areas in the long-term. Critical habitat has not been designated for either species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is further defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding and sheltering (50 CFR §17.3). Harm is also further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns, including breeding, feeding, and sheltering. Incidental take is defined by the Service 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 this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by the Federal Emergency Management Agency so that they become binding conditions of any authorization issued to implement a project covered by this biological opinion, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Federal Emergency Management Agency has a continuing duty to regulate the activity covered by this incidental take statement. If the Federal Emergency Management Agency (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the authorizations, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Federal Emergency Management Agency must report the progress of the action and its impact on the species to the Austin Ecological Services Field Office as specified in the incidental take statement. [50 CFR 402.14(i)(3)].

Amount or Extent of Take

The Service anticipates incidental take of Tooth Cave ground beetles and the golden-cheeked warblers will occur as a result of the proposed action. Individual Tooth Cave ground beetles and the golden-cheeked warblers are difficult to detect unless they are observed, undisturbed, in their environment. The Service anticipates the following amount of incidental take from the hazardous fuel reduction activities within the City of Cedar Park:

1. No more than 12 karst features known to contain Tooth Cave ground beetles may be disturbed as a result of actions authorized under this biological opinion.
2. No more than 24.2 acres of golden-cheeked warbler habitat may be disturbed as a result of actions authorized under this biological opinion.

Some City of Cedar Park personnel are currently authorized for take by their individual section 10(a)(1)(A) permits. Any work conducted pursuant to valid permits will be covered for incidental take as prescribed in the individual permit conditions.

Effect of the Take

In the accompanying biological opinion and conference opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy of the Tooth Cave ground beetle and the golden-cheeked warbler due to the short-term and limited effects associated with the proposed action. The hazardous fuel reduction project is anticipated to benefit the Tooth Cave ground beetle and the golden-cheeked warbler in the long-term by minimizing the risk of catastrophic wildfire within two existing karst preserves (Discovery Wells Cave Preserve and Buttercup Creek Cave Preserve) and two parks. Critical habitat has not been designated for either species; therefore, none will be affected.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of Tooth Cave ground beetles and the golden-cheeked warblers: The Federal Emergency Management Agency shall:

1. Minimize harassment and harm of Tooth Cave ground beetles and the golden-cheeked warblers during activities associated with hazardous fuel reduction described in this biological opinion and the accompanying attached Biological Assessment, City of Cedar Park, Texas, Hazardous Fuels Reduction Project, Williamson County, Texas dated September, 2014.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Federal Emergency Management Agency must comply with the following terms and conditions that implement the reasonable and prudent measure described above and outlined reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement the reasonable and prudent measure:
 - A. All personnel involved in any authorized activity covered by this biological opinion shall be informed of these terms and conditions prior to the implementation of the authorized activity;
 - B. The hazardous fuel reduction activities will be completed outside of the golden-cheeked warbler breeding season (March 1 through August 31);

C. Karst buffer zones listed below will be marked prior to initiation of the proposed activity and disturbance within these zones will be minimized:

- 100 feet from cave openings (no mechanical trimming or cutting may occur),
- 345 feet from cave openings (no mulch can be placed, hot water treatments for Red Imported Fire Ants (RIFA) must be conducted), and
- 500 feet from cave openings (no refueling, equipment staging, or storage of fuels may occur in this area).;

D. After completion of activities covered by this biological opinion that result in habitat alteration, any temporary fill, construction material, or other debris shall be removed; and,

E. The Federal Emergency Management Agency shall ensure compliance with the Reporting Requirements below to assist in future construction project decisions to avoid and minimize effects on Tooth Cave ground beetles, golden-cheeked warblers, and their associated habitats.

Reporting Requirements

Where temporary or permanent adverse effects occur, a post-activity report shall be forwarded to the Field Supervisor, Austin Ecological Services Field Office, within 60 calendar days of the completion of such activities. This report shall detail (1) dates that activities occurred; (2) pertinent information concerning the success in implementing the measures, as appropriate; (3) an explanation of failure to meet such measures, if any; (4) known project effects on species listed pursuant to the Act, if any; (5) occurrences of incidental take of species listed pursuant to the Act, if any; and (6) other pertinent information.

The Austin Ecological Services Field Office is to be notified within three working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Field Supervisor at (512) 490-0057.

Review Requirements

The reasonable and prudent measure, with its implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. With implementation of this measure, the Service believes that no more than 12 karst features known to contain Tooth Cave ground beetles and 24.2 acres of golden-cheeked warbler habitat will be directly and/or indirectly affected.

If, during the course of the authorized activities, this level of incidental take is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measure provided. The Federal Emergency Management Agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measure. This biological opinion will expire five years from the date of issuance. Issuance of a new biological opinion will be subject to evaluation of the recovery of the species.

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 recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibilities for this species.

1. The Federal Emergency Management Agency should assist the Service in the implementation of the recovery plans for the Tooth Cave ground beetle and the golden-cheeked warbler;
2. The Federal Emergency Management Agency and the City of Cedar Park should incorporate into bidding documents the terms and conditions of this biological opinion, when appropriate;
3. The Federal Emergency Management Agency, in partnership with the Service, should develop guidelines for Federal Emergency Management Agency permitted projects that will reduce adverse effects of routine projects on listed species and their habitat. Such actions may contribute to the delisting and recovery of listed species by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat; and,
4. In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on hazardous fuel reduction activities within Discovery Wells Cave Preserve, Buttercup Creek Cave Preserve, Rattling Horn Park, and Ranch Trails Park. As provided in 50 CFR Sec. 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 consultation; (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 biological 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.

If you have any questions regarding this biological opinion, please contact Charlotte Kucera at (512) 490-0057, extension 224.

Sincerely,



Adam Zerrenner
Field Supervisor



cc: Dorothy Weir, Federal Emergency Management Agency, Denton, Texas

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