APPENDICES

APPENDIX F

Agency Coordination

United States Department of the Interior

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JUN - 9 2017

In reply refer to:
02ETAU00-2016-F-0401

Mrs. Jodi Bechtel
Texas Department of Transportation
Environmental Affairs Division
125 East 11th Street
Austin, TX 78701-2483

RE: SH 211 from FM 1957 to FM 471
CSJ: 3544-03-002, 3544-05-001, 3544-04-002, 3544-06-001
Bexar and Medina Counties, Texas

Dear Mrs. Bechtel,

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO), based on our review of the Texas Department of Transportation's (TXDOT) proposed extension of State Highway (SH) 211 approximately 7.6 miles along the border of Bexar County and Medina County, Texas. In this document we evaluate the effects of the proposed action on three Bexar County karst invertebrates ; the endangered Bracken Bat Cave meshweaver (*Cicurina venii*), and the unnamed troglobitic beetles, *Rhadine exilis* and *Rhadine infernalis*, and their Critical Habitat pursuant to Section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). We received TXDOT's final Biological Assessment (BA) and request for formal consultation on August 9, 2015.

Section 7 of the Act requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy designated critical habitat of such species. As per the Memorandum of Understanding dated December 16, 2014 (23 U.S.C. 327) the Federal Highway Administration (FHWA) assigned responsibility for compliance with the National Environmental Policy Act (NEPA) and all federal resource agency consultations, including section 7 consultations, to TXDOT. Therefore, TXDOT is the Federal agency associated with this proposed project.

This BO is based on information provided in TXDOT's January 30, 2015, formal consultation request and final BA, information in NEPA documents for previous versions of the proposed project, field biological investigation reports, interagency meetings and discussions, service files and other

sources of information. A complete administrative record of this consultation is on file in the Austin Ecological Services Field Office (AUESFO).

TXDOT has determined this project "may affect, and is likely to adversely affect" *C. venii*, *R. exilis*, and *R. infernalis*. Critical habitat (CH) has been designated for these species, and a portion of the proposed project is in critical habitat unit (CHU) 26. TXDOT has determined the project would result in no effect to 10 other federally listed species and no impact to 5 candidate species.

Document Outline

Consultation History
I. Proposed Action
II. Status of the Species and Critical Habitat
III. Environmental Baseline
IV. Effects of the Action
V. Cumulative Effects
VI. Conclusions
Incidental Take Statement

Consultation History

November 21, 2012: Bexar County submitted to TXDOT a "Scope Review Document" that describes the timing of consultation responsibilities.

March 12, 2013: Site visit to the US 211 project area to confirm golden-cheeked warbler habitat assessment.

November 19, 2013: Bexar County, Service, FHWA, TXDOT and SH 211 EA team meet and agree on process for SH 211 roadway under Section 7, and the joint preserve agreement covering mitigation for both the road and adjacent Stevens Ranch development.

February 14, 2014: The Service and Pape-Dawson Engineers meet to discuss proposed preserve design.

November 16, 2014: The Service receives letter from TXDOT requesting to initiate formal consultation for SH 211.

January 30, 2015: TXDOT submits BA to Service.

March 5 , 2015: Service informally requests format changes and other revisions to the BA.

November 16, 2015: TXDOT submits revised BA to Service.

December 22, 2015: The Service provides comments to TXDOT on potential Karst Fauna Areas.

January 30, 2016:	TXDOT submits revised BA to Service.
February 25, 2016:	Service submits request for additional information.
March 31, 2016:	TXDOT submits revised BA with additional information to Service.
May 23, 2016:	The Service requests documentation from TXDOT that CPS is making a commitment to allow management of karst invertebrate habitat within the CPS easement.
May 31, 2016	CPS Energy provides a letter to the Service agreeing to allow TXDOT to conduct management and monitoring of karst invertebrate habitat within the CPS easement.
June 9, 2016:	Service provides comments on the revised BA.
June 14, 2016:	TXDOT provides revised proposed Karst Fauna Area documents to the Service.
July 5, 2016:	CPS Energy provides a letter to the Service committing to follow vegetation management outlined in their biological opinion issued by the Service for their Cagnon-Kendall transmission line.
August 9, 2016:	TXDOT submits an amendment of the BA to Service to address June 9 comments.
September 29, 2016:	Service reviews Karst Fauna Area documents and provides comments.
March 2, 2017:	Letter from the Service agreeing with the Karst Fauna Area concept for the Stevens Ranch and Northern Stevens Ranch preserves.

Biological Opinion

This transmits the Service's biological opinion for TXDOT under Section 7(a)(4) of the Act as per the Memorandum of Understanding dated December 16, 2014 (23 U.S.C. 327) for the proposed SH 211 extension project.

I. PROPOSED ACTION AND ACTION AREA

Proposed Action

TXDOT is proposing new roadway construction to connect existing sections of SH 211. The SH 211 extension will run 7.6-miles along the Bexar County and Medina County line from Farm to Market Road (FM) 1957 to FM 471 (Figure 1). The project includes construction of a typical pavement section including two 12-foot wide travel lanes with 8-foot shoulders and adjacent bar

ditches. Other project components include bridge structures at Potranca Creek and Medio Creek, and a subsurface pedestrian bridge located in the Legend Oaks subdivision. The subsurface pedestrian bridge will be tunneled underneath the proposed roadway, and will connect adjacent sidewalks to the east and west of road within the Legend Oaks Subdivision. The project will also include new construction of smaller drainage structures such as drainage pipes and box culverts where the proposed roadway meets existing roads. Storm water management for the project includes open ditches and cross-drainage culverts.

Specific project construction actions that would result in subsurface excavation and disturbance are:

- Subsurface milling and grading to provide an even surface for subsurface road fill layers
- Drilling geotechnical boreholes between 4 and 6 inches wide and up to 50 feet deep
- Drilling bridge support shafts between 24 and 36 inches wide and up to 52 feet deep
- Trackhoe, backhoe, trencher excavation, typically used to install wastewater and stormwater drainage systems
- Jack and bore, which is a type of trenchless horizontal subsurface excavation

The proposed road extension is in an undeveloped area. The initial site preparation will include clearing vegetation up to 150-foot wide within the Right of Way (ROW) by grubbing (shallow digging in soil and clearing of roots and stumps) to prepare the natural ground surface for either compaction in fill areas or excavation by milling in those areas where the roadway profile is below the natural grade. TXDOT's ROW does vary to widths greater than 150 feet, but this project will not require the clearing of vegetation past the typical 150-foot width for the length of the entire project. Geotechnical surveys will be conducted in order to assess the subsurface beneath the roadway, and to inform construction recommendations. These surveys will require excavation by drilling a total of 38 pavement borings and 6 bridge borings. Pavement borings are up to 10-foot deep or until bedrock is reached, while bridge borings are up to 50-foot deep. Four borings will occur in karst zone 1, 13 in karst zone 2, 23 in karst zone 3, and 4 in karst zone 5.

Potranca Creek Bridge will be a 240-foot long structure crossing Potranca Creek in karst zone 2. TXDOT originally planned the bridge to proceed through the center of the ROW, placing the bridge on two hilltops. This original plan made the bridge excessively high in elevation, so TXDOT changed the construction design and shifted the bridge to the eastern boundary of the ROW and off the hilltops. The shift in bridge alignment requires milling excavation up to 15 feet at the bridge's northern and southern approaches, which will allow for the bridge to sit lower in elevation and at a more even and constant grade with the roadway. Construction of Potranca Creek Bridge will also require drilling excavation of 14 total bridge support shafts. The bridge support shafts will be 36 inches wide and 25 feet deep. Excluding bridge support shafts, TXDOT originally proposed to limit milling excavation to less than 18 inches in karst zone 2, but needed to increase excavation due to the bridge alignment shift. In order to minimize impacts in karst zone 2 and Feature S-99 the proposed alignment was shifted 24 feet to the eastern edge of the ROW and to the outside edge of a hilltop in the action area. The cut within the proposed ROW was also narrowed to 100 feet and limited by placing a retaining wall at the western side of the ROW cut, 75 feet from the western ROW line. These adjustments to the proposed alignment in karst zone 2 near Feature S-99 minimized excavation by 31%

(18,773 cubic yards) and eliminated the need to excavate the top of the hill across the full width of the ROW.

Medio Creek Bridge will be a 260-foot long structure crossing Medio Creek in karst zone 3. The bridge will not require excavation at the approaches, but will require drilling excavation for bridge support shafts. This bridge will have a total of 14 bridge support shafts that are 36 inches wide and up to 52 feet deep.

The pedestrian subsurface bridge will be a 57-foot long subsurface walkway that proceeds underneath the proposed SH 211 roadway in karst zone 3 near the center of the project. The bridge will connect sidewalks adjacent to the east and west of SH 211 in the existing Legend Oaks Subdivision where SH 211 intersects with Tamaron Valley Road. The bridge will require horizontal Jack and Bore style excavation up to 5 feet deep for the length of the bridge. The bridge will also require drilling 10 bridge support shafts that are 24 inches wide and 22 feet deep.

The construction of the roadway will be modified from typical road construction methods to minimize subsurface disturbance activity within karst zone 1 and Critical Habitat Unit (CHU) 26. In karst zone 1, the roadway will be built with the addition of fill material over the surface rather than grading the ground surface to minimize subsurface construction activity and disturbance. This design eliminates the need to excavate into the existing natural surface of karst zone 1 and CHU 26. The pavement sections in karst zone 1 will be constructed on fill that is a minimum of three feet in thickness.

To prevent runoff from paved road sections from draining into CHU 26, the road will be designed to drain into grass-lined bar ditches and drain outside the boundaries of CHU 26. Bar ditches approximately 5 feet wide and 3 feet deep will carry runoff from the road south to Potranca Creek, and away from karst zone 1 and CHU 26. Stormwater runoff in the southern portion of karst zone 2 will drain into grass-lined bar ditches to existing water management systems located at FM 1957.

The SH 211 roadway will cross through two sections of karst zone 2; once just north of the southern terminus of the project and again near the central portion of the project. TXDOT originally proposed only 0 to 18 inches of milling excavation in karst zone 2, but required more after the shift of the Potranca Creek Bridge described above. This increased excavation in karst zone 2 will be localized to the northern and southern approaches of Potranca Creek Bridge. All other areas where the roadway proceeds through karst zone 2 will only require 0 to 18 inches of excavation as originally planned. The up to 15-foot excavation depth does not include the excavation required for the drilling of bridge support shafts for Potranca Creek Bridge within karst zone 2. Drilling excavation for the bridges is described above.

Roadway construction occurring in karst zone 3 will be on fill material over the existing natural ground. Where applicable in karst zone 3, this will raise the centerline pavement elevation above the existing natural ground, and will reduce the amount of excavation needed for the subsurface pedestrian bridge to 5 feet deep. Other excavation in karst zone 3 includes the

drilling of bridge support shafts for Medio Creek Bridge and the subsurface pedestrian bridge in the Legend Oaks Subdivision which are described above.

TXDOT has proposed to setup two conservation easements for the conservation and recovery of *R. infernalis* as a part of this project. One 40-acre conservation easement will be centered on Max and Robert's Caves within karst zone 1 and CHU 26. The other easement will consist of a 9-acre setback around Feature S-99. These features are occupied by *R. infernalis* while S-99 also contains an unidentified eyeless *Cicurina* sp. The 40-acre conservation easement will serve as a preserve and be managed in perpetuity for the conservation and recovery of Bexar County karst invertebrates through a legally binding agreement. The 9-acre setback will also be managed as stated above, but does not meet preserve criteria based of the Service's Karst Preserve Design Recommendations. Both conservation easements will be acquired through the Public Improvement District (PID) made up of SH 211 stakeholders with authorization from Bexar County to collect taxes. These taxes will fund the long-term management and monitoring activities associated with the 40-acre preserve and 9-acre setback. The PID will not manage the preserves directly, but will fund Bexar County via collected taxes to manage the preserves. Bexar County will be responsible for the management and monitoring of both properties either directly or through arrangements involving a third party. Both easements will be managed in accordance with the Karst Preserve Management Plan for the Stevens Ranch Preserves which was approved by the Service January 3, 2017 (Pape-Dawson Engineers, Inc. 2017).

City Public Service (CPS) has an existing transmission line easement (Cagnon-Kendal 345-kV transmission line easement) which falls within the proposed 40-acre preserve around Max and Robert's Caves. CPS has agreed in writing to allow TXDOT to conduct management and monitoring of karst habitat within the portion of overlapping easement. CPS has also agreed to manage the transmission line easement in accordance with their issued biological opinion, and to inform the service of any vegetation management needed to maintain the transmission line within the proposed 40-acre preserve. CPS believes its current management plan within the Cagnon-Kendall ROW is consistent with the Karst Preserve Management Plan for Stevens Ranch.

Conservation Measures

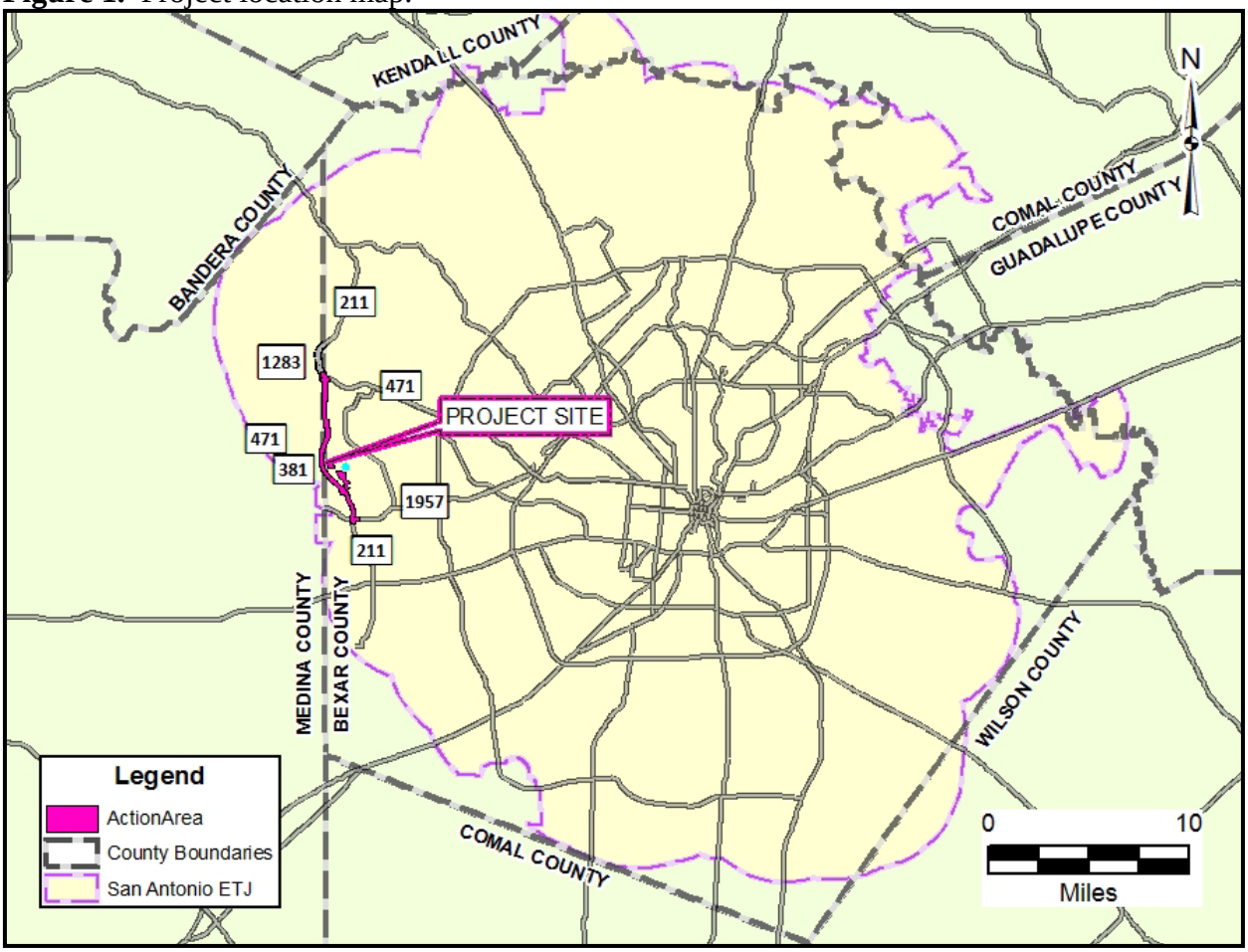
Impacts to *C. venii*, *R. exilis*, and *R. infernalis* will be minimized by reducing construction impacts in the proposed action area, described below. In addition, TXDOT has proposed the following conservation measures to avoid or minimize impacts to *C. venii*, *R.* exilis, *R. infernalis* and CHU 26.

