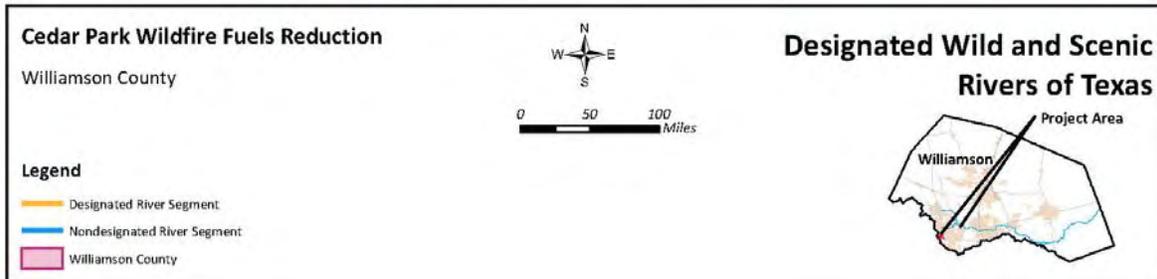
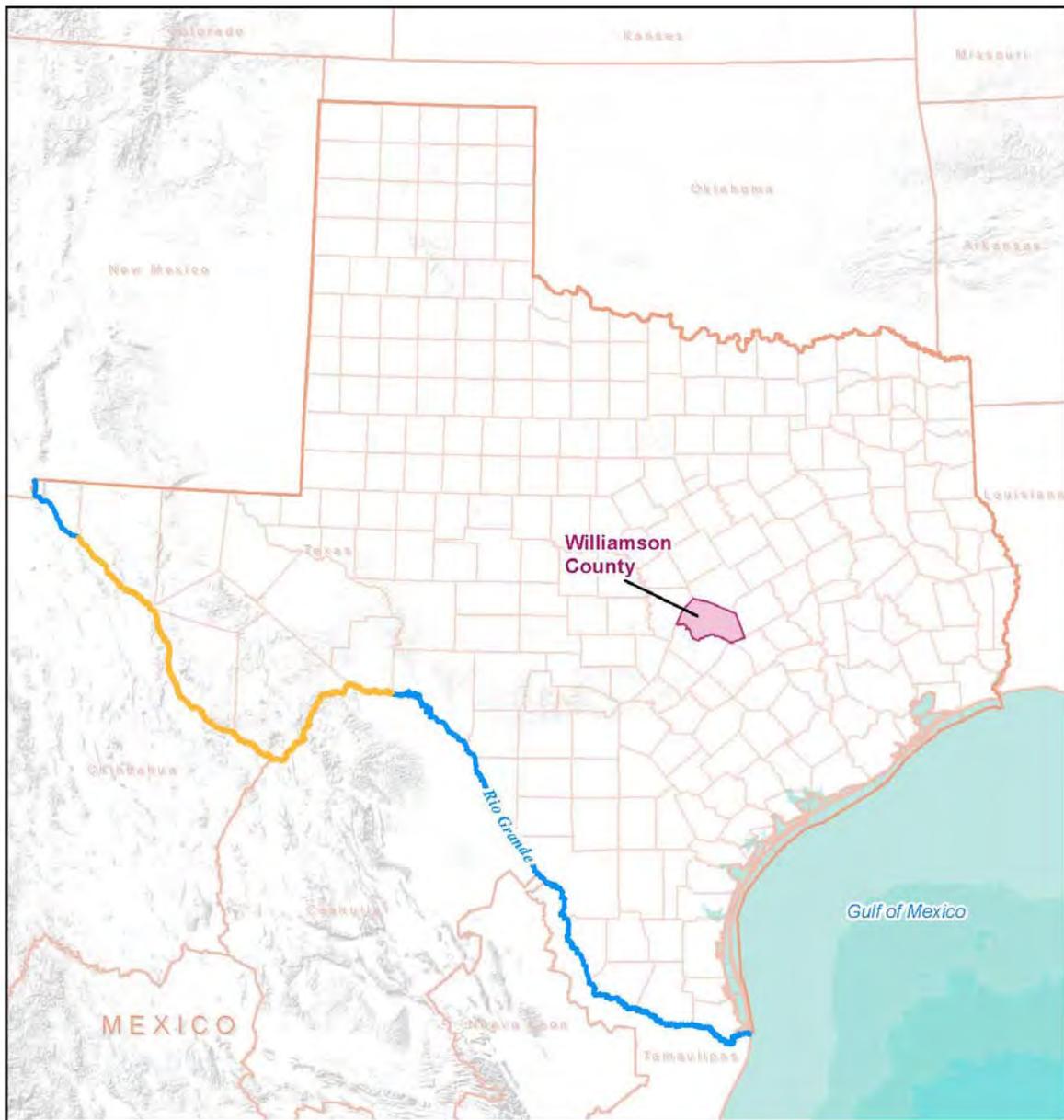