The SH 211 project was designed to minimize excavation through karst zones 1-3 by avoiding excavation or by modifying excavation activities in order to minimize impacts to subsurface limestone and potential karst invertebrate habitat. Surveys of the proposed ROW were conducted in karst zones 1 and 2, and surveyors did not identify any new features occupied by federally listed species.

1. The proposed project alignment reduces the amount of ROW and construction required within karst terrain and remains within the budget of the pass-through agreement; thus, allowing for the

purchase of preserve which will contribute to a 40-acre Karst Fauna Area (KFA) and a 9-acre setback for endangered karst invertebrates.

Figure 1. Project location map.



2. The proposed project alignment will narrow the ROW from 400 feet to 150 feet wide. The alignment minimizes the length of the road through the karst zones, but will bisect CHU 26. Therefore, TXDOT will minimize effects to endangered species by avoiding excavation and drilling activities within KZ 1 and CHU 26; this will leave mesocavernous spaces intact. TXDOT will avoid and or minimize subsurface disturbance by adjusting the SH 211 roadway profile through the addition of fill material rather than grading the ground surface. Pavement sections constructed in KZ1 and CHU 26 will be constructed on fill material over surface a minimum of three feet thick. Drainage from the ROW will be carried in grass-lined bar ditches to a point outside critical habitat to prevent runoff from the paved road section from draining into critical habitat.

   To minimize the amount of excavation in karst zone 2 near Feature S-99 the alignment was shifted to the eastern edge of the ROW and the outside edge of the hilltops which will lessen the amount of vertical cut required during construction of the roadway. The ROW cut was also

narrowed by limiting the cut to only 100 feet wide and placing a retaining wall on the western side.

3. Approximately 49 total acres will be preserved in perpetuity as buffers to karst invertebrate features as part of this project. A 40-acre preserve around Max and Robert's Caves and a 9-acre setback around Feature S-99 will be placed under a conservation easement and preserved in perpetuity as conservation and mitigation measures for the SH 211 project. The 40-acre preserve includes the protection of 31 acres of CHU 26, and will minimize impacts to critical habitat within the proposed permanent preserve to protect the surface and subsurface Physical and Biological Features (PBF) of CHU 26. Potential impacts due to runoff from the road draining into critical habitat will be minimized by grass-lined drainage ditches designed to filter and drain runoff out of critical habitat to Potranca Creek.

   The conservation easements will be managed in perpetuity for the conservation and recovery of *R. infernalis* in accordance with the Karst Preserve Management Plan for the Stevens Ranch Preserves. The PID will be responsible for funding management and monitoring activities for the easements. Bexar County will utilize said funds to manage the easements directly or through a designated third party.

4. City Public Service has an existing transmission tower in the vicinity of Max and Robert's Cave within the proposed 40-acre preserve. However, the 40-acre preserve will not include any new utilities, infrastructure, or ponds with the potential to contaminate the cave. City Public Service has agreed to manage their existing transmission line easement within the 40 acre preserve in accordance with the conservation measures of their original biological opinion. Management of the caves would be ensured in perpetuity by a legally binding mechanism and has been designed to protect the caves from prohibited uses within the boundaries.

5. TXDOT will not utilize pesticides or herbicides during ROW vegetation management activities within critical habitat or in ROW adjacent to preserves or setbacks. TXDOT will manage RIFA within the TXDOT ROW adjacent to preserves, setbacks, and within critical habitat with practices identified in the Service approved Karst Preserve Management Plan for the Stevens Ranch Preserves.

6. If karst voids, any subsurface hole or mesocavernous space occurring in bedrock or limestone, are encountered during construction, all work would stop within 50 feet of the site and a qualified karst scientist will perform an initial geologic assessment. The work-stop buffer distance may be greater if the karst scientist deems appropriate. If an encountered void is determined to be potential karst invertebrate habitat, a scientist holding a Service issued 10(a)(1)(A) scientific collecting permit will inspect the void to determine if the feature contains habitat for karst invertebrates. If the void is determined to contain habitat for karst invertebrates, the feature would be inspected to determine its scientific or conservation value. TXDOT will avoid additional impacts to the maximum extent practicable should *C. venii*, *R. exilis*, or *R. infernalis* be present in any uncovered feature. The surface expression of the void will be covered between the time the void is opened and the time that a karst scientist is available to

inspect the expression in order to minimize the influence of diurnal variations in surface temperature and to retain moisture. The void will then be sealed per Texas Commission on Environmental Quality (TCEQ) approved methods. If any other endangered species are encountered that have not been considered with this project, TXDOT must halt construction and immediately reinitiate consultation. Hazard fencing or barricades will be used to protect the area if there is a fall hazard, such as the case of an open shaft. Appropriate best management practices (BMP), including the installation of silt fencing and/or silt socks and immediate area work stoppage, would be implemented to minimize surface runoff from entering the feature.

7. Project Specific Locations (PSLs), including construction access and staging, would be located within the project area and proposed ROW to the maximum extent practicable. Details on the locations of the PSLs will not be available until the project design is finalized and a construction contractor is chosen. However, all PSLs will be located at least 300 feet from any potential listed species habitat unless it has been surveyed in accordance with Service protocols to determine that the habitat is not occupied.

   Environmental compliance for PSLs located outside of TXDOT's ROW would be the responsibility of the project contractor. TXDOT will provide an information packet to the project contractor, including information on the karst species that may occur within the ROW or outside of the ROW but within the action area, their habitat requirements, as well as information on the protection of CHU 26. TXDOT will also notify the contractor of requirements under the Act to avoid effects to listed species and their habitat.

8. TXDOT must hold a pre-construction meeting with its employees and contractors working on this project. TXDOT must provide specific instruction on the implementation of TXDOT's proposed Conservation Measures and the Service's Reasonable and Prudent Measures, included in the Incidental Take Statement. Instructions specific to the contractor(s) related to implementation of TXDOT's proposed Conservation Measures and the Reasonable and Prudent Measures described herein must be documented in writing. TXDOT is ultimately responsible for informing anyone working on this project of these requirements. In addition, TXDOT must provide information and training to all employees and contractors working on the project of the measures proposed to avoid impacts to karst invertebrate habitat.

9. The project would include five or more acres of earth disturbance and an increase in impervious cover; therefore, TXDOT must comply with the TCEQ Texas Pollutant Discharge Elimination System Construction General Permit. A Storm Water Pollution Prevention Plan has been developed to address temporary and permanent BMPs to minimize construction phase erosion and sedimentation impacts. The BMPs will be incorporated into the proposed project and related notes and diagrams included in required TCEQ permitting documents and construction plans. The Stormwater Pollution Prevention Plan will be implemented prior to initial site disturbance, and a construction site notice will be posted on the construction site. Grass-lined ditches will filter stormwater runoff for the full length of the project.

10. TXDOT will revegetate disturbed areas utilizing standard practices for urban areas and the TCEQ construction general permit. The following restoration actions will be implemented in areas to be revegetated:

    - To the extent practicable, topsoil suitable for maintaining native vegetation will be added in areas that will be revegetated. The topsoil will filter runoff and provide a layer of protection to stabilize subsurface temperatures and prevent moisture loss.
    - Native seeding and plantings will be used to reestablish vegetative communities which will provide some filtration of water and also insulate the karst system from excessive drying and from extreme subsurface temperature fluctuations (USFWS 2011).

11. TXDOT will restore disturbed soil by installing measures to help prevent future erosion during the final stages of construction. Best management practices will be implemented by seeding the ROW with TXDOT standard seed mix, and grass will filter runoff in several locations. Soil retention blankets and gabion mattresses will be installed to prevent erosion in the channels.

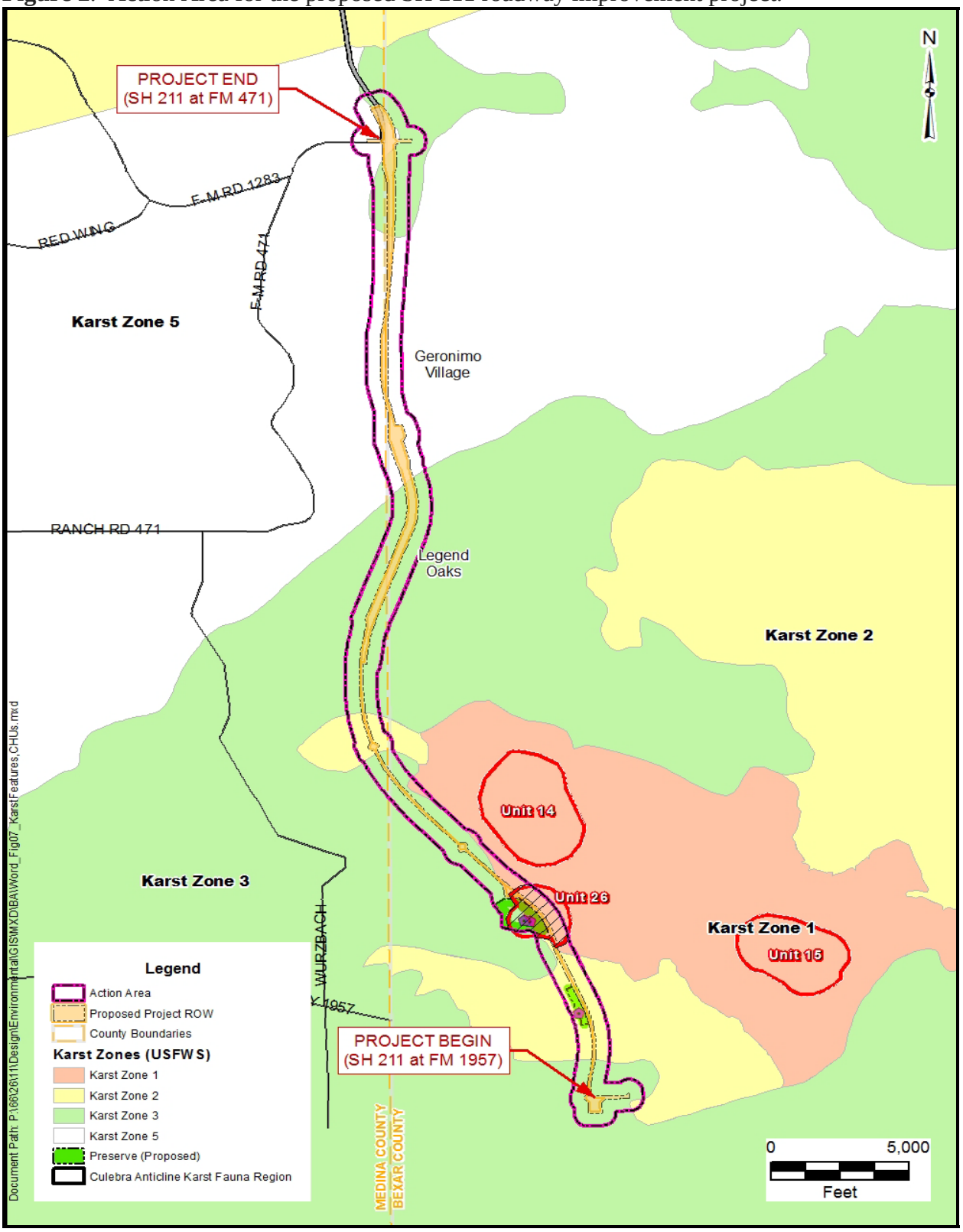
12. During borehole activities for bridge piers, voids in bedrock are usually indicated by a bit drop. If a bit drops more than 1 foot while advancing a borehole, the geotechnical operator will cease operation, and the borehole will be inspected for karst voids using a downhole camera. If the borehole contains no voids, or voids that do not meet potential habitat criteria, then work at that feature will continue. If the borehole contains voids that meet the criteria for potential karst invertebrate habitat, surveys in accordance with current Service protocols will ensue.

13. TXDOT will prepare monthly project reports to document the number, location, and depth of voids encountered during construction. TXDOT will prepare a summary of results for any karst invertebrate surveys conducted, any observations made with a down-hole camera, the work actions completed during the reporting period, and the construction actions that are anticipated to be implemented in the next reporting period. During construction, these reports will be provided to the Service semi-annually, in January and June, with a final construction report submitted six months after construction is completed or when the contractor has been released from the contract. TXDOT will continue quarterly site monitoring for a period of one year after construction is complete to evaluate the results of post construction restoration efforts. TXDOT will provide a single report to the Service at the conclusion of this monitoring.

Action Area

TXDOT's BA refers to both a project area and an action area. This BO relies on the BA's description of the project area and action area to define the limits of the proposed action on all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action. The project area is located in the City of San Antonio's Extraterritorial Jurisdiction along the Bexar and Medina county line (Figure 2), and partially falls within the Culebra Anticline KFR in the Austin Chalk and Pecan Gap geologic units. The project area spans karst zones 1, 2, 3, and 5, and extends 7.6-miles along the border of Bexar County and Medina County, Texas from FM 1957 to

Figure 2. Action Area for the proposed SH 211 roadway improvement project.



FM 471and includes the proposed ROW. The action area includes the project area and a 500-foot buffer for the length of the proposed roadway occurring is karst zones 1-3. Karst zone 5 is not included in the proposed project as contributing to the action area. Karst zone 5 does not contain endangered karst invertebrates, and it does not meet their habitat requirements. The proposed actions in karst zone 5 are unlikely to directly or indirectly harm endangered karst invertebrates in this project. The limits of the action area total 983 acres. The 500-foot buffer is included in the action area to capture the potential for construction effects to extend beyond the limits of the project footprint and potentially affect vegetation, surface, or subsurface drainage associated with karst invertebrate habitat. The Service agrees with the extent of the action area as proposed by TXDOT.

II. STATUS OF THE SPECIES AND CRITICAL HABITAT

Species Description

Nine Bexar County karst invertebrates were federally listed as endangered species on December 26, 2000 (65 CFR 81419). The nine species listed were *R. exilis*, *R. infernalis*, *C. madla*, the Bracken Bat Cave meshweaver (*C. venii*), the Government Canyon Bat Cave spider (*C. vespera*), the Robber Baron Cave meshweaver (*C. baronia*), the Cokendolpher Cave harvestman (*Texella cokendolpheri*), the Government Canyon Cave spider (*Neoleptoneta microps*), and the Helotes mold beetle (*Batrisodes venyivi*).

R. exilis is a small, slender-bodied, troglobitic ground beetle with rudimentary eyes. *R. exilis* was first collected in 1959 and described as *Agonum exile*, but later assigned to the genus *Rhadine* (Barr 1974). *R. exilis* is known from at least 54 karst features located in five of the six Bexar County KFRs and 15 CHUs. In the Culebra Anticline KFR, *R. exilis* is known to occur in one location approximately 4 miles northeast of the proposed project area where Edwards Limestone transitions into Austin Chalk.

R. infernalis is a small, robust, reddish-brown beetle with minute eye rudiments and a narrow neck, with a total body length which averages about 7.2 millimeters. *R. infernalis* is known from at least 59 karst features located in five of the six Bexar County KFRs and 20 CHUs, including all four CHUs in the Culebra Anticline KFR. The closest confirmed location of this species is in CHU 26, and Feature S-99 on the western edge of the proposed SH 211 project.

C. venii is a small eyeless spider with reduced pigment. The species is known from only two caves in the Culebra Anticline KFR. *C. venii* was originally found in Bracken Bat Cave, which is located about two miles west of the action area. The area around Bracken Bat Cave is designated as CHU 15. The CHU contains 11 known caves, with several caves that are occupied by *R. infernalis*. In 2012, TXDOT discovered a new location (Feature 151-Z09) for *C. venii* during construction at the Loop 1604/SH 151 interchange.

Critical Habitat Description

Critical habitat includes areas that are essential to the conservation of a threatened or endangered species and that may require special management considerations or protection. Critical habitat for

seven of the nine endangered Bexar County karst invertebrates was designated in 22 CHUs, covering about 1,063 acres, on April 8, 2003 (68 CFR 17155). Critical habitat was revised on February 14, 2012 for these species (77 CFR 8450). The revised critical habitat designation included approximately 4,216 acres, occurring in 30 separate CHUs within Bexar County. Critical habitat was not designated on a per species bases, and includes potential habitat for all species based on the presence of the physical and biological features needed by endangered Bexar County karst invertebrates. Based on our current knowledge of the physical and biological features and habitat characteristics required to sustain the species' life- history processes specific to each of the nine Bexar County invertebrates are:

(1) Karst-forming rock containing subterranean spaces (caves and connected mesocaverns) with stable temperatures, high humidity (near saturation), and suitable substrates (for example, spaces between and underneath rocks for foraging and sheltering) that are free of contaminants; and,

(2) Surface and subsurface sources (such as plants and their roots, fruits, and leaves, and animal (e.g., cave cricket) eggs, feces, and carcasses) that provide nutrient input into the karst ecosystem.

Activities that may alter critical habitat PBFs include:

(1) Action that would result in removing, thinning, or destroying perennial surface vegetation.

(2) Actions that would alter the surface topography or subsurface geology, resulting in a disruption of ecosystem processes necessary to sustain the karst environment.

(3) Actions that would introduce pollutants to the occupied features themselves, the surface and subsurface drainage basins, or the surrounding mesocaverns.

(4) Activities within caves that would lead to soil compaction, changes in atmospheric conditions, or abandonment of the cave by bats or other fauna.

(5) Activities that would attract or increase fire ants, cockroaches, or other invasive predators, competitors, parasites, or potential vectors for diseases into caves or karst features within the critical habitat units.

Life History

Due to the cryptic nature of endangered karst invertebrates, there is little specific information regarding their life history. All endangered karst invertebrates are obligate cave species known as troglobites (animals that complete their life cycle underground and exhibit adaptation to the subsurface environment). These species are characterized by reduced or absent eyes, lack of pigmentation, elongation of sensory appendages, and low metabolic rates. Compared to surface species, troglobitic species generally have small geographic ranges and specific limitations to a particular geographic area, often related to the sub-surface geology, making them biogeographically

distinct (Porter 2007, Christman et al. 2005) and particularly susceptible to extinction (Elliott and Reddell 1989, Culver et al. 2000).

C. venii, *R. exilis*, and *R. infernalis* require underground caves and passages with stable temperatures (Howarth 1983, Dunlap 1995) and constant, high humidity (Barr 1968, Mitchell 1971a). In addition to the larger cave passages that are accessible by humans where individuals are normally collected, these species also need mesocaverns (tiny voids that are connected to larger cave passages) (Howarth 1983), which provide additional habitat to sustain viable populations (White 2006). In order to support karst invertebrates, mesocavernous spaces should be a minimum width of 0.2 to 0.4 inch, which also corresponds to the threshold of turbulent groundwater flow that could potentially carry nutrients to karst species (Howarth 1983, Veni 1994). During temperature extremes, small mesocavernous spaces connected to caves may have more favorable humidity and temperature levels than the main cave (Howarth 1983); however, the abundance of food may be less in mesocaverns than in the larger cave passages. Therefore, the endangered Bexar County Karst invertebrates may spend the majority of their time in mesocaverns, only leaving during temporary forays into the larger cave passages to forage (Howarth 1987).

Physical factors in caves that affect the life history of endangered karst invertebrate species include absence of sunlight, low nutrient flow, and a stable environment with uniform temperature and humidity. These parameters favor the evolution of troglomorphic characteristics including reduction or loss of eyes, reduced pigmentation, and attenuated limbs and olfactory organs (USFWS 2011). Additionally, nearly all cave-adapted organisms exhibit the following characteristics: delayed reproduction, larger eggs, relatively small number of total eggs produced, and increased longevity (Culver 1982). Although the average life span of any of the listed troglobitic invertebrates is currently unknown (USFWS 2011), it is likely to be multiple years for some species, such as the eyeless *Cicurina* sp. (Bennett 1985, Cokendolpher 2004).

C. venii, *R. exilis*, and *R. infernalis* need clean water that is free of pollutants to maintain stable humidity and temperatures. To maintain stable humidity, the amount of clean water varies depending on the size of the drainage basins, caves, and mesocaverns. Water enters the karst ecosystem through surface and subsurface drainage basins. Well-developed pathways, such as cave openings and fractures, rapidly transport water through the karst with little or no purification. Caves are susceptible to pollution from contaminated water entering the ground because karst has little capacity for self-purification. The potential for pollutants, such as pesticides, fertilizers, and leakage from sewer lines, may be heightened in some karst areas relative to others based on local geologic features (USFWS 1994).

Surface and sub-surface drainage basins have the greatest potential to route and carry water-borne contaminants into the karst ecosystem. Because cave fauna require material washed in through entrances (including humanly inaccessible cracks), and because they require generally high humidity, it is essential to have drainage basins with unpolluted water. The surface drainage basin consists of the area that drains from the surface into the cave entrance and other surface input sources, such as neighboring sinkholes and soil percolation. The subsurface or groundwater drainage basin includes mesocaverns, as well as subterranean streams that have a connection to the surface, but that connection is often not observable from the surface. The surface and subsurface

drainage basins do not necessarily overlap, and they may be of different size and direction (Veni 2003).

Due to the absence of sunlight cave organisms rely almost entirely upon surface plant and animal communities for nutrient input. Surface plant communities provide nutrients through leaf litter that enters caves or karst voids and from root masses that may grow directly into caves (Howarth 1983). In caves that do not have an opening at the surface, nutrients probably enter via dissolved organic carbon in droplets of water that pass through very small cracks, root paths, bedding planes, or other very small voids, and the nutrients then enter the cave as drips (Simon et al. 2007). Tiny arthropods, such as springtails, may also feed in the near-to-surface plant-rich soil zone and travel through these passages, ultimately becoming a food source for spiders and other predators. Primary sources of nutrients in the karst ecosystem are leaf litter, cave crickets, small mammals, and other animals that defecate or die in the cave. Because endangered karst invertebrates are at the top of their food chain, habitat changes that affect their food sources (including plants and cave crickets) may affect them as well (Culver *et al*. 2000).

Cave crickets are an important source of nutrient input for karst ecosystems (Barr 1968, Reddell 1993). The cave crickets forage on the surface at night and roost in the cave during the day. Cave crickets provide food for karst species, which feed on their eggs, young, and feces (Mitchell 1971b, Barr 1968, Poulson *et al*. 1995). Many of the vertebrate species that occasionally use caves bring in a significant amount of energy in the form of scat, nesting material, and carcasses.

The surface plant community supports the karst ecosystem function both directly and indirectly. Dead and decaying plant material can fall or be washed into caves. Root masses reaching cave openings through soil and rock fissures may also provide direct nutrient input to shallow caves (Howarth 1983, 1988). A survey of 21 caves on the Edwards Plateau revealed that roots of six species reached caves (Jackson *et al.* l999). Indirectly, the plant community supports cave ecosystem dynamics by providing the habitat matrix used by surface animal communities that contribute nutrient input to the karst ecosystem, including habitat needed for food, forage, and shelter by mammals, invertebrates, amphibians, and reptiles. In addition to providing nutrient input, the surface plant community buffers the karst ecosystem from changes in the temperature and moisture regimes, and sedimentation from soil erosion. It also serves to filter pollutants (to a limited degree) before they enter the karst system and protects against nonnative species invasions (Biological Advisory Team 1990, Veni 1988).

Population Dynamics

Population estimates *C. venii*, *R. exilis*, and *R. infernalis* are currently not available due to their rarity, cryptic behavior, lack of adequate sampling techniques, difficulty and/or inaccessibility of karst habitat, including mesocavernous spaces. Subterranean habitat can be undetectable from the surface when now surface expressions are visible to researchers. Generally, no more than one or two individuals are seen on a visit into a cave and often none are observed, even in karst features where they are considered relatively abundant (USFWS 1994).

Krejca and Weckerly (2007) assessed the detection probabilities of three karst invertebrates, including *R. exilis,* during karst faunal surveys. The results of their study suggest that 10 to 22 visits may be required in order to confirm presence for various karst species. For example, while surveying one feature associated with the SH 151 underpass of Loop 1604, an eyeless *Cicurina* spider was not found until the 12th survey, indicating that in this case 12 visits was enough to detect the species, but 11 was not (TXDOT 2013). Furthermore, central Texas endangered karst invertebrates have been found in caves that immediately prior to sampling had no humanly accessible entrances (Horizon Environmental Services 1991, Veni 2003, TXDOT 2013).

Status and Distribution of *C. venii, R. exilis,* and *R. Infernalis*

Summarized Reasons for Listing Nine Bexar County Karst Invertebrates

(1) *The present or threatened destruction, modification, or curtailment of their habitat or range.*

The ranges of Bexar County Karst invertebrates are limited to limestone karst strata in the northern portion of Bexar County, which includes portions of northern San Antonio, Texas. Their historic ranges are unknown, but were likely similar to their present day ranges with the exception of caves that have been destroyed or severely impacted. The proximity of the caves and karst features inhabited by these species to the City of San Antonio makes them vulnerable to negative impacts as a result of continuing expansion of the San Antonio metropolitan area.

(2) *Overutilization for commercial, recreational, scientific, or educational purposes.*

These species are of little interest in the insect trade or to amateur collectors. They are collected only occasionally by scientists conducting studies of cave fauna. While it is true that positive identification of karst invertebrates usually requires collection and permanent preservation of individual specimens, the number of individuals taken for this purpose is small, and such collections are made infrequently. We do not believe that collection of a few individuals has significantly reduced their numbers

(3) *Disease or predation.*

Human activities facilitate movement of certain predators, such as fire ants, into an area. Construction areas, lawns, roadways, and landscaped areas provide habitat from which these species can disperse. The relative accessibility of the shallow caves in Bexar County leaves endangered karst invertebrates especially vulnerable to invasion by nonnative species. There is evidence that overall arthropod diversity drops in their presence (Vinson and Sorese 1986, Porter and Savignano 1990).

(4) *The inadequacy of existing regulatory mechanisms*.

Endangered karst invertebrates, and their habitat, are not provided protection by the State of Texas. At the time of listing, no specific regulations provided for the protection of karst invertebrates or karst features that serve as habitat for these endangered invertebrate species.

(5) *Other natural or manmade factors affecting their continued existence.*

Human activity may facilitate the movement and increase of native and nonnative species. These species may compete with karst invertebrates by consuming the same foods and using the same habitats, or they may compete indirectly by using resources needed by species such as cave crickets that provide nutrient input to karst ecosystems. Fire ants can be considered both predators and competitors. Human recreation activities and vandalism may disturb habitat by compaction of soil, changes in atmospheric conditions, abandonment of the cave by animals contributing to nutrient input to the cave ecosystem, and direct mortality of karst fauna. The introduction of trash and excess nutrients may also facilitate the establishment of competing native and nonnative species.

Rangewide Trend

Sufficient survey data does not exist to thoroughly determine the population trends for *C. venii*, *R. exilis*, and *R. infernalis*. The cryptic nature, lack of access, and difficulty in surveying habitat for karst species presents data collection challenges. Given these challenges, this BO discusses the "Rangewide Trend" concept in relation to species progressing or retreating to/from recovery criterion discussed below. This BO relies on the recovery criterion listed in the Bexar County Karst Invertebrate Recovery Plan (USFWS 2011).

Description of Habitat and Delineation

The northern portion of Bexar County is located on the Edwards Plateau, a broad and flat expanse of Cretaceous carbonate rock that ranges in elevation from approximately 1,100 feet to 1,900 feet above mean sea level. The principal cave-containing rock units of the Edwards Plateau are the upper Glen Rose, Edwards Limestone, Austin Chalk, and Pecan Gap Chalk formations. One-third of the cavernous rock exposed at the surface in Bexar County is of the Edwards Limestone formation (Veni 1988, Veni 1994).

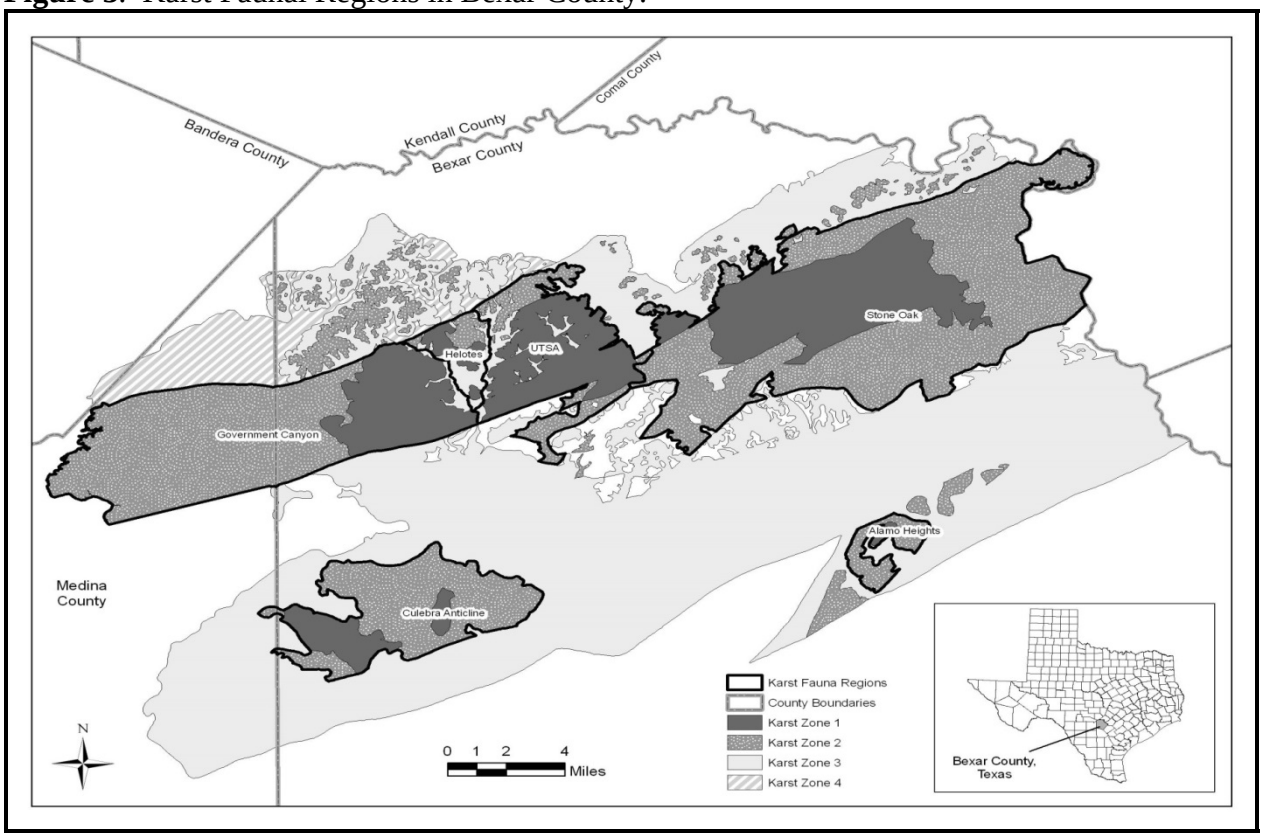
Veni (1994) delineated six Karst Faunal Regions (KFRs) within Bexar County: Stone Oak, University of Texas at San Antonio, Helotes, Government Canyon, Culebra Anticline, and Alamo Heights (Figure 3). These KFRs are bounded by geological or geographical features that may represent obstructions to the movement (on a geologic timescale) of troglobites, which has resulted in the present-day distribution of endemic (restricted to a given region) karst invertebrates in the Bexar County area. The basis for these regions is the lack of continuity between caves, which may form complete barriers or significant restrictions to migration of troglobites over modern or geologic timescales. The KFRs are important because they are used to establish recovery criteria for individual species in the Bexar County Karst Invertebrate Recovery Plan (USFWS 2011). To meet those criteria, specified numbers of preserve areas of a given quality must be protected within each KFR in which they occur.