Appendices

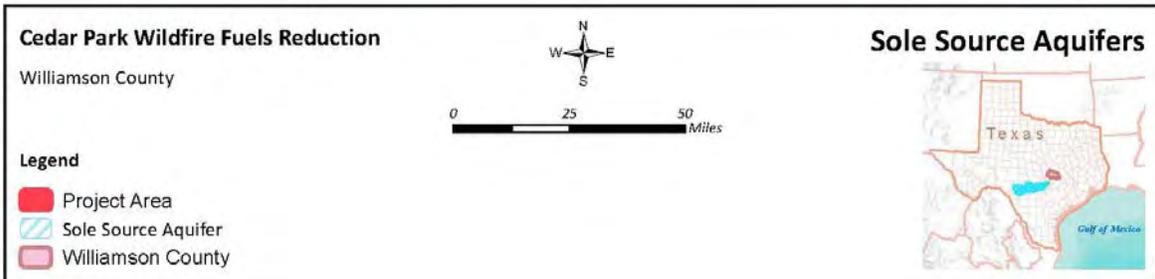
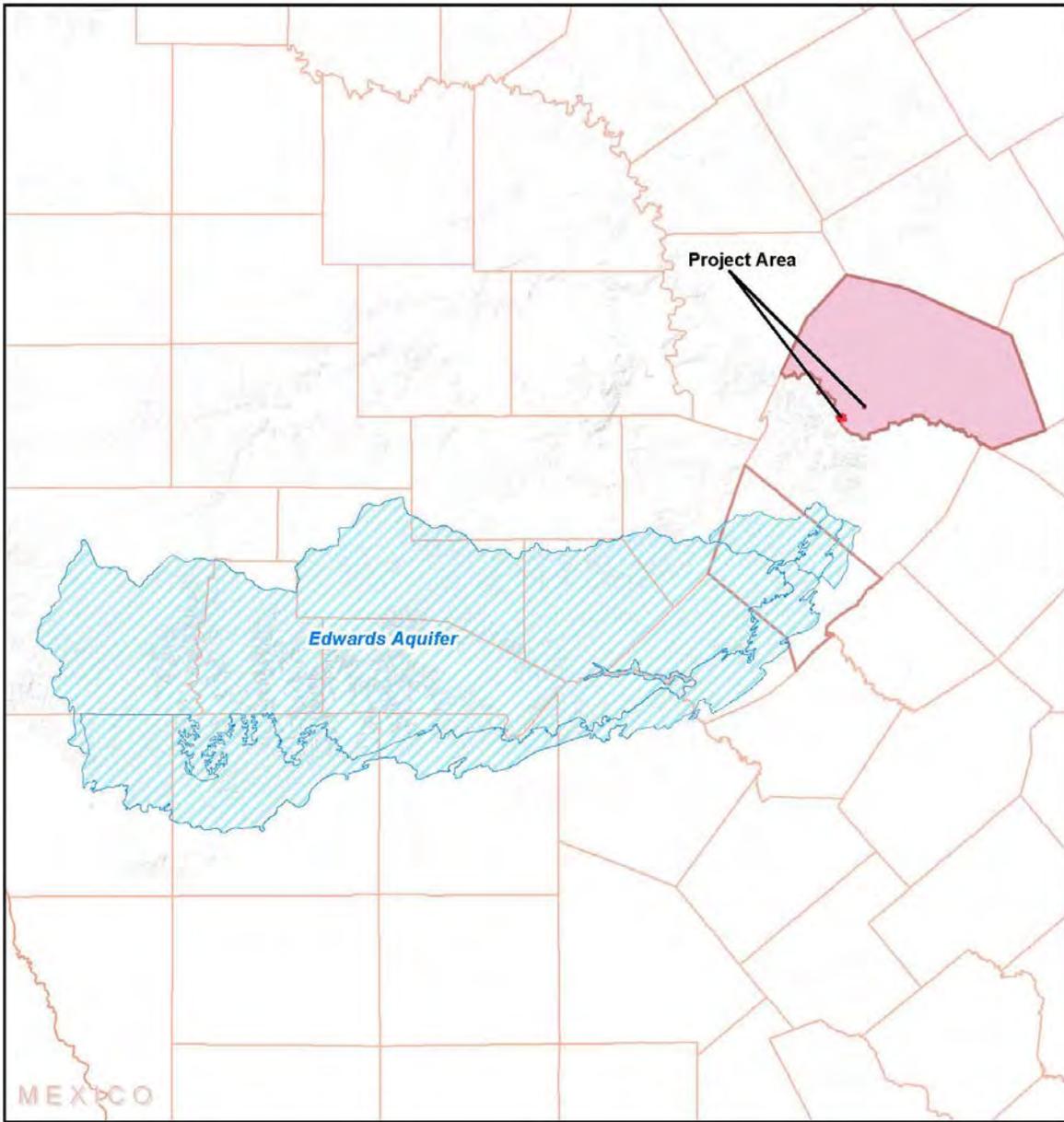
Appendix A

Water Resources Data

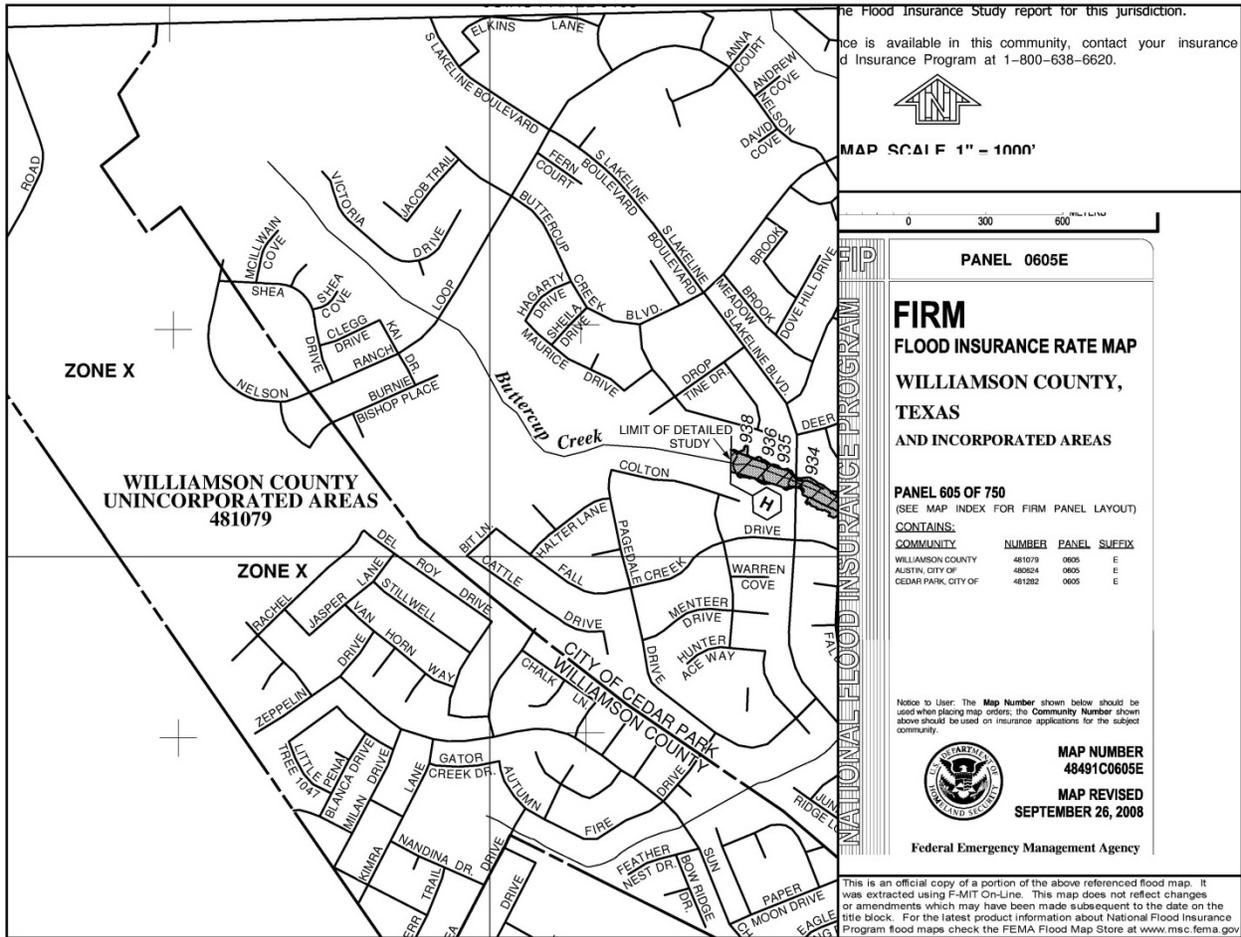
1. Wild and Scenic Rivers Map
2. Sole Source Aquifer Map
3. FEMA Federal Insurance Rate Maps
4. Executive Order 11988 - Floodplain Management Eight-Step Decision Making Process



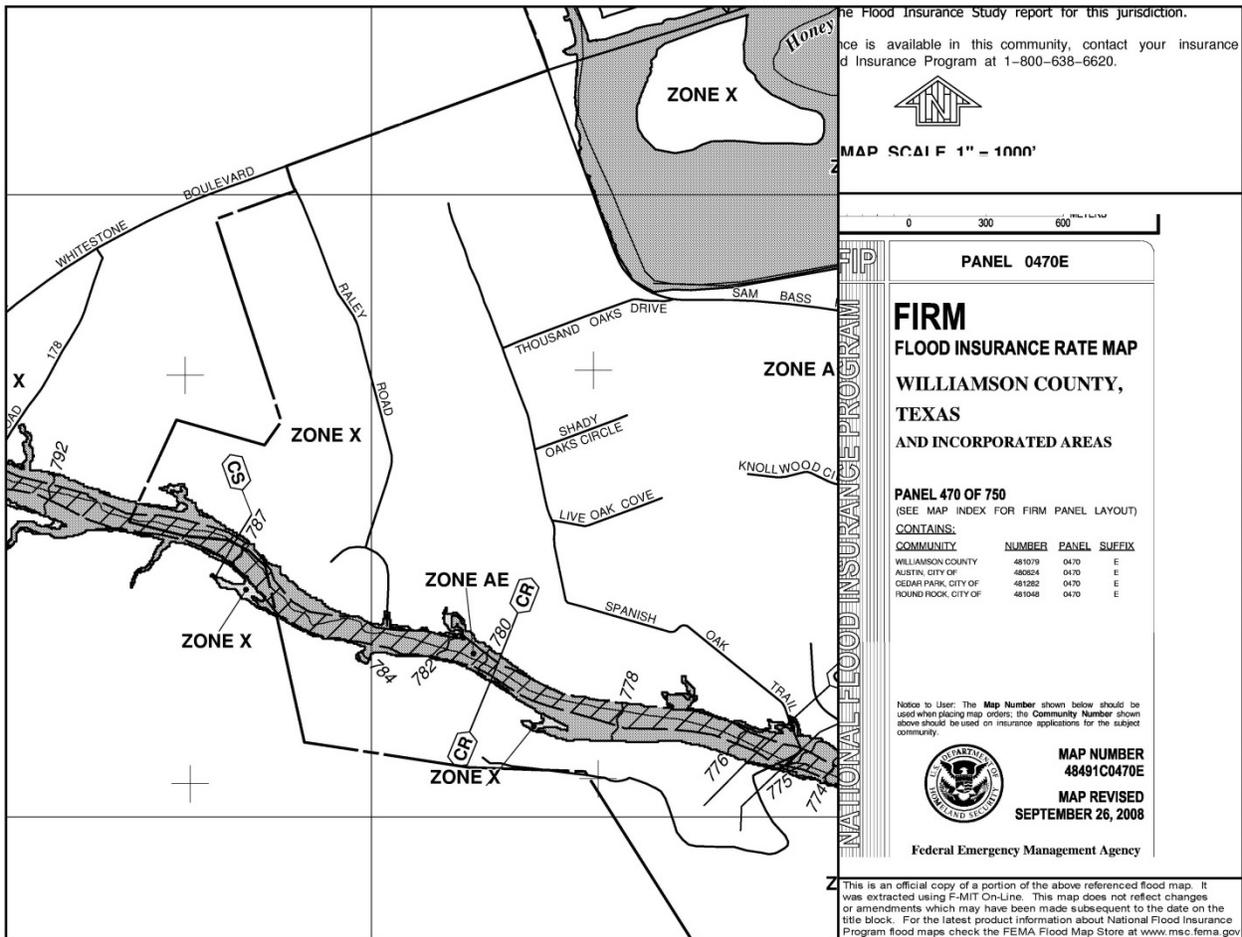
Data Sources: NPS, TNRIS
Service Layer Credits: Sources: Esri, USGS, NOAA



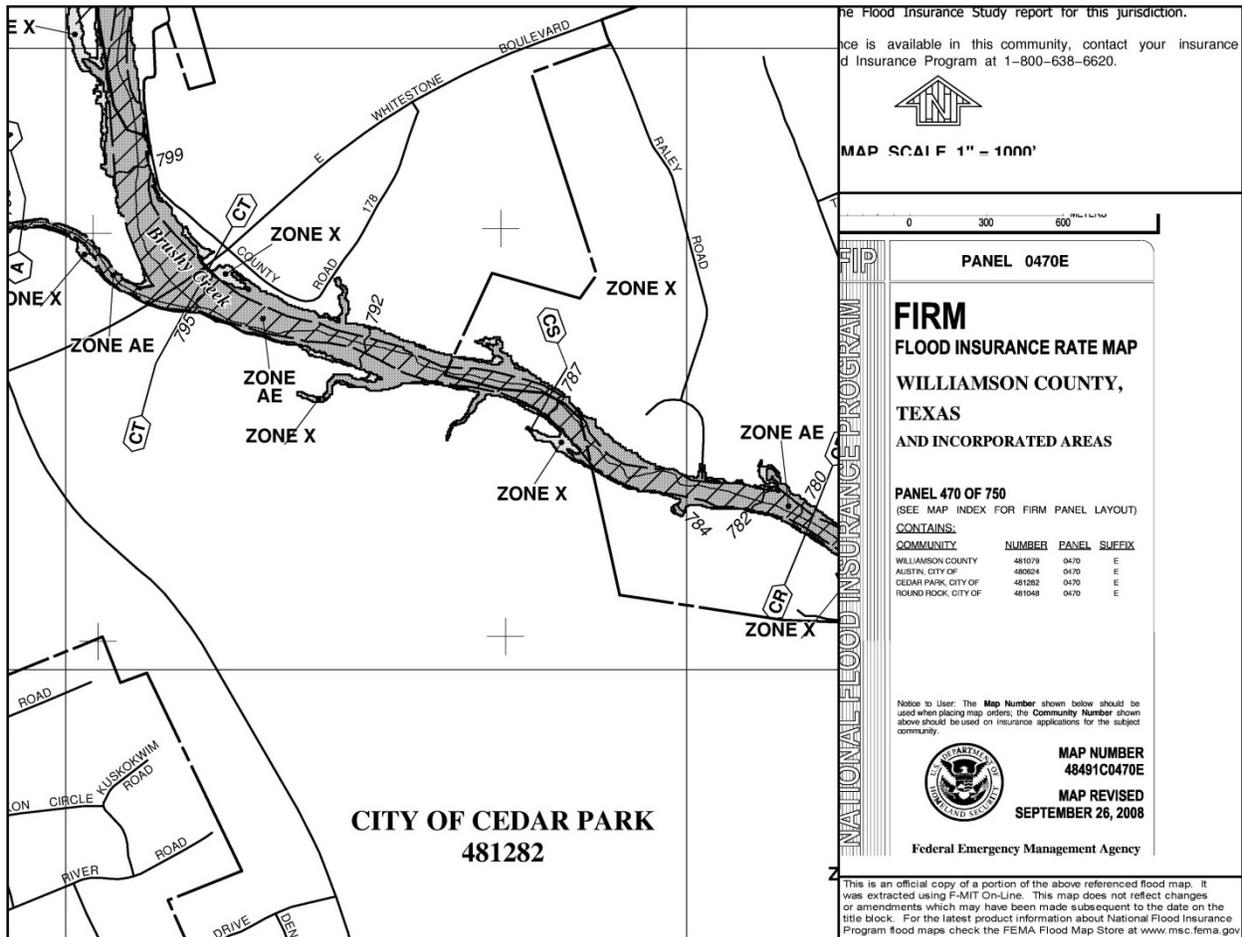
Data Sources: EPA, TNRI/S
Service Layer Credits: Sources: Esri, USGS, NOAA