Veni (2003) also delineated Bexar County karst habitat into five "karst zones" (Figure 4) that reflect the likelihood of finding a karst feature that would provide habitat for the endangered invertebrates, based on geology, distribution of known caves, distribution of cave fauna, and the primary factors that determine the presence, size, shape, and extent of caves with respect to cave development. As

described by Veni (2003), these five karst zones are defined as:

Zone 1: Areas known to contain one or more of the nine listed Bexar County karst invertebrates.
Zone 2: Areas with a high probability of containing habitat suitable for listed karst invertebrate species.
Zone 3: Areas that probably do not contain karst invertebrates (may not contain suitable karst habitat).
Zone 4: Areas that require further research, but are generally equivalent to Zone 3, although they may include sections that could be classified as Zone 2 or 5.
Zone 5: Areas that do not contain listed karst invertebrates (no karst habitat present).

Figure 3. Karst Faunal Regions in Bexar County.

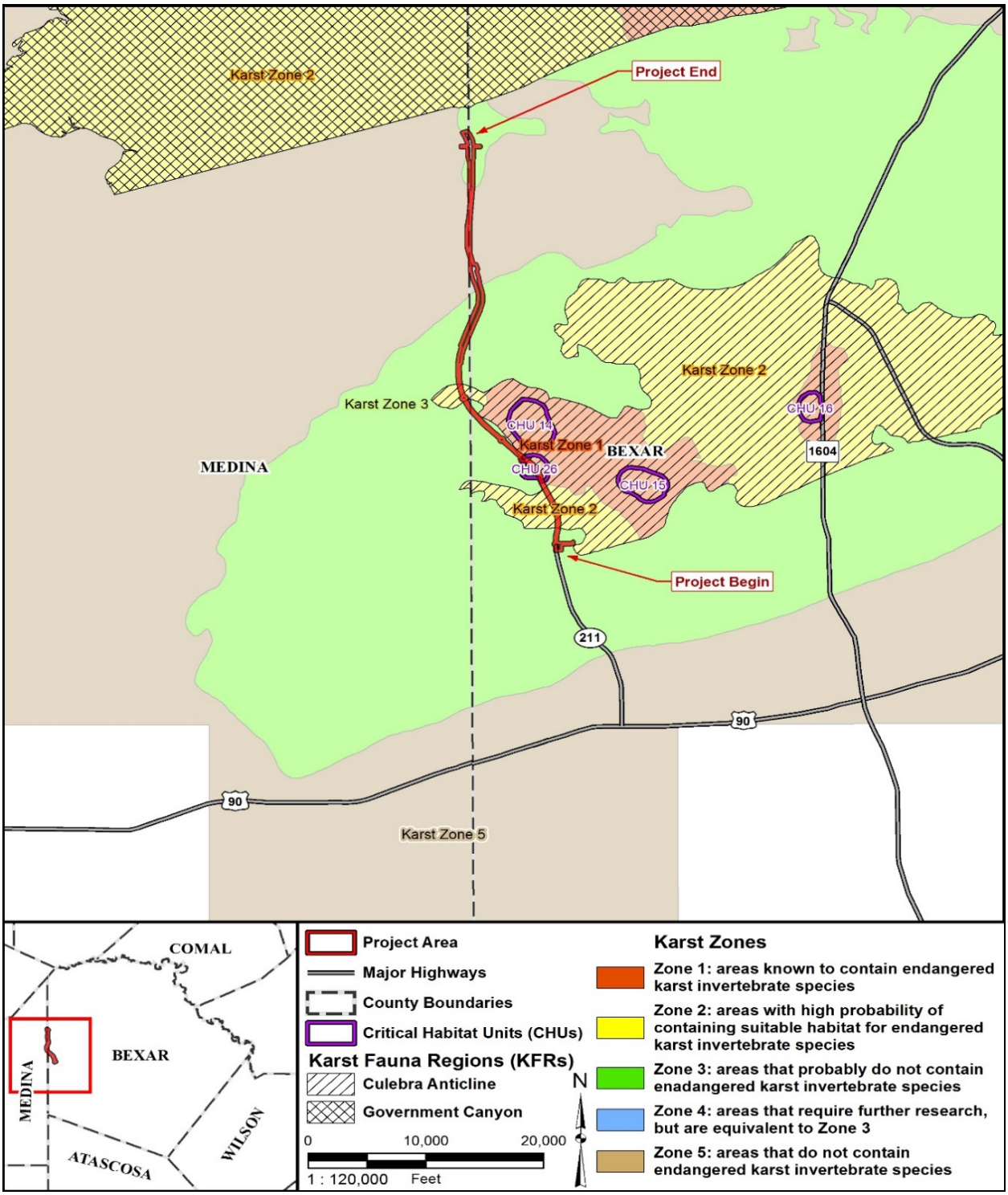


Recovery Criteria

The recovery strategy is to reduce threats to the species by protecting an adequate number of karst areas to ensure a high probability of the species' long-term survival. Recovery Criteria are as follows:

Criterion 1 – (downlisting) – The location and configuration of at least the minimum quality and number of KFAs in each KFR for each species are preserved. Also, legally binding commitments are in place for perpetual protection and management of these KFAs.

Figure 4. Karst Faunal Regions and karst zones in the project area.



Criterion 2 – (delisting) – In addition to the downlisting criterion, monitoring and research have been completed to conclude with a high degree of certainty that KFA sizes, quality, configurations, and management are adequate to provide a high probability of the species survival (greater than 90 percent over 100 years). To assess adequacy, results should be measured over a long enough time that cause and effect can be inferred with a high degree of certainty.

For the purposes of recovery, a Karst Fauna Area (KFA) is an area known to support one or more locations of a listed species. A KFA is distinct in that it acts as a system that is separated from other KFAs by geologic and hydrologic features or processes that create barriers to the movement of water, contaminants, and troglobitic fauna. Karst fauna areas should be far enough apart so that if a catastrophic event (for example, contamination of the water supply, flooding, disease) were to destroy one of the areas, that event would not likely destroy any other area occupied by that species. There are three categories of KFAs, high, medium, and low. All preserved KFAs should be either medium or high quality as defined in the Service's karst preserve recommendations. Based on the distribution of the *Rhadine* species within five KFRs, each of these species needs three KFAs in each KFR composed of at least one high quality and two medium quality KFAs. Given *C. venii's* current known distribution exclusively to the Culebra Anticline KFR, the species would require a minimum of six protected KFAs within the single KFR. Because these species can be co-located, the total number of KFAs across all KFRs could vary.

Based on a desktop review of known locations, Table 1 displays the past and current potential for these three species to meet the necessary KFAs for recovery. Note that this includes caves both in and not in designated critical habitat units.

Table 1. Number of past (2011 Five Year Review) and presently known potential high and medium quality caves for *R. exilis*, *R. infernalis*, and *C. venii*.

Species	KFR	Past Potential High	Current Potential High	Past Potential Med	Current Potential Med	# of KFAs Needed
R. exilis	Culebra	Unk[1]	0	Unk[1]	2	15
	G. Canyon	3	4	0	0	
	Helotes	1	1	1	2	
	Stone Oak	1	2	0	0	
	UTSA	3	3	0	3	
R. infernalis	Culebra	0	6	0	2	15
	G. Canyon	5	8	0	0	
	Helotes	2	2	1	1	
	Stone Oak	0	1	0	0	
	UTSA	2	4	0	1	
C. venii	Culebra	0	0	0	0	6

[1] Locations were unknown prior to 2011 five year review

Based on this analysis, additional locations of *R. infernalis* would need to be discovered and preserved to meet the downlisting requirements in the Stone Oak KFR. For *R. exilis*, additional locations would need to be discovered and preserved in the Helotes, Stone Oak, and Culebra KFRs. For *C. venii*, additional locations would need to be discovered and preserved in the Culebra KFR. This table top analysis indicates a general increase in potential KFAs necessary to meet recovery criteria for the *Rhadine* species, but is still lacking in certain KFRs. Potential KFAs in the Culebra KFR for *C. venii* have not yet been discovered, and requires further survey efforts.

According to our consultations database, there have been three formal consultations on *R. infernalis* and one on *R. exilis*. One *R. infernalis* consultation covered the potential for take; however, it was not known to occur in the action area. The other two consultations for *R. infernalis* and the single *R. exilis* consultation covered impacts that were occurring within the surface area near already heavily impacted cave entrances, but did not directly affect the caves.
Additionally, the Service has completed two formal consultations on 10(a)(1)(B) incidental take permits covering both *Rhadine* species (La Cantera HCP and SEP HCP). Both cover direct impacts to caves with *R. exilis*; however, only the SEP HCP covered direct effects on *R. infernalis*. The La Cantera consultation covered the potential for *R. infernalis* to be indirectly impacted due to its location within the KFR. Conservation measures that resulted from all five consultations include *Rhadine* biota studies, four *R. exilis* preserves, six *R. infernalis* preserves, and the potential for several more medium and high quality KFAs for both species as implementation of the SEP HCP proceeds.

Two formal consultations exist for *C. venii*, both of which covered the potential for take. The first consultation resulted in unauthorized take of *C. venii*, during preconstruction grading activities for the SH 151/Loop 1604 interchange project in Bexar County; this project was previously the subject of informal consultation which required monitoring and surveying of karst features uncovered during construction. During this project *C. venii* was discovered in one of six karst features containing eyeless *Cicurina* sp. As a result of the number of features being uncovered, TXDOT redesigned the plan to include an overpass in order to minimize any further impacts to endangered karst species. The second formal consultation involved the Loop 1604 improvement project between SH 151 and Caracol Creek in Bexar County. During surveys for the aforementioned project several karst features were found within the project survey area but only one contained immature eyeless *Cicurina* sp. Although *C. venii* was not known to occur in the project area, the proximity of the project to the only two known locations for *C. venii* (Bracken bat cave, and the recently discovered 151-019 feature) TXDOT could not discount the possibility the eyeless *Cicurina* sp. were *C. venii*. TXDOT included conservation measures to minimize impacts to this feature. It is unknown if take occurred.

Status and Distribution of Critical habitat

<u>Reason for Designation of Critical Habitat</u>

The December 26, 2000, final listing rule details the Service's finding that critical habitat designation for endangered Bexar County karst invertebrates was prudent due to benefits it would provide to the species (65 CFR 81419). The benefits include special management considerations, focused conservation activities by identifying areas that contain the PBFs essential for the conservation of the species, alerting the public and land managing agencies to the importance of

these areas, and protection from destruction or adverse modification through required Section 7 consultation.

Rangewide Trend

This BO relies on the February 11, 2016 final rule for the definition of "Destruction or Adverse Modification" which means "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation for listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (50 CFR 7214). For a detailed description of critical habitat designated for endangered Bexar County karst invertebrates see the revised February 14, 2012 ruling (77 CFR 8450). The revised critical habitat designation included approximately 4,216 acres, occurring in 30 separate CHUs within Bexar County.

A review of existing information regarding endangered Bexar County karst invertebrates documented four CHUs had formal Section 7 consultations and include CHUs 9, 12, 13, and 16. Of these units, unit 12 had two formal section 7 consultations for a total of five formal section 7 consultations altogether. Table 2 depicts consultation history of critical habitat for the endangered Bexar County karst invertebrates. It is important to note that many CHUs had varying levels of preexisting modifications (i.e. roads, buildings, neighborhoods, etc.) at the time of designation, and may not meet KFA standards. Examples of CHUs that currently do not have the potential to meet KFA standards are CHU's 12 and 13; both units had reached a level of modification which prevents meeting KFA standards in those units.

Table 2. Designated critical habitat units with section 7 consultation history.

CHU	Size in acres	Ownership	Previously Modifed[1]	Level of Modification[2]
9	105	State, Private	Yes	42.9 acres[3]
12	166	Private, City	Yes	3.383 acres[4]
13	100	Private	Yes	1.88 acres
16	103	Private	Yes	4.7 acres[5]

[1] Unit had preexisting level of modification prior to Section 7 consultation.
[2] Anticipated level of modification resulting from past Section 7 Consultations.
[3] Includes areas of indirect effects. No direct effects associated with CHU 9.
[4] Includes only area of direct effects. Total is sum of two different consultations. Area of indirect effects occurred completely in preexisting residential area.
[5] Includes only area of direct effects. Area of indirect effects occurred in preexisting infrastructure (roads).

Species and Critical Habitat Threats

The primary threat to endangered Bexar County karst invertebrates is habitat loss due to increased human expansion and urbanization throughout the karst terrain in Bexar County. Threats associated with increased urbanization include filling in and collapsing of caves and interstitial spaces, alteration of drainage patterns, alteration of surface plant and animal communities, introduction of invasive red imported fire ants (RIFA) (*Solenopsis invicta*), contamination, and vandalism (USFWS 2011).

As the population of the San Antonio region has increased more than 75 percent in the past 30 years and is anticipated to increase more than 60 percent over the next 30 years, growth, public infrastructure, and private development related to growth is reasonably certain to occur within the Culebra Anticline (Loomis et al. 2014). Impacts to listed karst species from increased development may result from additional impervious cover, removal of surface vegetation, increased pollution, modification and/or destruction of karst features, and alterations to the surface and subsurface hydrological regimes. Development would remove natural vegetative cover; therefore, reduce cave cricket foraging areas and the potential carrying capacity for karst invertebrate habitat. Removal of woody surface vegetation may result in a reduction of vegetative root matter penetrating into subterranean voids, a potential point source for the introduction of nutrients into karstic ecosystems. Fragmentation of natural areas may result in a decreased occurrence of trogloxene species (e.g. cave crickets) that may dwell in karst features and directly import nutrients from the surface to the subsurface. In addition, development would increase the amount of impervious cover in the area, which would result in increased surface pollution runoff and in alterations to surface and subsurface hydrological regimes as water is redirected to man-made drainage systems. These changes may alter the quality and quantity of water entering karst voids.

Construction and development activities that do not destroy a cave entrance can still result in collapse of the cave ceiling or other adverse effects on the karst environment. On ranch land or in rural areas, it is not uncommon to use caves as trash dumps (Culver 1986, Reddell 1993) or to cover the entrances to prevent livestock from falling in (Elliott 2000). These activities can be detrimental to the karst ecosystem by causing direct destruction of habitat or altering the natural passage of organisms, water, detritus, and other organic matter into a cave. Quarrying of limestone and road base material is a widespread activity that can remove vegetation and destroy karst habitat. A number of occupied caves in Bexar County have been severely impacted in the past, and an examination of recent aerial photography reveals recent impacts to karst habitat near several other occupied caves.

Cave organisms are adapted to live in a narrow range of temperature and humidity. To sustain these conditions, both natural surface and subsurface flow of water and nutrients must be maintained. Decreases in water flow or infiltration may result in reduced humidity, slowing the rate of decomposition, while increases in water entering voids may flood habitats, cause drowning of void inhabitants and may wash away nutrients (USFWS 2011). Alterations to surface topography, including decreasing or increasing soil depth or adding nonnative fill, can change the nutrient flow into the cave, and affect the cave community (Howarth 1983). Changes in the amount of impermeable cover, collection of water in devices like storm sewers, increased erosion and sedimentation, and irrigation and sprinkler systems can affect water flow to caves and the surrounding karst. Changes in the quantity of water, its organic content, the timing and extent of flood pulses, or droughts may negatively impact the listed species.

Karst ecosystems are heavily reliant on surface plant and animal communities to maintain nutrient input, reduce sedimentation, and resist exotic and invasive species. As the surface around a cave entrance or over the associated karst ecosystem is developed, native plant communities are often replaced with impermeable cover or exotic plants from nurseries. The abundance and diversity of

native animals may decline due to decreased food and habitat, combined with increased competition and predation from urban, exotic, and pet species. As surface plant and animal communities are destroyed, food and habitat once available to trogloxenes decreases. Destruction of plant communities can lead to increased erosion that causes sedimentation within caves. Where native woodland and grassland communities are present, a perimeter area is needed to shield the core vegetation habitat from impacts associated with edge effects or disturbance from adjacent urban development (Lovejoy *et al*. 1986, Yahner 1988). Effects from such impacts can include increases in invasive species and pollutants, and changes in microclimates, which can adversely affect the listed species by impacting nutrient cycling processes important in cave/karst dynamics and the overall health of karst invertebrates.

Much of the habitat occupied by the Bexar County invertebrates is particularly sensitive to groundwater contamination, because little or no filtration occurs, and water penetrates rapidly through bedrock conduits (White 1988) and mesocaverns (Cowan et al 2007). The ranges of these species are becoming increasingly urbanized, and, thereby, they are becoming more susceptible to contaminants including sewage, oil, fertilizers, pesticides, herbicides, seepage from landfills, pipeline leaks, or leaks in storage structures and retaining ponds. Activities on the surface, such as disposing of toxic chemicals or motor oil, can contaminate caves (White 1988). Materials like cleaning agents, industrial chemicals, and heavy metals can also easily infiltrate subterranean ecosystems by the pollutants leaching into the karst, for example, from leaking underground storage tanks, or by being washed into the surface or subsurface drainage area. Contamination of karst habitat can also occur from the deposition of air pollutants in the surface or subsurface drainage area and improper disposal of litter, motor oil, batteries, or other household products in or near caves (White 1988).

Continued urbanization would increase the likelihood that karst ecosystems are polluted by contamination from chemical leaks and spills, which often have occurred in Bexar County. The TCEQ (2010) summarized information on groundwater contamination reported by a number of agencies, and listed 109 groundwater contamination cases that occurred in Bexar County between 1980 and 2000; the majority of them were spills or leaks of petroleum products. Groundwater contamination poses a threat to entire karst ecosystems and is particularly difficult to manage because pollutants can originate far from the sensitive karst site and flow rapidly through the subsurface (White 1988).

RIFA are a pervasive, nonnative ant species originally introduced to the United States from South America over 50 years ago and are an aggressive predator and competitor that has spread across the southern United States. Karst invertebrates in central Texas are especially susceptible to RIFA predation because most caves are relatively short and shallow. This threat is exacerbated by activities that accompany urbanization and that result in soil disturbance and disruption to native ant communities. RIFA have been found within and near many caves in central Texas and have been observed feeding on dead troglobites, cave crickets, and other species within caves (Elliott 1992, 1994, Reddell 1993, Taylor *et al*. 2003). They often replace native species, and evidence shows that overall arthropod diversity, as well as species richness and abundance, decreases in infested areas. Hot and dry weather may also encourage RIFA to move into caves during summer months, and cold weather may cause them to seek refuge or prey in the caves during the winter. Besides direct

predation, RIFA threaten listed invertebrates by reducing the nutrient input that fuels the karst ecosystem. Taylor *et al*. (2003) found that cave crickets often arrived before RIFA at baits placed above ground at night, but the arrival of RIFA corresponded to the departure of cave crickets, indicating competition for at least some food resources. Lavoie *et al*. (2007) also reported that cave crickets and RIFA ate the same baits. Of 36 caves visited during status surveys for BCKI, RIFA were found in 26 of them (Reddell 1993).

Models suggest climate change may cause the southwestern United States to experience the greatest temperature increase of any area in the lower 48 States (IPCC 2007). There is also high confidence that many semi-arid areas like the western United States would suffer a decrease in water resources due to climate change (IPCC 2007), as a result of less annual mean precipitation (Christensen *et al.* 2007). These predictions underscore the importance of special management to maintain karst moisture and temperature levels to ensure survival of the nine karst invertebrates.

In summary, threats to the nine Bexar County invertebrates include clearing of vegetation for commercial or residential development, road building, quarrying, or other purposes. Infestation by nonnative vegetation causes adverse changes in the plant and animal community and possibly in moisture availability. An increase in RIFA can occur with development and cause competition with and predation on other invertebrates in the karst ecosystem. In addition, filling cave features for construction, ranching, or other purposes can adversely affect the listed invertebrate species by reducing nutrient input, reducing small mammal access, and changing moisture regimes. Excavation for construction or operation of quarries can directly destroy karst features occupied by any of the nine Bexar County invertebrates, including the mesocaverns they use.

Analysis of the Species and Critical Habitat to be Affected

The SH 211 project area falls within the Culebra Anticline KFR in the Austin Chalk and Pecan Gap geologic units. Three federally listed endangered karst invertebrate species are known to occur in this KFR; *C. venii, R. exilis, and R. infernalis*. Portions of the project area will occur in karst zones 1, 2, and 3. Karst zones 1 and 2 are known to contain, or have a high probability of containing, listed karst species. The project, as proposed, would bisect CHU 26. TXDOT has determined that the proposed SH 211 project "may affect, and is likely to adversely affect" *C. venii*, *R. exilis*, and *R. infernalis*. TXDOT has also determined that the project will not destroy or adversely modify critical habitat for Bexar County karst invertebrates. *C. venii, R. exilis, R. infernalis*, and their designated critical habitat will be considered in this BO.

As of December 2014, at least 623 caves were known in Bexar County and at least 97 of those had been sealed or destroyed, including some that had not been biologically studied (Veni 2003). Based on observations of fauna, several of the blocked or destroyed caves were likely occupied by listed species (Veni 2003). At least 93 caves have been confirmed to contain listed karst invertebrates (USFWS 2011); however, because of the lack of complete sampling, it should be noted that this is not likely to represent the complete range for these species. Also, many of the caves are lacking the recommended protection of a minimum of 40 acres of contiguous, unfragmented, undisturbed land to maintain both the native plant and animal communities around the feature that would help protect the integrity of the cave community and support species recovery (USFWS 2011). Recent survey

efforts added four new confirmed locations for the two listed *Rhadine* beetles and seven new caves containing eyeless *Cicurina* sp. Records held at the Texas Memorial Museum indicate 35 additional caves in Bexar County known to contain unidentified, eyeless *Cicurina* sp. have been discovered. If any of these specimens could be confirmed as being one of the listed eyeless *Cicurina* sp., it could represent new localities for the species, potentially contributing to the species recovery.

There are four CHUs within the Culebra Anticline KFR. Details for each unit and the species that occur within them are described below.

CHU 14 consists of 292 acres of private land. The unit includes several large tracts of undeveloped woodland. There is a major roadway, Stevens Ranch Parkway, in this unit, and is in the process of being extended from the southwestern to western part of the unit. Some of the vegetation has been cleared in the past for ranching. Recent surveys indicate that there are 12 caves within CHU 14, 11 of which are known to contain *R. infernalis.* The remaining feature is believed to be occupied by *R. infernalis*, but the species identification has not been confirmed. A large-scale residential development has been proposed for the land surrounding CHU 14. The developer has proposed to conserve CHU 14 as a KFA for the long term conservation for *R. infernalis.*

CHU 15 consists of 217 acres of private land. The majority of the lands within CHU 15 are within a subdivision, and all are privately owned. Tracts in the subdivision are relatively large and still contain wooded vegetation, but roads and houses have fragmented the cave cricket foraging areas around all of the occupied caves. This CHU contains 11 known caves. Bracken Bat Cave is the only one that contains *C. venii* and four caves (Braken Bat Cave, Isopit, Obvious Little Cave, and Wurzbach Bat Cave) are known to contain *R. infernalis*. Currently, there are no plans to conserve any occupied karst features in CHU 15 for the long term conservation of *C. venii* or *R. infernalis*.

CHU 16 consists of 103 acres of private land. The unit contains several large, primarily undeveloped tracts of woodland, with Loop 1604, a major highway, to its east. With the exception of the cleared Loop 1604 ROW (about 4.75 acres), most of the unit is vegetated. However, some vegetation in the northern and northwestern part of the unit appears to have been cleared for livestock grazing and vegetation along the eastern edge of the unit has been impacted by a private access road. The area to the south of the unit is operated as a quarry. Caracol Creek Coon Cave is located in this unit and it is occupied by *R. infernalis*. One additional cave, Feature 1604-Z01, was found during surveys for the Loop 1604 widening project. An unidentified *Cicurina* was found in Feature 1604-Z01. Currently, there are no plans to conserve any part of CHU 16 for the long term conservation of *C. venii* or *R. infernalis*.

CHU 26 consists of 100 acres of private land. CHU 26 is currently undeveloped; however the proposed SH 211 project would bisect the unit. Woody vegetation in the eastern portion of the CHU has been thinned for ranching, while the western portion has been more heavily cleared. A CPS transmission line easement runs through the western side of the unit with a transmission tower pad located within cricket forage habitat and surface drainage area of Max and Robert's Caves. Max and Roberts Cave (also known as Stevens Ranch East and West) is known to contain *R. infernalis*. As a part of the proposed SH 211 project approximately 31-acres of CHU 26 will be included in a 40-acre KFA to include Max and Robert's Caves for the long term conservation of *R. Infernalis*.

III. ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of the proposed action on federally listed species, the Service is required to take into consideration the environmental baseline. The environmental baseline includes past and present impacts of all Federal activities in the action area (50 CFR 402.02) that have already undergone section 7 consultation, and any other State or private actions which are contemporaneous with the consultation in progress.

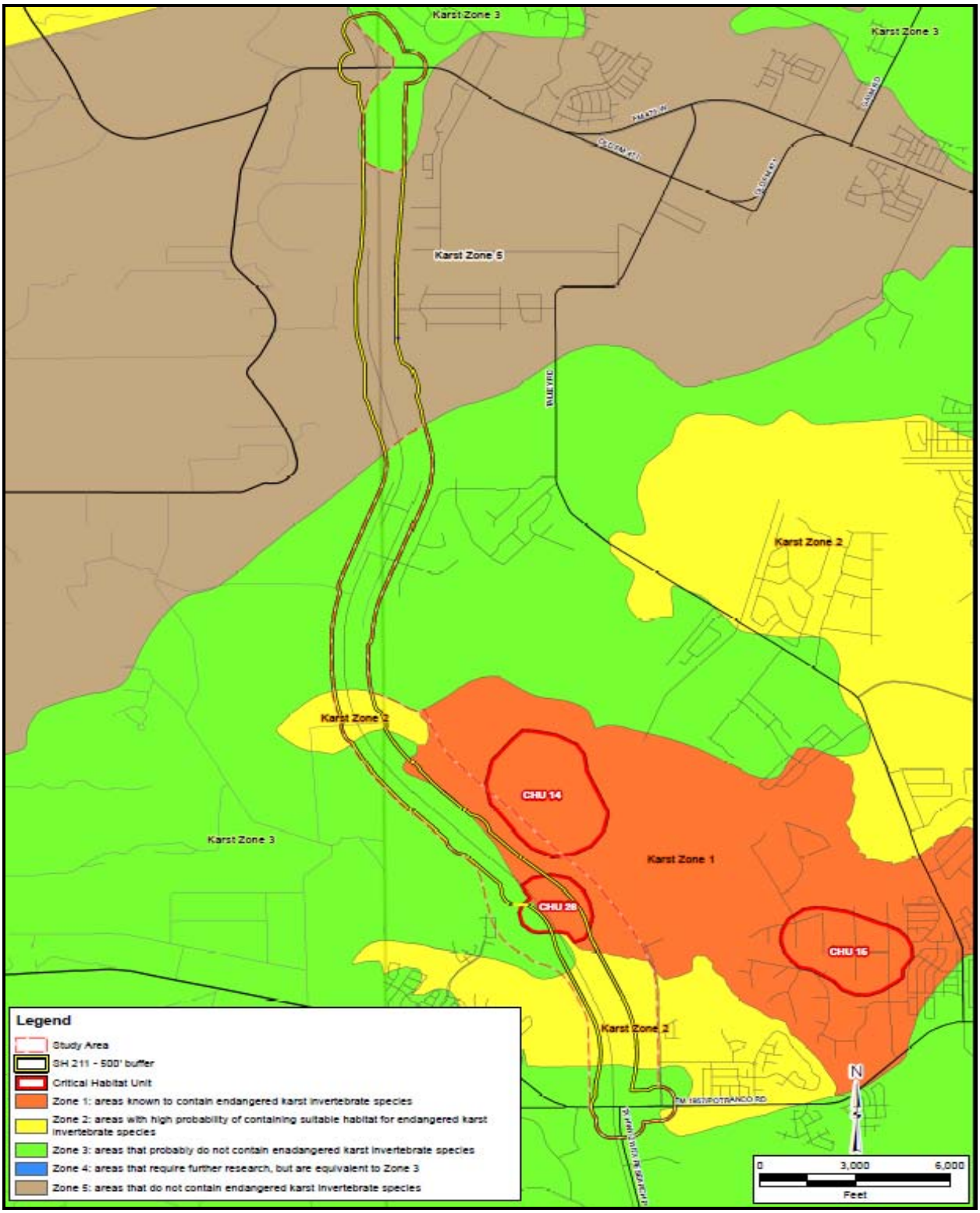
Status of the Species within the Action Area

TXDOT's biological consultants performed karst feature surveys on approximately 1,050 acre study area defined by a 500-foot offset boundary from the outermost SH 211 alignment, and additional survey area extending east to Steven's Ranch Parkway (Figure 5). The study area included all portions of karst zones 1-3 occurring within the action area. Also, previous reports for documented features known to be occupied by Bexar County karst invertebrates (Max and Robert's Caves, and Feature S-99) within the action area were utilized. The karst surveys revealed the presence of 148 possible karst features within the study area (Pape-Dawson Engineers, Inc. 2016). Seventy-eight of the 148 features were determined to be non-karst closed depressions, superficial karst (lacking subsurface extent), or manmade in origin. With the exception of Max and Roberts Caves and Feature S-99, the remaining 68 features were considered potential karst invertebrate habitat. A professional geoscientist ruled out 28 of the remaining 68 features as being potential karst invertebrate habitat.

The remaining 40 features were surveyed or baited, revealing 5 features containing Bexar County karst invertebrate species. Including Max and Robert's caves (designated as F-46 and F-47 in the karst terrain feature survey) and feature S-99, eight occupied features exist within the project study area with only Max and Robert's caves and Feature S-99 occurring within the proposed action area. All eight features within the study area are occupied by *R. infernalis*. Feature S-99 is known to be occupied by *R. infernalis* and an eyeless *Cicurina* sp. which could not be identified to species; therefore, the Service could not discount that eyeless *Cicurina* sp. found in Feature S-99 may be *C. venii*. No caves lie within the proposed 150-foot ROW, while Max and Roberts Caves and Feature S-99 are located within the 500-foot buffer where indirect effects have potential to occur.

Critical Habitat Unit 26 consists of private property within the Culebra Anticline KFR. Approximately 10 acres of CHU 26 occurs within the proposed ROW, and 2.52 acres would be converted to impervious cover. The proposed SH 211 alignment would almost equally bisect the CHU, and has the potential to disrupt the PBFs of the CHU. However, TXDOT proposes conservation measures in order to minimize impacts to the CHUs PBFs, and conserve a portion (31 acres) of the unit to include Max and Robert's Cave for the conservation of *R. infernalis*. The conserved 31 acres of CHU 26 will make up the majority TXDOT's proposed 40 acre preserve, and the remaining 9 acres consist of ROW adjacent to CHU 26.