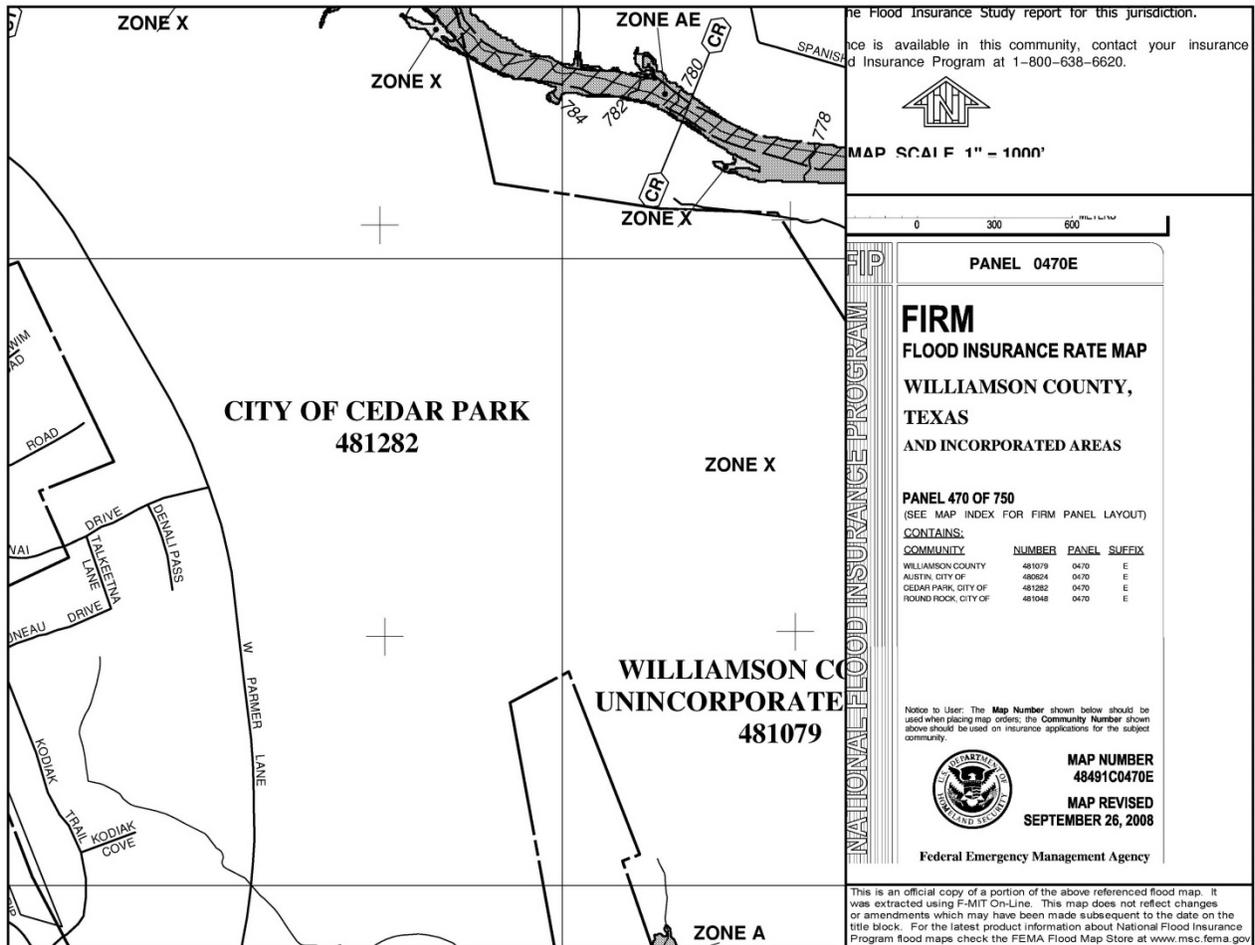
Appendix A

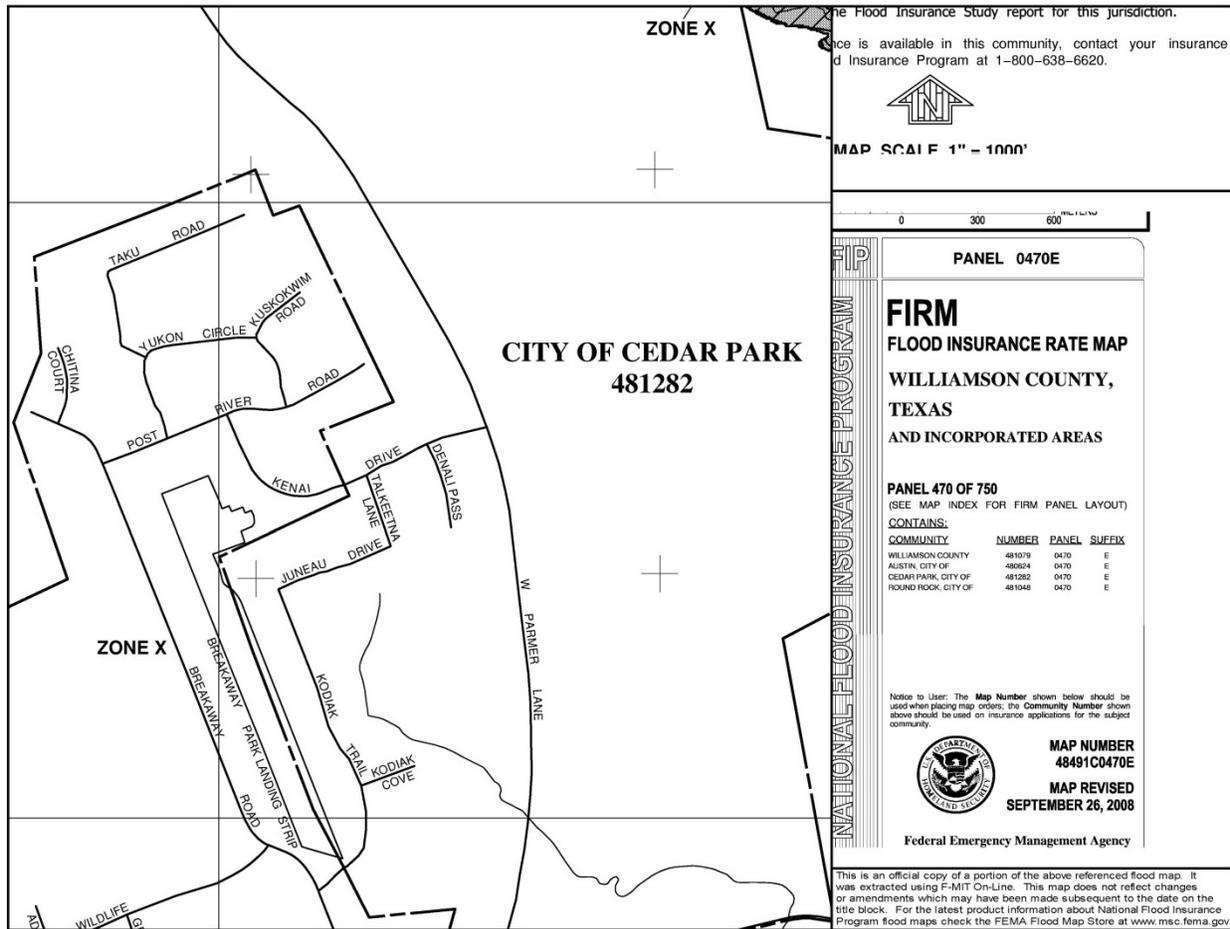


Appendix A



Appendix A





For the Flood Insurance Study report for this jurisdiction. If flood insurance is available in this community, contact your insurance agent or the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

PANEL 0470E

FIRM
FLOOD INSURANCE RATE MAP
WILLIAMSON COUNTY,
TEXAS
AND INCORPORATED AREAS

PANEL 470 OF 750
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

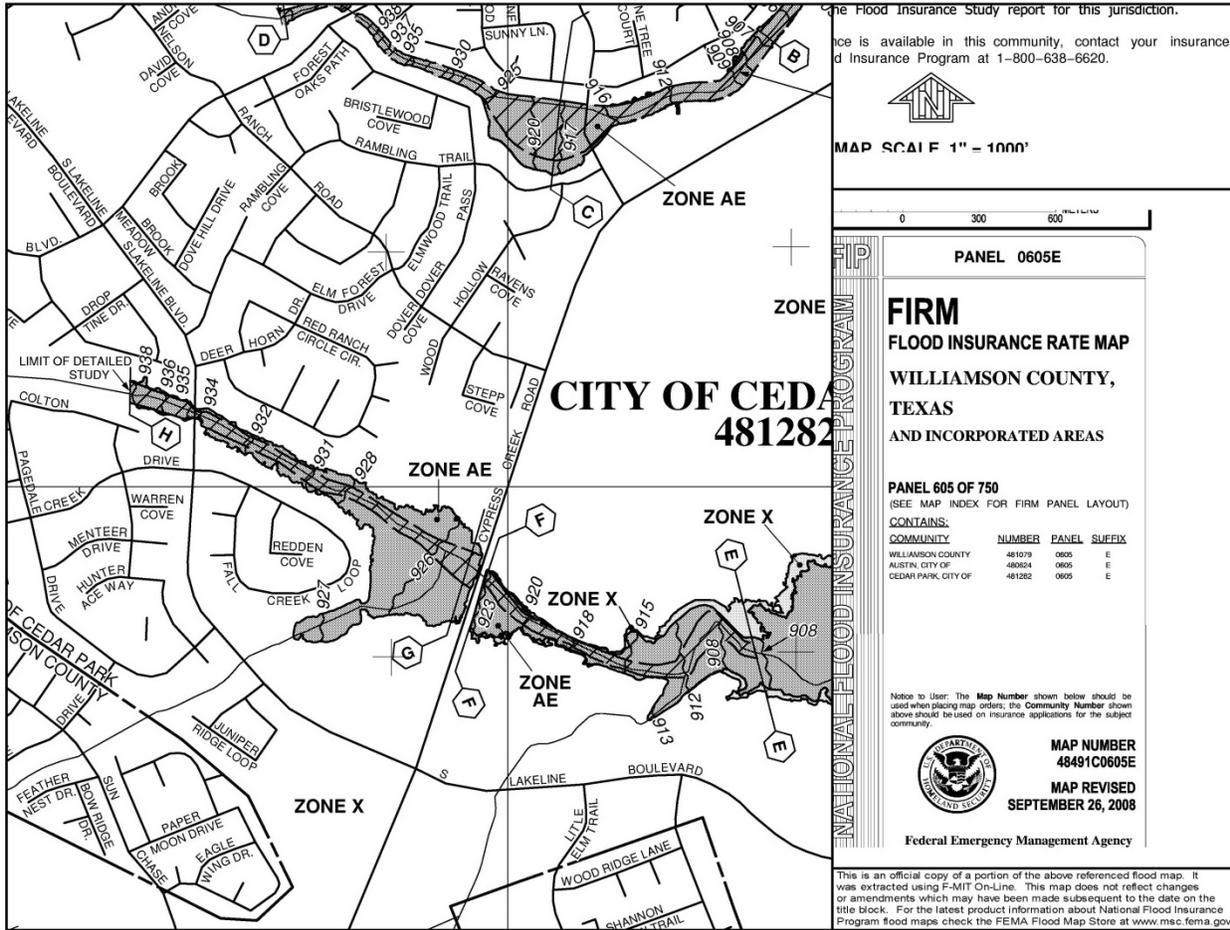
COMMUNITY	NUMBER	PANEL	SUFFIX
WILLIAMSON COUNTY	481019	0470	E
AUSTIN, CITY OF	480624	0470	E
CEDAR PARK, CITY OF	481282	0470	E
ROUND ROCK, CITY OF	481948	0470	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
48491C0470E
MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Executive Order (EO) 11988 – Floodplain Management Eight-Step Decision Making Process

EO 11988 (Floodplain Management) requires federal agencies “to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of the floodplain and to avoid direct or indirect support of floodplain development whenever there is a practical alternative.”

This eight-step process is applied to the proposed City of Cedar Park Hazardous Fuels Reduction project. The proposed project involves hazardous fuels reduction along the border of the Buttercup Creek and Discovery Well Cave Preserves, Rattling Horn Park, and Ranch Trails Park, and other city-owned greenbelts in order to reduce the risk of damage to structures from wildfire. Portions of the proposed project area are within the 100-year floodplain of Cluck Creek Tributary 1. The steps in the decision-making process are as follows:

Step 1 Determine if the proposed action is located in the Base Floodplain

A small portion of the work area will be conducted within the 100-year floodplain (“base floodplain”) of Cluck Creek Tributary 1 according to the Flood Insurance Rate Maps (FIRMs) (panel number 48491C0605E, dated 9/26/2008). The floodplain in relation to the proposed project is depicted on **Figure 4.9** of the environmental assessment (EA). The proposed project would not result in the construction of any structures within the 100-year floodplain nor would it involve any fill or excavation within the floodplain.

Step 2 Early public notice (Preliminary Notice)

A public notice concerning the proposed hazardous fuels reduction project will be published in the *Cedar Park-Leander Statesman* newspaper along with the Notice of Availability of the draft EA document. The *Cedar Park-Leander Statesman* is the local newspaper for the cities of Cedar Park and Leander, including the floodplain area of Cluck Creek Tributary 1 where the proposed action is located.