Figure 5. Karst terrain study area of karst zones 1-3 within the proposed action area.



Factors Affecting the Species Environment within the Action Area

TXDOT's proposed action area is approximately 983 acres. Table 3 analyzes acreages that would be directly impacted (179 acres) within the proposed ROW, and indirectly impacted (804 acres) within the 500-foot buffer of the proposed project. Within the action area, a total of 103 acres were previously impacted by existing residential or commercial development. An additional 629 acres are expected to be developed in the future, leaving only 85 acres undeveloped within the action area.

Several prior section 7 consultations have occurred within the Culebra Anticline KFR, with only one occurring within the proposed SH 211 action area. Consultation history within the KFR and across the species range is discussed above in the "Rangewide Trends" for Bexar County karst invertebrates and their critical habitat, respectively. One section 7 consultation occurred within the proposed action area, and involved the placement of a CPS transmission line easement. The CPS easement runs through CHU 26 and parallels the proposed SH 211 ROW. CPS's existing transmission line has a tower pad located within cricket foraging habitat and surface drainage areas of Max and Robert's Caves. CPS's consultation with the Service resulted in a "may affect, not likely to adversely affect" determination for Bexar County karst invertebrates. The CPS consultation took place before the Service designated critical habitat for Bexar County invertebrates. However, given the conservation measures carried out as part of the issued biological opinion for the transmission line construction, only minimal impacts to the PBFs are likely.

Table 3. Analysis of area with direct and indirect effects, and existing impacts within the action area.

Area	Acres	% of Action Area	% of KFR*
Culebra Anticline KFR	16,873	-	100
Total action area	983	100	6
Proposed SH 211 footprint and ROW	179	18	1
500-foot buffer beyond ROW with only indirect effects	804	82	5
Other existing road or ROW impacts	-	-	-
Existing residential/commercial development	103	11	1
Reasonably certain future development	629	49	4
Undevelopable area (Floodplain, preserves, setbacks)	85	7	1

IV. EFFECTS OF THE ACTION

Factors to be Considered

Proximity of the action

TXDOT's proposed SH 211 construction would occur within the Culebra Anticline KFR, in an area that includes karst zones 1 and 2 within the KFR, and karst zone 3 adjacent to the KFR. The action area accounts for approximately 6 percent of the Culebra Anticline KFR. The construction footprint and cleared ROW would affect approximately 179 acres of surface habitat in the action area, along with an unknown amount of karst habitat below the soil surface within the proposed ROW.

The only endangered Bexar County karst invertebrate known to occur within the action area is *R. infernalis* in Max and Roberts Caves and Feature S-99. Feature S-99 is also known to be occupied by an unidentified eyeless *Cicurina* sp. which may be *C. venii*. Given the known occurrence of *C. venii* within the Culebra Anticline KFR approximately 1.2 miles from the project area, the Service cannot discount the unidentified eyeless *Cicurina* sp. may be *C. venii*. Also, *R. exilis* has been found within the Culebra KFR approximately four miles northeast of the project action area. Neither *C. venii* nor *R. exilis* were discovered within the action area during karst biota surveys.

Distribution

The direct effects would be localized to within the proposed SH 211 ROW, with indirect effects potentially occurring within the 500-foot buffer zone for the length of the project (7.6 miles). Approximately 34 acres of impervious cover would be added for the full length of the project. An additional 49 acres of ROW (the 40-acre preserve and 9-acre setback) are included as buffers around cave features where no construction activity is to take place.

Timing and Duration

Construction is expected to begin in 2017 and would take approximately three years to complete. Therefore, the project would span all climatological seasons. Karst invertebrates require stable temperature/moisture regimes associated with subterranean karst habitat. Karst voids that are exposed during construction would be closed as quickly as possible to maintain environmental conditions within the voids. The direct effects to the karst invertebrates would occur during subsurface excavation or construction of the roadway. Indirect effects, such as alternation of the species ability to carry out their normal lifecycle, including emigration/immigration across the project work zone, or changes to the climatic conditions in the cave may be temporary or permanent. Temporary indirect effects may occur in association with temporary exposure of a newly discovered cave to the outside environment during species sampling efforts. Those effects would only last until the feature can be permanently sealed. However, if a feature cannot be permanently sealed, the temporary effects would become permanent and persist throughout the duration of the project. Temporary effects may also occur where vegetation must be disturbed during construction and would persist until vegetation is reestablished in the work areas within the ROW.

Nature of the effect

The effects associated with highway construction activities would directly alter the karst habitat within the action area if karst voids are encountered during construction. However, the project would not affect the overall population size, variability, or distribution outside of the action area. The project has been designed to minimize impacts to Bexar County karst invertebrate habitat through TXDOT's proposed voluntary conservation measures. Effects would only occur within the 983 acre project action area in karst zones 1-3. Excluding shallow geotechnical boreholes, no excavation would occur in karst zone 1 or critical habitat. If any karst features are uncovered during construction, work near the feature would stop and a professional geoscientist would investigate the feature to determine if karst invertebrate habitat exists within the feature. If the feature contains potential karst invertebrate habitat, it would be surveyed by a Service permitted biologist to

determine if it is occupied by any of the endangered karst invertebrates. TXDOT would evaluate further project impacts for any new feature found to contain endangered karst invertebrates. To the maximum extent practicable, additional impacts to the feature would be avoided and the feature would be permanently sealed. Discovery of previously unknown karst voids occupied by Bexar County karst invertebrates may result in changes to the stable climatic conditions in the feature, negatively affecting the species.

Disturbance frequency, intensity, and severity

Disturbances associated with construction are predominately limited to single events along the length of the project. These disturbance events include vegetation clearing, milling excavation, drilling geotechnical boreholes, and drilling bridge support shafts. These disturbances will occur at different times until project completion. Vegetation clearing and drilling of geotechnical boreholes will occur at the beginning of the project. Milling excavation and drilling of bridge support shafts will occur as construction of the project progresses. The addition of impervious cover in critical habitat has the potential to create a persistent disturbance to PBFs which will last past the project's completion. Approximately 10 acres of vegetation removal will occur in CHU 26, and 2.52 acres of impervious cover will be added.

The intensity of disturbance will vary depending on construction activity. All construction activities are temporary, but do not have the same level of intensity. In karst zone 2, excavation activities are much greater in a concentrated area due to construction of the Potranca Creek Bridge. Other excavation activities occurring throughout the remainder of the project are relatively minor in comparison with excavation occurring for the construction of Potranca Creek Bridge; this is due to the amount of excavation, and the karst zone the excavation is occurring in. Excavation activities in karst zone 3 are unlikely to encounter karst invertebrate habitat, while excavation in karst zone 2 has a greater probability of encountering karst voids and endangered karst invertebrates.

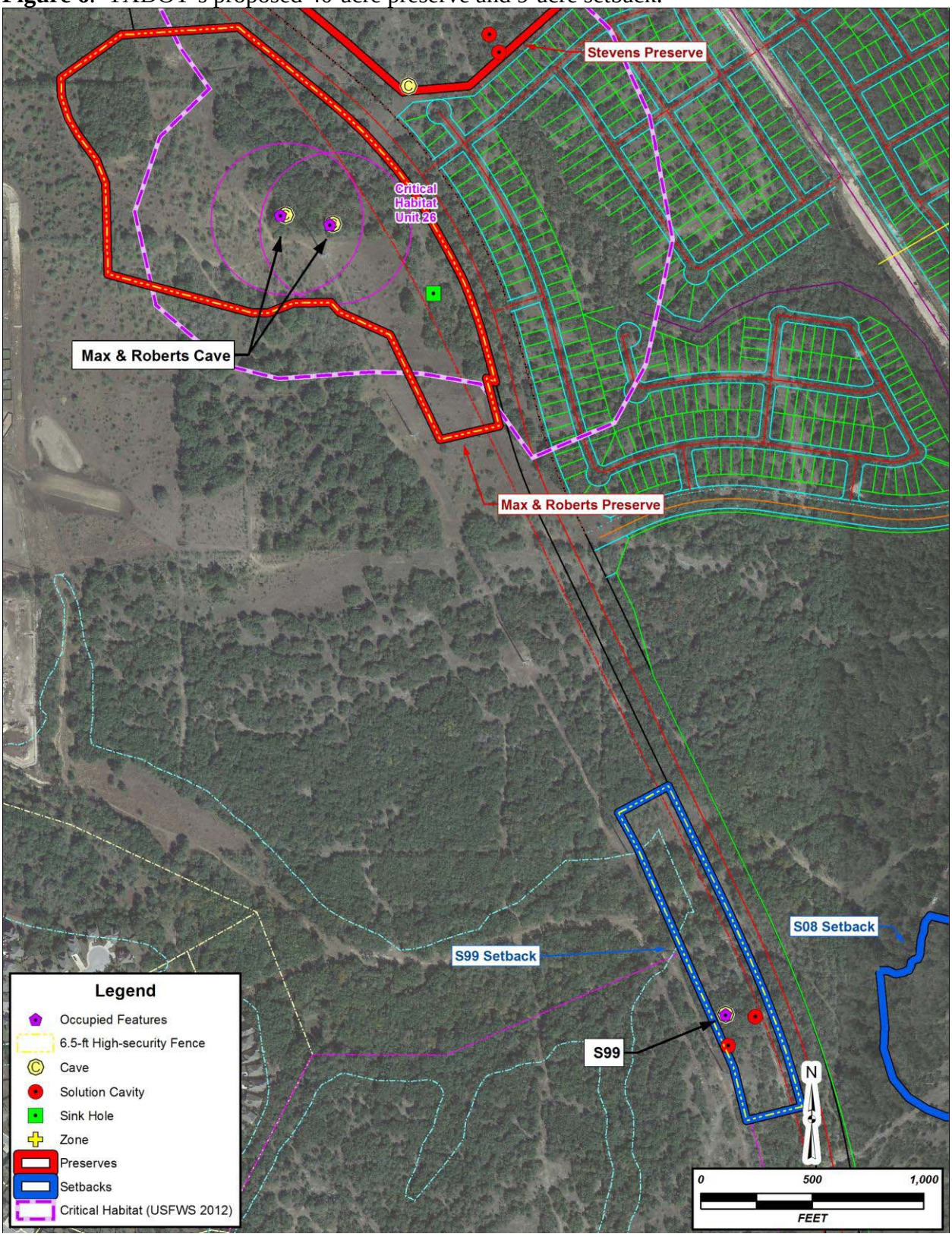
Determining specifically how populations of endangered karst invertebrates will react to these disturbances is not possible. However, the majority of these disturbances are temporary. Vegetation will be restored to the maximum extent practicable, excluding areas where impervious cover has been added. Any excavation events will be localized, and if karst voids are uncovered during excavation activities TXDOT will follow protocol discussed in their proposed conservation measures. TXDOTs conservation measures will limit the amount of time Bexar County karst invertebrates are exposed to construction activity, and will minimize any persistent effects associated with the operation and management of the roadway.

Analysis for Effect of Effects of the Action

Beneficial effects

All conservation measures proposed by TXDOT for this project would benefit endangered Bexar County karst invertebrates in the action area to some degree. Beneficial conservation measures include the creation of a 40-acre preserve around Max and Roberts Cave, the creation of a 9-acre setback around feature S-99 (Figure 6), and legally binding agreements to manage the preserve and

Figure 6. TXDOT's proposed 40-acre preserve and 9-acre setback.



setback in perpetuity for the long term conservation of *R. infernalis*. All preserve management will be carried out in accordance with the Karst Preserve Management Plan for Steven Ranch. Although the proposed 9-acre setback around Feature S-99 does not meet KFA standards, the feature and endangered karst invertebrates within the feature, will benefit from at least some level of protection and management in perpetuity. Given the level of proposed development that is reasonably certain to occur within the Culebra KFR, and within and adjacent to the project action area, creation of these preserves could contribute to downlisting criteria for *R. infernalis* within the Culebra KFR and protect from encroaching development.

Direct Effects to Bexar County Karst Invertebrates

Direct effects are immediate effects of the project on the species or its habitat. Direct effects to *C. venii*, *R. exilis*, and *R. infernalis* may occur as a result of exposure to construction activities. The project may remove up to 179 acres of vegetation, add 34 acres of impervious cover, and will require various excavation activities. Individuals of these species are difficult to detect unless observed undisturbed in their environment, and occupied karst features in this area are often undetectable until they are exposed by surface or bedrock disturbing activities. Direct effects occurring from project activities would be related to vegetation clearing and removal of subsurface habitat associated with the drilling of geotechnical boreholes and bridge support shafts, vegetation clearing within the ROW, surface milling, and grading. Any activity that alters the soil surface and underlying karst geology could result in direct mortality or injury, to individual *C. venii*, *R. exilis*, and *R. infernalis*. Harm could also result from significant modification or degradation of the karst habitat, such as alteration of surface and subsurface drainage patterns, fragmentation of trogloxene foraging areas, changes to temperature and humidity regime, changes to mesocavern connectivity, changes to water flow and nutrient input, reduction in the carrying capacity of the karst habitat, and introduction of invasive species.

Max and Robert's Caves, and Feature S-99 are the only occupied karst features known to occur within the project action area. No other features occur within the proposed ROW. Only Feature S-99 would be directly affected by the project due to approximately 0.43 acres of the 8.5-acre cave cricket foraging area being located within the proposed ROW. Approximately 8.07 acres of vegetated cave cricket foraging area would remain for Feature S-99 after construction.

R. infernalis is known to occur in Max and Robert's Caves in CHU 26 and Feature S-99; however, the species was not documented in any other features during karst biota surveys. No direct effects are expected within the Max and Robert's Caves while direct effects to Feature S-99 will be minimized to the maximum extent practicable. Even though Feature S-99 will be directly impacted due to the removal of 0.43 acres of cave cricket foraging habitat, the majority will remain and be protected within a 9-acre setback which will be managed in perpetuity. *C. venii* and *R. exilis* are not known to occur within the action area; however, given their known proximity to the project and the presence of an unidentified eyeless *Cicurina* sp. within Feature

S-99, their occurrence within unknown features that may be disturbed during subsurface excavation is possible. The destruction of void spaces in the project area could occur during subsurface excavation activities, possibly changing mesocavern connectivity of the caves. Known surface and

subsurface drainage basins for Max and Robert's Caves and Feature S-99 will not be directly affected by the proposed project.

Drilled shafts and support piers and footings for bridges will involve drilling 24 to 36 inch diameter shafts between 22 and 52 feet deep. The project would require 38 drilled shafts that would result in the removal of approximately 2,032 cubic yards of subsurface limestone and potential karst habitat within karst zones 2 and 3. Drilled shafts have the potential to completely destroy or remove a significant portion of a karst void, resulting in significant changes to the karst ecosystem.

Roadway excavation activities involve surface milling to lower the grade of bedrock to the desired road base depth, grading the ground surface to level it after the milling is complete, and excavation with trackhoes or backhoes. Roadway milling excavation would range from 0 to 15 feet below the current grade with an average excavation of three feet below grade. Total excavation for the proposed project would affect approximately 232,775 cubic yards of fill and natural surface material. Up to 115,970 cubic yards of subsurface limestone in karst zones 2 and 3 may be excavated. Roadway excavation activities may result in effects of varying magnitude to uncovered karst voids, depending on the depth of the excavation and the extent of the karst feature. Erosion may cause a small opening in the roof of a karst feature to expand greatly in a short period of time. Karst features discovered during excavation activities may be partially preserved by permanently capping the feature, however the surface drainage basin would likely be significantly altered.