Step 3 Identify and evaluate alternatives to locating in the base floodplain

The no action alternative is described in **Section 3** of the EA. The no action alternative would not meet the purpose and need for the project and is not a practicable alternative.

An alternative that would relocate the project out of the floodplain is described here. A portion of the proposed project is located within the 100-year floodplain of Cluck Creek Tributary 1. In order to protect homes adjacent to greenbelts and parks, hazardous fuels reduction is needed along the border of these parks and greenbelts. Relocating the proposed project area to avoid the floodplain would require that the project area move further into the parks and greenbelts and away from the border. This alternative was considered but rejected because it would not protect residences adjacent to the open spaces. An alternative that would relocate the project outside of the floodplain would not meet the project purpose and need and is not a practicable alternative.

Another alternative considered was a complaint-driven approach that would be narrow in scope and address a smaller area of hazardous fuels. Under the complaint-driven approach, the city would conduct small hazardous fuels reduction projects with limited impact instead of a comprehensive program to mitigate high risk areas. Limited resources would dictate where and when the hazardous fuels reduction would be conducted. Under this alternative, the city would continue to be at an elevated risk for the spread of a catastrophic wildfire, and the probability of loss of human life and property would continue to be unacceptably high. For these reasons, the complaint-driven approach is not a practicable alternative.

Step 4 Identify impacts of proposed action associated with occupancy or modification of the floodplain

Impact on natural function of the floodplain

The proposed action would not affect the functions and values of the 100-year floodplain. The proposed action would not place any structures or fill within the floodplain that would impede or redirect flood flows nor would it result in any excavation. No structures would be constructed within the floodplain, and minimal soil disturbance would occur within the floodplain. Although the proposed action would reduce risk to homes adjacent to greenbelts and parks, the proposed action would not facilitate any development within the floodplain.

The functions of the floodplain to provide flood storage and conveyance, filter nutrients and impurities from runoff, reduce flood velocities, reduce flood peaks, moderate temperature of water, reduce sedimentation, promote infiltration and aquifer recharge, and reduce frequency and duration of low surface flows will remain intact after the implementation of this project. There will be minor short-term impacts to water quality during the implementation phase of the project. Floodplains also provide services in the form of providing fish and wildlife habitat, breeding, and feeding grounds. These floodplain values will not be significantly adversely impacted and the overall integrity of the ecosystem will not be impacted. FEMA has determined the project may affect, but will not likely adversely affect one endangered bird species, one threatened salamander, and one endangered invertebrate, and will not adversely modify or otherwise affect designated critical habitat. The project could adversely affect another endangered bird species and one endangered invertebrate. A variety of avoidance and minimization measures will be included in the project to reduce potential effects on these species. The proposed action would have negligible impacts to native species and their habitats and population levels of native species would not be affected. There is the potential for adverse impacts to migratory bird species if vegetation removal activities are conducted during the breeding season. The proposed action will not adversely affect the societal and recreational benefits provided by the floodplain in these natural areas. Open space and recreational uses in the parks and preserves will not be affected by the proposed action.

The fire hazard reduction activities would reduce the potential for the negative effects of a major wildfire on soils if a wildfire occurs. A wildfire could alter the cycling of nutrients; the physical and chemical properties of soils; and the temperature, moisture, and biotic characteristics of the existing soils. In the event of a major wildfire, more bedrock could be exposed to direct rainfall, which would increase the rate of erosion of the formation. These primary impacts from a wildfire

could also result in decreased infiltration and increased runoff, which often causes increased erosion. These potential negative effects of a major wildfire on the natural floodplain functions would be reduced through implementation of the proposed action.

Impact of the flood water on the proposed facilities

The proposed action does not include any structures or facilities within the floodplain; therefore, no facilities would be affected by flood water in the floodplain of Cluck Creek Tributary 1. The proposed action also does not include any fill, excavation, or ground disturbance that could affect flood flows or elevations. Cut vegetation and mulch will not be placed within the floodplain. Potential floodwaters will not affect the project.

Step 5 Design or modify the proposed action to minimize threats to life and property and preserve its natural and beneficial floodplain values

The objective of the proposed action is to reduce the risk of wildfires impacting homes along the boundary of parks, preserves, and greenbelts. No structures are or would be located in the floodplain as a result of the proposed project. The proposed hazardous fuels reduction would result in removal of dead and dying trees, thinning of small trees and underbrush, and trimming of the lower branches of large trees. The proposed action would have no effect on the natural and beneficial values of the floodplain.

Many of the impacts discussed above are considered insignificant or beneficial to the floodplain. The proposed action to reduce fuel loads contributes to the conservation of the floodplain and its natural and beneficial values. Short-term water quality impacts will be mitigated by the implementation of BMPs.

Impacts to the federally endangered Black-capped vireo, Golden-cheeked warbler, Bone Cave harvestman, Tooth Cave ground beetle, and the threatened Jollyville Plateau salamander will be mitigated by the avoidance and minimization measures outlined in the consultation with the U.S. Fish and Wildlife Service. Impacts to migratory bird species will be minimized by seasonal restrictions such that work is conducted outside of nesting season. For any work in the floodplain, the City of Cedar Park will be required to coordinate with the local floodplain administrator and obtain any required permits prior to initiating work. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

Step 6 Determine if proposed action is practicable and re-evaluate alternatives

The proposed action would not expose any segment of the population to flood hazards because it does not include a housing component and will not facilitate development in the floodplain. The proposed action would not change the current flood hazard because it would not impede or redirect flood flows. The project would not disrupt floodplain values because it would not change water levels in the floodplain. Therefore, it is practicable to implement the proposed action within the floodplain. Alternatives consisting of locating the project outside of the floodplain or taking no action are not practicable because these alternatives would not reduce

wildfire risks to people and homes along the boundary of greenbelts and parks. FEMA maintains that the proposed action alternative is the only practicable alternative to meet the purpose and need of the project. This section may be revised following public comment on the EA and this 8-step evaluation if significant comments are received regarding floodplain impacts.

Step 7 Findings and public explanation (Final Notification)

Step 7 requires that the public be provided with an explanation of any final decision that the floodplain is the only practicable alternative. In accordance with 44 CFR §9.12, the City of Cedar Park must prepare and provide a final public notice 15 days prior to the start of any hazardous fuels reduction activities in the floodplain. Documentation of the final public notice is to be forwarded to FEMA for inclusion in the permanent project files.

Step 8 Implement the action

Step 8 is the review of the implementation and post-implementation phases of the proposed action to ensure that the requirements stated in 44 CFR Part 9.11 are fully implemented. The proposed hazardous fuels reduction project will be conducted in accordance with applicable floodplain development requirements.

Conditions identified in Step 5 would be implemented.

Appendix B

Biological Site Visit Field Notes

Appendix B Table 1. Habitat Type Summary

Habitat Type	Dominant Plant Species	Animal Species Observed
Live Oak Savannah	Canopy: Live oak, sparse Ashe juniper, and cedar elm. 60 percent cover. Mid-story: Prickly pear cactus, sparse Ashe juniper and live oak saplings 15 percent cover. Ground cover: Prickly pear cactus, little bluestem, panicum sp., dewberry, bermudagrass, and rosette grass. 95 percent cover. 5 percent bare ground with limestone cobble.	Turkey vulture, northern mockingbird, Eurasian collared-dove, mourning dove, house wren, red-bellied woodpecker, ruby-crowned kinglet, ground dove, white-tailed deer, common raccoon.
Maintained ROW/Access	Canopy: live oak, post oak, Ashe juniper. 10 percent cover. Mid-story: Texas persimmon, live oak, prickly pear cactus. 15 percent cover. Ground cover: little bluestem, Texas crabgrass, bermudagrass, prickly pear cactus, Johnson grass, western ragweed. 95 percent cover.	Carolina chickadee, blue jay, field sparrow, turkey vulture, scissor-tailed flycatcher, grey squirrel.
Juniper Oak Woodland	Canopy: Ashe juniper, live oak, few scattered post oak. 95 percent cover. Mid-story: Texas persimmon, prickly pear cactus. Cover 5 percent. Ground cover: little bluestem, prickly pear cactus. 10 percent cover.	Blue jay, house wren, Eurasian collared dove, mourning dove, white winged dove northern cardinal, tufted titmouse, American robin, grey fox, cotton-tailed rabbit, Texas spiny lizard.
Juniper Woodland	Canopy: Ashe juniper, few sparse live oak and mesquite. 80 percent cover. Mid-story: Absent. 0 percent cover. Ground cover: little bluestem, prickly pear cactus. 15 percent cover. 5 percent bare ground with limestone bedrock or cobble.	Blue jay, field sparrow, northern mockingbird, ruby-crowned kinglet, mourning dove, white-winged dove, Eurasian collared dove, fence lizard, cotton-tailed rabbit, black-tailed jackrabbit.
Juniper Scrubland	Canopy: Ashe juniper. 0 to 60 percent cover. Mid-Story: Ashe juniper, prickly pear cactus, salt cedar. 30 percent cover. Ground cover: little bluestem, Johnson grass, western ragweed, morning glory. 70 percent cover.	White-winged dove, Carolina chickadee, tufted titmouse, blue jay, mourning dove.
Mesquite Scrubland	Canopy: live oak, Ashe juniper, cedar elm. 15 percent cover. Mid-story: Ashe juniper, mesquite, salt cedar. 40 percent cover. Ground cover: little bluestem, western ragweed, Texas crabgrass. 50 percent cover. 5 percent bare ground.	None observed.
Maintained Easement	Canopy: Few scattered Ashe juniper and live oaks. Mid-story: none. Ground cover: bermudagrass, western ragweed. 90 percent cover. 10 percent bare ground.	Northern mockingbird, house wren.

Appendix B Table 2. Listed Species Summary

Species (Common) ¹	Species	Federal Status	State Status	Habitat Description	Habitat Present in Survey Areas (CDM Smith Desktop Assessment)	Habitat Present in Survey Area (Field Assessment)
Amphibians						
Georgetown salamander	<i>Eurycea naufragia</i>	PE	None	Endemic; known from springs and waters in and around town of Georgetown in Williamson County.	Unlikely	Unlikely to occur, suitable habitat does not exist. No spring fed surface waters present.
Jollyville Plateau salamander	<i>Eurycea tonkawae</i>	PE	None	Known from springs and waters of some caves north of the Colorado River.	Unlikely	Potential to occur, suitable habitat present. Karst features present.
Birds						
American Peregrine falcon	<i>Falco peregrinus anatum</i>	DL	T	Year-round resident and local breeder in west Texas; nests in tall cliff eyries; migrant across state from more northern breeding areas in U.S. and Canada; winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant; stopovers at leading landscape edges, such as lake shores, coastlines, and barrier islands.	Potential foraging	Potential to occur, suitable habitat present. Suitable foraging habitat present.
Bald eagle	<i>Haliaeetus leucocephalus</i>	DL	T	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds.	Low potential	Unlikely to occur, suitable habitat does not exist. No nesting or foraging habitat present.

Appendix B

Species (Common) ¹	Species	Federal Status	State Status	Habitat Description	Habitat Present in Survey Areas (CDM Smith Desktop Assessment)	Habitat Present in Survey Area (Field Assessment)
Black-capped vireo	<i>Vireo atricapilla</i>	LE	E	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer.	Potentially present	Potential to occur, suitable habitat present. Suitable habitat present in juniper oak woodland habitat type.

Appendix B

Species (Common) ¹	Species	Federal Status	State Status	Habitat Description	Habitat Present in Survey Areas (CDM Smith Desktop Assessment)	Habitat Present in Survey Area (Field Assessment)
Golden-cheeked warbler	<i>Setophaga chrysoparia</i>	LE	E	Juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips only available from mature trees used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer.	Potentially present	Potential to occur, suitable habitat present. Suitable habitat is present within the Juniper Oak Woodland, Juniper Woodland, and Juniper Scrubland habitat types.
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T	Both subspecies migrate across the state from more northern breeding areas in U.S. and Canada to winter along coast and farther south; subspecies (<i>F. p. anatum</i>) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, <i>F.p. tundrius</i> is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	Potential foraging	Potential to occur, suitable habitat present. Suitable foraging habitat present.
Whooping crane	<i>Grus americana</i>	LE	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.	Unlikely	Unlikely to occur, suitable habitat does not exist.
Invertebrates						
Bone Cave harvestman	<i>Texella reyesi</i>	LE	None	Small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson counties; weakly differentiated from <i>Texella reddelli</i> .	Potentially present in suitable cave habitat	Potential to occur, suitable habitat present. Karst habitat present.

Appendix B

Species (Common) ¹	Species	Federal Status	State Status	Habitat Description	Habitat Present in Survey Areas (CDM Smith Desktop Assessment)	Habitat Present in Survey Area (Field Assessment)
Coffin Cave mold beetle	<i>Batrisodes texanus</i>	LE	None	Resident, small, cave-adapted beetle found in small Edwards limestone caves in Travis and Williamson counties.	Potentially present in suitable cave habitat	Potential to occur, suitable habitat present. Karst habitat present.
Tooth Cave ground beetle	<i>Rhadine persephone</i>	LE	None	Resident, small, cave-adapted beetle found in small Edwards limestone caves in Travis and Williamson counties.	Known to be present in caves within 500 feet of proposed work areas	Potential to occur, suitable habitat present. Karst habitat present.
Mollusks						
False spike mussel	<i>Quadrula mitchelli</i>	None	T	Possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel, and cobble; one study indicated water lilies were present at a site where the species was found; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins.	Unlikely	Unlikely to occur, suitable habitat does not exist. No surface waters present.
Smooth pimpleback	<i>Quadrula houstonensis</i>	C	T	Small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel; tolerates very slow to moderate flow rates; appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms; lower Trinity (questionable), Brazos, and Colorado River basins.	Unlikely	Unlikely to occur, suitable habitat does not exist. No surface waters present.
Texas fawnsfoot	<i>Truncilla macrodon</i>	C	T	Little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals; possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins.	Unlikely	Unlikely to occur, suitable habitat does not exist. No surface waters present.