The installation of stormwater BMPs can be installed via open trench methods, using a trackhoe, backhoe, or trencher. Trenches will be up to three feet deep and five feet wide. Utility lines would not be installed for this project. The installation of stormwater BMPs and drainage excavation would be no more than one foot deep in clay or fill and would not result in the removal of subsurface limestone. Table 4 lists the project related ground disturbing construction and associated volume totals within each KZ with potential for direct effects to BCKI.

Table 4. Excavation volumes within karst zones and critical habitat.

Location	Type of Construction	Volume of Excavation (y3)
Karst Zone 5	Total Excavation	116,815
Karst Zone 3	Total Excavation	73,443
	Road Bed and Ditch Excavation	70,089
	Bridge Piers and Abutments	201
	Channel grading	350
	Pedestrian Crossing	664
Karst Zone 2	Total Excavation	42,527
	Road Bed Excavation	39,823
	Bridge Piers and Abutment	1,831
	Channel Grading	350
Karst Zone 1 and Critical Habitat	Total Excavation	0
All Karst Zones	Total Excavation	232,775

Indirect Effects to Bexar County Karst Invertebrates

Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Indirect effects could occur within the entire extent of the 983 acre action area. The proposed project may result in indirect impacts to karst invertebrate habitat from surface disturbances such as vegetation removal, which may result in alterations in nutrient input and outflow and the introduction of invasive species (e.g. red imported fire ant). Other indirect effects to karst invertebrate habitat may occur due to the placement of impervious cover which could increase chemical runoff or erosion and alterations in surface and subsurface drainage that may result in short and long term changes to temperature and moisture regimes in karst habitat.

Changes in the physical environment beneath a newly constructed road can create edge effects that extend beyond the construction timeframe. One of the edge effects is the reduction in water vapor transport into and out of the natural environment caused by the addition of the impervious surfaces of roadways. Natural surfaces, especially those with vegetation, use heat energy for evapotranspiration of water; this allows them to cool. However, roadways store heat energy which raises the surface temperature of the roadway and the immediate surrounding area while lowering the humidity of the area immediately adjacent to the roadway (Barnes et al. 2012). Roadway materials, such as dark asphalt pavement are thermally conductive, meaning they have the ability to absorb more heat and rapidly move it into the ground beneath the road surface. Heat stored by roadways is released at night, after the sun has gone down, creating a heat island when compared with surrounding soil or vegetation (Trombulak and Frissell 2000). Roadway heat islands exacerbate subsurface impacts to temperature and moisture by perpetuating drying conditions.

Indirect impacts due to future degradation of groundwater quality entering subsurface features resulting from roadway runoff contaminated with increased sediment and hazardous materials from accidental spills and vehicle collisions may also impact subsurface karst invertebrate habitat. Temporary and permanent BMPs, such as silt fences, rock berms, and detention ponds implemented in accordance with the project's stormwater pollution prevention plan and municipal separate storm sewer systems compliance documents are intended to mitigate for these impacts both during construction and for the duration of roadway operation.

Effects to Critical Habitat Physical and Biological Features

Approximately 10 acres of CHU 26 occur within the project action area. Construction activities would result in the addition of 2.52 acres of impervious cover through clearing, filling, and adding a 40-foot paved section. Impacts to the PBFs of CHU 26 are likely to occur over time. Actions that may impact PBFs as a result of this project include vegetation removal, alteration of surface topography through addition of impervious cover, introduction of pollutants, and attraction of invasive species. The project may also reduce the number mammals that frequent the caves resulting in a reduction of nutrient input to features within the unit.

TXDOT has proposed conservations measures to minimize effects to the PBFs of CHU 26 to include; no excavation of CHU 26, diverting and treating stormwater runoff from the road away from critical habitat and associated karst features, restricting PSLs away from the ROW adjacent to CHU 26, revegetating disturbed areas with native species in the ROW, prohibiting use of pesticides

and herbicides for vegetation management in TXDOT ROW, and managing RIFA occurring within the ROW adjacent to CHU 26. Also, TXDOT will conserve a portion (31 acres) of the unit to include Max and Robert's Caves and their associated PBFs. Aside from Max and Robert's caves, no other known occupied features occur with CHU 26.

Species' response to the proposed action

Determining a quantifiable response of *C. venii*, *R. exilis*, and *R. infernalis* to the proposed action is not possible given research data collection challenges associated with these species. Reliably determining these species' population sizes in the action area, their sensitivity to change, their resilience, and their ability to recover after a disturbance is not possible. TXDOT has conducted surface surveys for karst habitat and investigated all potential karst features found in the project's study area. The only features occupied by any endangered karst invertebrate in the action area are Max and Robert's Caves and Feature S-99. TXDOT has designed the project to avoid direct impacts to Max and Robert's Caves while minimizing direct impacts to Feature S-99. Aside from these features, there are no known karst features within the action area containing endangered karst invertebrates. TXDOT has also proposed conservation measures to avoid and minimize impacts to PBFs of CHU 26. TXDOT will also establish a 40-acre preserve and a 9-acre setback for the conservation and recovery of *R. infernalis*.

V. CUMULATIVE EFFECTS

Cumulative effects are those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation. 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.

TXDOT has evaluated the existing and proposed impacts related to growth and development with the Culebra Anticline KFR (Table 5). The KFR covers approximately 16,873 acres, and entirely consists of karst zones 1 and 2. Existing development within the KFR is approximately 13,403 acres (79.43%), with approximately 3,470 acres (20.56%) currently undeveloped. There are several master planned developments proposed for construction in the KFR, totaling about 2,091 acres (12.39%), and if constructed, would total 15,494 acres (91.82%) of development within in the KFR.

Table 5. Analysis of existing conditions and potential future impacts related to growth and development in the Culebra Anticline KFR and Designated Critical Habitat.

Existing/Future Conditions	Acres	% of KFR
Culebra Anticline KFR	16,873	100
Existing development in KFR	13,403	79
Existing undeveloped area in KFR	3,470	21
Proposed future development in KFR	2,091	12
Total development potential (existing and proposed)	15,494	92
Undeveloped area (after future development)	1,379	8
Total designated critical habitat in KFR	712	4
Existing development within CHUs	247	1

Potential future development within CHUs	447	3
Total proposed project action area	983	6

A total of 629 acres of development is reasonably certain to occur within the proposed action area. Impacts to Bexar County endangered karst invertebrates from increased development within the proposed action area may result from the following cumulative impacts analyzed below:

(1) Development will increase the amount of impervious cover in the area which may result in increased surface pollution runoff, and alterations to the hydrological regime as water is redirected to other areas. These changes may alter the quality and quantity of water entering the surface and subsurface drainage basins of subterranean voids. Decreases in water flow or infiltration could result in reduced humidity or slowing of decomposition, while increases in water may flood habitats causing drowning of endangered karst invertebrates or washing away of nutrients (USFWS 2011).

(2) Construction activities related to urban development and growth may lead to loss of karst invertebrate habitat if voids are encountered and filled or destroyed. Cave modification or destruction reduces overall available habitat and blocks movement corridors.

(3) Development will remove natural land cover, therefore reducing cave cricket foraging habitat, and the carrying capacity for karst invertebrate habitat. Removal of woody surface vegetation may result in a reduction of vegetative root matter penetrating into subterranean voids, a potential point source for the introduction of nutrients into karst features. Fragmentation of natural areas may result in a decreased occurrence of vertebrate trogloxene species (e.g., raccoon, cave crickets) that may dwell in karst features and directly import organic material from the surface to the subsurface.

Impacts to a portion of Critical Habitat Unit 26 in the action area include reasonably certain residential development on the west side of the unit (Figure 6). Development in these portions of the critical habitat unit will impact the karst formation during subsurface excavation for utilities and houses. The urbanization of this part of the critical habitat unit will be impacted by increased impervious cover and will reduce surface and subsurface sources that provide nutrient input into the karst ecosystem.

VI. CONCLUSION

C. venii, *R. exilis*, and *R. infernalis* are known to occur in areas of suitable karst habitat located in the Culebra Anticline KFR of Bexar County. All existing known karst features within the action area have been surveyed for the presence of listed karst invertebrates. It is unknown if there are any additional karst features which have yet to be discovered within the action area beneath the existing soil surface, although the presence of additional karst features is likely. If karst features are present, it is also unknown if they are occupied by endangered karst invertebrates.

After reviewing the current status of *C. venii*, *R. exilis*, and *R. infernalis*, the environmental baseline for the action area, the effects of the proposed SH 211 project, and the cumulative effects, it is the

Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of *C. venii*, *R. exilis*, and *R. infernalis* nor result in the adverse modification or destruction of designated critical habitat for endangered Bexar County karst invertebrates. The reasons for the determination are explained below.

R. Infernalis is known to occur in Max and Robert's Caves and feature S-99 located within the project action area. TXDOT has avoided direct impacts to Max and Robert's Caves, while the project will have a small direct impact to Feature S-99. Feature S-99 is within the project ROW and only 0.43 acres of cave cricket foraging habitat will be directly impacted. Feature S-99's surface and subsurface drainage basins will not experience direct impacts due to the project. TXDOT has proposed conservation measures to avoid and minimize impacts to these features, and will protect and manage these features in perpetuity for the long-term conservation and recovery of *R. infernalis*. This species is relatively abundant throughout its range when compared to other endangered Bexar County karst invertebrates, and has a higher potential for recovery. TXDOT's establishment of a 40-acre preserve will contribute to a high quality KFA, and increase the probability of *R. infernalis* reaching recovery criteria within the Culebra Anticline KFR recovery unit. The 9-acre setback does not meet the standards to qualify as a KFA, but the feature will be protected and managed in accordance with the Service approved Karst Preserve Management Plan for the Stevens Ranch Preserves; thus increasing the likelihood of species persistence within the feature.

R. exilis has also been documented within the Culebra Anticline KFR approximately 4 miles to the northeast near Loop 1604. Karst biota surveys within the project study area and in adjacent Stephens Ranch property east of the project did not document any features containing *R. exilis*. Therefore, it is the Service's opinion that the probability of encountering a karst void containing the species during the construction of this project is low, but not impossible. Harm is reasonably certain to occur if unknown karst voids containing the species are uncovered or destroyed as a result of this project. *R. exilis* is also relatively abundant when compared to other endangered karst invertebrates and has a higher potential for recovery if conservation efforts are successful. TXDOT has requested formal consultation for *R. exilis* due to the proximity of one location to the project action area.

C. venii has only been documented within the Culebra Anticline KFR. Karst biota surveys did not document any occurrences of *C. venii* within the action area, or the larger study area to include portions of Stevens Ranch. However, Feature S-99 does contain an unidentified eyeless *Cicurina* sp. The closest known occurrence of *C. venii* to the proposed project is approximately 1.2 miles to the east of the project area in CHU 15. Therefore, given the proximity of a known *C. venii* location to the action area, the Service cannot discount the possibility that the eyeless *Cicurina* sp. in Feature S-99 is *C. venii*. The project will impact a small portion of cave cricket foraging habitat of Feature S-99. However, TXDOT's proposed conservation measures will minimize effects to endangered karst invertebrates in Feature S-99, and the feature will also be protected in a 9-acre setback and managed in perpetuity. If the eyeless *Cicurina* sp. in S-99 is determined to be *C. venii* in the future, then a legally binding mechanism for protection and management will already be in place for the species. TXDOT has requested formal consultation for *C. venii* due to the proximity of two locations to the project action area, and the occurrence of an eyeless *Cicurina* sp. in Feature S-99.

Neither *C. venii* nor *R. exilis* have been documented within the project action area, and impacts to these species may not occur as a result of this project. However, given the known occurrences of *C. venii* and *R. exilis* in proximity to the project, the Service cannot discount the possibility of these species occurring in unknown karst voids and mesocavernous spaces within the action area. The probability of impacting these species is likely less than that of impacting *R. infernalis*; this is due to the known occurrence of *R. infernalis* in Max and Robert's Caves and Feature S-99 within the action area. Despite the chances of impacting *C. venii* and *R. exilis* being lower, TXDOT's proposed conservation measures and project design will minimize possible impacts to these species. The maximum amount of surface habitat that would be directly impacted is 179 acres. The project would add 34 acres of impervious cover, and will modify excavation activities to minimize the amount of karst habitat to be affected. The amount of surface habitat to be directly impacted is less than one-fifth (18%) of the action area and only a small fraction of the potential habitat in the Culebra Anticline KFR. The Service believes that if *C. venii* and *R. exilis* are present within the action area, the proposed conservation measures and modifications of roadway construction and alignment will minimize possible impacts and will not appreciably reduce the likelihood for species survival and recovery.

The establishment and management of conservation easements will contribute to the recovery of endangered Bexar County karst invertebrates. In light of development which is reasonably certain to occur within the Culebra Anticline KFR and within the action area, the conservation easements will protect endangered karst invertebrates from encroaching development. These conservation easements will be legally binding, require management and monitoring in accordance with the Service approved Karst Preserve Management plan for the Stevens Ranch Preserves, and will be protected and managed in perpetuity. The creation of these conservation easements mitigate for impacts associated with this project, protect against future development which is reasonably certain to occur, and contribute to the long-term conservation and recovery of *R. infernalis*. These conservation easements also have the potential to contribute to the survival and recovery of other endangered Bexar County karst invertebrates if they are later discovered within the protected features.

Destruction or adverse modification of critical habitat refers to direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation for listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features. The Service has determined that the project, as proposed, would not result in the destruction or adverse modification of designated critical habitat for endangered Bexar County karst invertebrates.

The project will likely adversely affect the PBFs of CHU 26, but not to the extent that will appreciably diminish its value or the value of critical habitat for endangered Bexar County karst invertebrates. Approximately 41 acres of CHU 26 are within the action area, and 10 of those acres are within the proposed ROW where vegetation removal would occur. Approximately 2.52 acres of impervious cover would be added to the unit. The project will bisect the unit and leave 31 acres to the west and 59 acres to the east of the 10 acre ROW. The western 31 acres will be preserved as part of TXDOT's proposed 40-acre preserve centered on the PBFs of Max and Robert's Caves. There

are no known occupied karst features in the eastern 59 acres of the unit. However, a portion of the eastern 59 acres will be preserved through the HCP process for development that is reasonably certain to occur in the adjacent Stevens Ranch property.

The proposed SH 211 alignment was designed to avoid surface and subsurface drainage basins of all known occupied features to include Max and Robert's Caves in CHU 26. The surface and subsurface drainage basins of Max and Robert's Caves occur upgradient, and runoff from the road will be carried in bar ditches away and out of critical habitat; thus minimizing potential pollutants to enter the occupied features themselves, the surface and subsurface drainage basins, or the surrounding mesocaverns.

The Service believes TXDOT's proposed conservation measures and conservation of 31 acres of critical habitat around Max and Robert's Caves are sufficient to minimize impacts to the PBFs. The project will not impact cave cricket foraging area or surface and subsurface drainage basins of Max and Robert's Caves. The project, as proposed, will likely have a minor effect on the PBFs of the unit, but will not adversely modify or destroy the unit nor diminish the value of available critical habitat for the conservation and recovery of *R. infernalis* and other Bexar County karst invertebrates.

The conclusions of this BO are based on full implementation of the project as described in the "description of the Proposed Action: section of this document, including any Conservation measures that were incorporated into the proposed action.

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 as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include death or injury to a listed species, or significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by TXDOT, as appropriate, for the exemption in section 7(o)(2) to apply. TXDOT has a continuing duty to regulate the activity covered by this incidental take statement. If TXDOT (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, TXDOT

must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take Anticipated

It is anticipated that take of *C. venii*, *R. exilis*, and *R. infernalis* would be difficult to detect and quantify due to their extremely small size and subterranean, often inaccessible, karst habitat. The presence of these species is rarely known unless observed in their natural karst environment. Also, occupied karst features in the action area are often undetectable until they are exposed from surface disturbing activities. Therefore, a precise mechanism for predicting the number of individuals that may actually be harmed by the proposed project is not available. Due to these factors, the extent of incidental take will be equated to the total action area occurring within karst zones 1 and 2, respectively. Approximately 96 acres of karst zone 1 and 162 acres of karst zone 2 occur within the project action area. The extent of authorized take in the form of harm is 96 acres in karst zone 1 and 162 acres in karst zone 2 for any currently unknown karst features containing *C. venii*, *R. exilis*, and *R. infernalis*.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of *C. venii*, *R. exilis*, and *R. infernalis*.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of *C. venii*, *R. exilis*, and *R. infernalis*:

1. TXDOT must minimize harm and harassment of endangered Bexar County karst invertebrates during construction of SH 211, and all associated activities.