Appendix B

Species (Common) ¹	Species	Federal Status	State Status	Habitat Description	Habitat Present in Survey Areas (CDM Smith Desktop Assessment)	Habitat Present in Survey Area (Field Assessment)
Reptiles						
Texas horned lizard	<i>Phrynosoma cornutum</i>	None	T	Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush, or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March through September.	Potential	Potential to occur, suitable habitat present. Suitable habitat present in the Live Oak Savannah, Juniper Scrubland, Mesquite Scrubland, and Maintained ROW habitat types.
Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>	None	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover,(<i>i.e.</i> , grapevines or palmetto).	Low potential	Potential to occur. Suitable habitat present.

Status Keys:

LE – Federally Listed Endangered

C – Federal Candidate for Listing, formerly Category 1 Candidate

DL – Federally Delisted

E, T – State Listed Endangered/Threatened

¹ Based on information provided at <http://www.tpwd.state.tx.us/gis/ris/es/SpeciesList.aspx?parm=Williamson>

Appendix B Table 3. Identified Karst or Cave Features

Karst or Cave Feature	General Characteristics	Surrounding Habitat Type
Karst 1	Three-foot diameter swale Potential karst entrance covered with leaf litter Surrounded by live oak saplings and prickly pear cactus Entrance not excavated following USFWS protocol Dark clay soil present at entrance	Live Oak Savannah
Karst 2	Three-foot wide depression Entrance covered with collapsed rock Surrounded by little bluestem and prickly pear cactus	Juniper Woodland
Karst 3 (Mushroom Cave)	Previously identified karst or cave feature Fifteen foot by twelve foot 'room' Three foot by three foot entrance	Mesquite Scrubland
Karst 4 (Nelson Ranch Karst Feature)	Previously identified karst or cave feature Three foot by five foot concrete-graded structure at entrance	Juniper Oak Woodland
Karst 5	Six foot by three foot opening Ashe juniper leaf litter and prickly pear cactus surrounding entrance	Juniper Oak Woodland
Karst 6	Four foot by four foot opening Unknown spider species abundant at cave entrance Abundant leaf litter; minimal groundcover	Juniper Oak Woodland
Karst 7	Four foot by four foot opening Unknown spider species abundant at cave entrance Abundant leaf litter; minimal groundcover	Juniper Oak Woodland
Karst 8	Six foot by four foot opening Large grate over entrance Ashe juniper and oak leaf litter surrounding entrance	Juniper Oak Woodland
Karst 9	Six foot by three foot potential karst feature Entrance blocked by limestone cobble Space groundcover	Juniper Woodland

Karst or Cave Feature	General Characteristics	Surrounding Habitat Type
Karst 10	Three foot by four foot opening Entrance covered by leaf litter and detritus	Juniper Oak Woodland
Karst 11	Three foot by four foot opening Opening appears to have been excavated Sediment deposits at entrance	Juniper Woodland
Karst 12 (Shady Shaft)	Previously identified karst or cave feature Presence of listed karst fauna based on existing information	Juniper Woodland
Karst 13 (Flesh and Blood)	Previously identified karst or cave feature Excavated entrance with grate cover Presence of listed karst fauna based on existing information	Juniper Scrubland
Karst 14 (Pearl Harbor Cave)	Potential additional entrance to a previously identified karst or cave feature Ashe juniper leaf litter surrounding entrance	Juniper Woodland
Karst 15	No access (restricted area) Assumed to be karst or cave feature based on land formation No entrance identified	Juniper Oak Woodland
Karst 16 (Buttercup Bone Cave)	Previously identified karst or cave feature Grate cover over entrance	Juniper Oak Woodland

Appendix C
Agency Coordination Letters

Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 6, 2012

Ms. Mary McCaffity
City of Cedar Park
450 Cypress Creek Rd.
Cedar Park, Texas 78613

Re: TCEQ Grant and Texas Review and Comment System (TRACS) #2012-288, City of Cedar Park, Williamson County – Discovery Well Cave Preserve, Buttercup Creek Cave Preserves, Rattling Horn Park, Ranch Trails Park

Dear Ms. McCaffity:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers following comments:

A review of the project for General Conformity impact in accordance with 40 CFR Part 93 indicates that the proposed action is located in the City of Cedar Park, Williamson County, which is currently unclassified or in attainment of the National Ambient Air Quality Standards for all six criteria air pollutants. Therefore, General Conformity does not apply.

Although any demolition, construction, rehabilitation or repair project will produce dust and particulate emissions, these actions should pose no significant impact upon air quality standards. Any and particulate emissions should be easily controlled by using standard dust mitigation techniques.

We do not anticipate significant long term environmental impacts from this project as long as construction and waste disposal activities associated with it are completed in accordance with applicable local, state, and federal environmental permits and regulations. We recommend that the applicant take necessary steps to insure that best management practices are utilized to control runoff from construction sites to prevent detrimental impact to surface and ground water.

Any debris or waste disposal should be at an appropriately authorized disposal facility.

Thank you for the opportunity to review this project. If you have any questions, please contact Ms. Janie Roman at (512) 239-0604 or Janie.roman@tceq.texas.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Harrison".

Jim Harrison, Director
Intergovernmental Relations Division



July 24, 2012



Mark Wolfe
State Historic Preservation Officer
P.O. Box 12276
Austin, TX 78711-2276

Mr. Wolfe:

Through a grant with the Federal Emergency Management Agency (FEMA), the City of Cedar Park plans to conduct hazardous fuels reduction activities proximate to at-risk residences located within the wildland urban interface. Fuel reduction activities including removing and reducing both light and heavy fuels, highly flammable vegetation, ladder fuels, and vertical clearance of tree branches will be completed at the edge of the following parks and cave preserves that meet property lines in the following areas:

- Discovery Well Cave Preserve, 15000 Anderson Mill Road – Figure 1
- Buttercup Creek Cave Preserves, Buttercup Creek Blvd./Lakeline Blvd. – Figure 1
- Rattling Horn Park, 1305 Rattling Horn Cove – Figure 1
- Ranch Trails Park, 3701 Ranch Trails – Figure 2

Our project will have no adverse effects on any cultural, environmental or historical aspects of the community.

According to the guidelines for this project, a Section 106 Review by the Texas Historical Commission is necessary for an environmental assessment. We are asking for a review from the Texas Historical Commission declaring the land as not being a historical site. Maps of the proposed project locations are included.

If you have any comments or questions please feel free to contact us:

1. Mary McCaffity – Cedar Park Grants Coordinator
Phone: (512) 401-5160 or email: mary.mccaffity@cedarparktexas.gov
2. James Mallinger – Cedar Park Assistant EMC
Phone: (512) 401-5224 or email: james.mallinger@cedarparktexas.gov

Respectfully,

Mary McCaffity
City of Cedar Park, Grants Coordinator





United States Department of the Interior

FISH AND WILDLIFE SERVICE

10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974



Mr. Kevin Jaynes
Regional Environmental Officer
FEMA Region 6
800 North Loop 288
Denton, TX 76209-3698

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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