Terms and Conditions

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

1. TXDOT must implement all conservation measures associated with this project, to include the management of vegetation and RIFA in TXDOT ROW adjacent to the 40-acre preserve and critical habitat. Management activities in these areas will be consistent with those outlined in the Karst Preserve Management plan for the Stevens Ranch Preserves.

2. TXDOT must hold a pre-construction meeting with its employees and contractors working on this project. TXDOT must provide specific instruction on the implementation of TXDOT's proposed Conservation Measures and the Service's Reasonable and Prudent

Measures, included in this Incidental Take Statement. Instructions specific to the contractor(s) related to implementation of the Conservation Measures and Reasonable and Prudent Measures must be documented in writing. TXDOT is ultimately responsible for informing anyone working on this project of these requirements.

3. TXDOT must monitor and report to the Service the amount of incidental take that occurs in association with this project. This must be done through sufficient on-site inspections to determine if construction related impacts have or would occur outside of the action area, as described in this BO. The monitoring reports must include a summary of construction actions implemented during the previous six-month period, any unanticipated actions or delays in project completion, and any known incidental take that has occurred (disturbance of karst invertebrate habitat) and the reasons for that take. Monitoring reports must be submitted in accordance with the timelines proposed in TXDOT's project monitoring and reporting Conservation Measure. Monitoring reports must be submitted in January and June of each year during construction, once at the completion of construction, and a final report one year after construction was completed.

Conservation Recommendations

Section 7(a)(l) of the Act directs TXDOT, as well as other 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 Service’s conservation recommendations are:

1. Publish the genetic study results associated with the Loop 1604/SH 151 roadway project. The results of this study would provide information on the current status of listed karst invertebrate species and would clarify knowledge of terrestrial karst fauna distribution in Bexar County.

2. Consider participating in the Southern Edwards Plateau Habitat Conservation Plan (SEP-HCP) for the conservation of occupied karst features in Bexar County.

Reinitiation Notice

This concludes the Service's formal consultation on the action outlined in TXDOT's formal consultation request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) the project is not completed within five years of the date of this BO; (3) new information reveals the agency action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this opinion; (4) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (5) a new species is listed or critical habitat is 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 immediately pending reinitiation.

The Service appreciates the coordination and cooperation of TXDOT staff during this consultation and we look forward to finalization of the biological opinion upon receipt of your comments. If further assistance or information is required, please contact Tanya Sommer at (512) 490-0057, extension 222.

Sincerely,

Adam Zerrenner
Field Supervisor

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U.S. Department
of Transportation

**Federal Highway
Administration**

Texas Division Office
300 E. 8th Street, Rm. 826
Austin, Texas 78701

March 10, 2011

In Reply Refer To:
HA-TX

Request for Environmental Classification
Bexar and Medina Counties
SH 211: From FM 1957 to FM 471
CSJ: 3544-03-002, etc.

Melissa A. Neeley
Project Delivery Section Director
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701

Dear Ms. Neeley:

The Federal Highway Administration (FHWA) has reviewed the Texas Department of Transportation Environmental Affairs Division (TxDOT ENV) Request for Environmental Classification, dated January 26, 2011 and received in our office on January 31, 2011, for the proposed SH 211 project. The proposed project would construct 7.6 miles of new location roadway. The proposed new roadway alignment would be a two-lane arterial located on 150-feet (typical) of right-of-way.

Based on the information provided in the TxDOT ENV Request for Environmental Classification and discussion with the TxDOT, FHWA's decision is to classify the SH 211 environmental document as an Environmental Assessment.

Therefore, the preparation of an Environmental Impact Statement (EIS) is not required at this time since the significance of the environmental impact is not clearly established and significant environmental impact is not expected. This decision, however, is based on information known to date and should significant environmental impacts be identified during the environmental process, FHWA will require that an EIS be prepared in accordance with 23 CFR 771.119.

Should you have any questions regarding this determination, please contact me at 536-5954 or justin.ham@dot.gov.

Sincerely,

Justin R Ham
Urban Engineer

U.S. Department
of Transportation
**Federal Highway
Administration**

Texas Division

J.J. "Jake" Pickle Federal
Office Building
300 E. 8th Street, Room 826
Austin, TX 78701

November 19, 2014

In Reply Refer To:
HA-TX

Biological Assessment
Bexar and Medina Counties
CSJ: 3544-03-002, 05-001, 04-002, and 06-001
SH 211: From FM 1957 to FM 471

Mr. Adam Zerrenner, Field Supervisor
US Fish and Wildlife Service
Austin Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, Texas 78758-4460

Dear Mr. Zerrenner:

Enclosed please find one copy of the Biological Assessment for a proposed project in Bexar and Medina Counties, Texas. In accordance with Section 7 of the Endangered Species Act, the Federal Highway Administration (FHWA) is requesting to initiate formal consultation on the State Highway (SH) 211 project.

This project proposes to construct SH 211 as a two-lane rural highway on new location for approximately 8 miles between FM 1957 and FM 471 in Bexar and Medina Counties, Texas.

The Biological Assessment finds the proposed project may affect, and is likely to adversely affect, an unnamed ground beetle (*Rhadine infernalis*). In addition, the proposed project may affect, and is not likely to adversely affect the Braken Bat Cave Meshweaver (*Cicurina venii*). The proposed SH 211 improvements may result in an incidental take of the unnamed ground beetle species. The FHWA requests a concurrence with a no-jeopardy finding as part of the Biological Opinion for the unnamed ground beetle and the Braken Bat Cave Meshweaver.

If you have any further questions, please feel free to contact me at (512) 536-5954.

Sincerely,

Justin R. Ham
Urban Engineer

Enclosure

cc: TxDOT – San Antonio District without enclosure
cc: TxDOT - Environmental Affairs Division without enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

RECEIVED - TXDOT
MAR 11 2015
ENVIRONMENTAL AFFAIRS

March 5, 2015

Mr. Carlos Swonke
Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701-2483

Consultation Number 02ETAU00-2015-F-0127

RE: CSJs# 3544-03-002, 3544-05-001, 3544-04-002, & 3544-06-001

Dear Mr. Swonke:

Thank you for your letter of January 30, 2015, requesting formal consultation for the above referenced CSJs in which the Texas Department of Transportation (TxDOT) is proposing to construct a new section of SH 211, between FM 1957 and FM 471, in San Antonio, Bexar County, Texas. TxDOT has submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (Service) requesting initiation of formal section 7 consultation for the proposed project which "may affect, and is likely to adversely affect" Bexar County karst invertebrates *Cicurina venii* and *Rhadine infernalis*, species listed pursuant to the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The proposed project would also impact a designated Critical Habitat unit for *R. infernalis*. Your request to initiate formal consultation was received on February 02, 2015.

We have reviewed the biological assessment provided by TxDOT and have determined it does not provide sufficient information for us to proceed. We believe there is insufficient information in the BA related to the proposed project description and construction activities, and the direct and indirect effect to listed species that would occur from the project. In addition, the action area used in the evaluation of the BA is unclear. It also appears that species surveys are incomplete, and possibly outdated, and that the best scientific information available has not been used. We recommend TxDOT revise the BA and resubmit it when these issues have been addressed. A complete list of the BA issues the Service is requesting corrections, clarifications, or additional information to be provided was emailed to TxDOT on February 26, 2015.

As a reminder, the Act requires that the Federal action agency may not make any irreversible or irretrievable commitment of resources that limit project options before the final Biological Opinion is completed. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued

existence of endangered or threatened species or destroying or modifying their designated critical habitat.

If you have any questions or comments, please contact Darren LeBlanc at 512-490-0057 (ext. 247) or 512-608-7591.

Sincerely,

Cliff Schleusner
Acting Field Supervisor
Coastal Ecological Services Field Office

cc: Meghan Pawlowski, TxDOT ENV, Austin, TX (electronic)

Texas Department of Transportation

125 EAST 11TH STREET, AUSTIN, TEXAS 78701-2483 | 512.463.8588 | WWW.TXDOT.GOV

March 31, 2016

Mr. Darren LeBlanc
United States Fish and Wildlife Service
10711 Burnet Road, Suite 200
Austin, Texas 78758

RE: Formal Consultation
SH 211 – From FM 1957 to FM 471
CSJ: 3544-03-002, 3544-05-001, 3544-04-002, 3544-06-001
Bexar and Medina Counties, Texas

Dear Mr. LeBlanc:

With this letter and enclosed Biological Assessment (BA), the Texas Department of Transportation (TxDOT) requests to initiate formal consultation under Section 7(a)(4) of the Endangered Species Act (ESA) pursuant to the 2014 FHWA-TxDOT MOU[1].

TxDOT previously sent a draft of this BA to the Service on 1/30/15 and received a request for additional information on 2/25/15. TxDOT then submitted a revised version of the BA to the Service on 11/16/15 and received additional comments on 12/22/15. The revised BA included herein responds to the latest comments from the Service and includes a comment matrix showing how these latest comments were addressed. If you have any questions regarding this, please contact Andy Blair at (512) 416-2645 or Ricardo Flores in our San Antonio District at (210) 615-6486.

Sincerely,

Jodi Bechtel
Director of Natural Resources Management Section
Environmental Affairs Division

[1] Memorandum of Understanding between the Federal Highway Administration and the Texas Department of Transportation concerning state of Texas' participation in the project delivery program pursuant to 23 U.S.C. 327, December 2014

Texas Department of Transportation

125 EAST 11TH STREET, AUSTIN, TEXAS 78701-2483 | 512.463.8588 | WWW.TXDOT.GOV

August 9, 2016

Mr. Darren Le Blanc
U.S. Fish and Wildlife Service
Austin Ecological Services Field Office
10711 Burnet Road, Suite 200
Austin, Texas 78758-4460

Re: SH 211 BA and Karst Preserve Management Plan
Response to Comments

Dear Mr. Le Blanc:

The following is a response to the comments from your office dated June 9, 2016, regarding the SH 211 Biological Assessment (BA) and Karst Preserve Management Plan for the above-referenced project. As per our phone conference on June 13, 2016, we have prepared this letter as an addendum to the SH 211 BA, including a preserve exhibit and revised letter from City Public Service (CPS). It is our intent to address the Service's comments to your satisfaction to ensure the utmost benefit to the species and we welcome any communication from you as we move through the formal Section 7 process.

Responses to USFWS Comments on the BA are listed below after each comment from the June 9 letter.

<u>Service comment:</u>

1. The BA notes that 2.52 acres of CHU 26 would be directly impacted by the roadway construction and that a little more than 10 acres of CHU 26 occurs in the proposed ROW for SH 211. What is not accounted for is the acreage of CHU 26 on the east side of SH 211. This portion of the CHU will be completely separated from Max and Roberts Cave by the roadway. The Service does not agree with your determination that the roadway will have no adverse effects to the physical and biological features (PBF) associated with CHU 26. With only 31 acres of CHU 26 to be protected within the proposed 40 acre karst preserve, and a portion of that area crossed by a CPS utility easement, we are concerned that the PBFs within about 65 acres of the CHU would be adversely affected to some degree. We believe the proposed project would result in alteration of the CHU PBFs by one or more ways listed below:

   - modification of the predator/prey relationship;
   - alteration or contamination of water entering the caves;
   - change the temperature or humidity in the caves;
   - introduction of non-native or invasive species;
   - reduction of nutrient input into the caves;
   - alteration of the native plant and animal surface community; and,

- contamination from road runoff during and after construction, including accidental chemical spills.

Response:

TxDOT addressed the above items in the May 2016 Biological Assessment primarily as they pertain to the core habitat area around Max and Robert's caves in CHU 26. The Service requested additional assessment of the impacts from the proposed project, specifically those effects to the area on the east side of the roadway and in relation to the CHU as a whole. To address this comment, we first revisit the habitat elements used by the US Fish and Wildlife Service (USFWS) to define the PBF (physical and biological features) in each CHU in the final rule designating critical habitat for the Bexar County Karst Invertebrates (77 FR February 14, 2012):

"(1) We identified all areas known to be occupied by the species. We used verified identifications of specimens by recognized species experts. In the case of Madla Cave meshweaver, we also used genetic identification (Paquin and Hedin 2004, p. 3244).
(2) We included the cave footprint with the surface and subsurface drainage areas of the cave, where known.
(3) We included a cave cricket foraging area that is a 344-ft (105-m) circle around the cave entrance (Taylor *et al.* 2005, p. 97).
(4) We also included an area of at least 100 ac (40 ha) around the cave footprint of undisturbed or restorable vegetation as recommended by the Bexar County Karst Invertebrates Recovery Team (Recovery Team) (Service 2008, pp. B1–5). The Recovery Team used an expert opinion poll to query members about species conservation needs, relying on goals identified by the recovery team for maintaining a healthy karst ecosystem for the nine invertebrates. Recovery Team members ranked a preserve size of 60 to 90 ac (16 to 36 ha) with the occupied karst feature near its center as having the highest probability of achieving each goal. Specified goals included maintaining high humidity, stable temperatures, high water quality of surface and subsurface drainage basins, and good connectivity with mesocaverns for population dynamics of troglobites. The Preserve Design Recommendations document cited in the final recovery plan increased the preserve size to a minimum of 100 ac (40 ha) for a high quality KFA based on peer-review comments."

Given that the project is not conducting any activities in the 59 acres of the CHU on the east side of the road, and studies have been carried out that establish the 40 acres around Max and Roberts caves include items 2 and 3 above (with CPS participation), the proposed project would have only a minor adverse effect on CHU 26. Potential negative effects to CHU 26 as a result of the roadway construction include a potential reduction in the number of mammals that frequent the cave that may have home ranges in the expanded area, and other potential edge effects associated with vegetation removal next to the preserve. The roughly 30-acre surface drainage area and surrounding vegetation provide detritus and debris into the caves during rain events that serve as a major source of nutrient input. The remainder of the 100 acres of CHU 26 outside the surface drainage area would potentially contribute nutrient load to the cave via animal dispersal. Construction of the road would divide the surface vegetation within the 100 acre CHU area. Item 4 above includes additional acreage in the CHU to conserve mesocavernous spaces and surface vegetation out to 100 acres. Voluntary conservation measures that TxDOT has proposed to minimize impacts to karst invertebrates and critical habitat prohibit excavation into the subsurface environment and mesocaverns within the CHU, leaving the subsurface PBFs intact.

Service comment:

2. Please make sure the Appendices include the most current project or survey information and are specifically related to the SH 211 project.

Response: The report in the BA appendix includes the current survey of the entire study area for SH 211.

Service comment:

3. The Service considers the proposed 40-acre preserve surrounding Max and Roberts Cave as a conservation measure to offset the impacts to that feature, as well as the PBFs that make up CHU 26. Because there are no additional conservation measures proposed to compensate for direct and indirect effects to *R. infernalis* or *C. venii* outside of Max and Roberts Cave and Feature S-99, TxDOT must complete species surveys, in accordance with current Service protocols, for any new karst features discovered during construction of SH 211 that contain karst habitat. In addition, if a listed species is discovered in any surveyed feature, construction on the remainder of the project, except the portion in karst zone 5, must be halted pending reinitiation of formal consultation with the Service and revision of the incidental take authorization for the project. The Service may consider blanket take coverage for the entire project if additional conservation measures, such as participation in the SEP, or avoidance/minimization, such as reducing the amount of surface excavation needed for construction, are implemented.

Response: The Service states that the surveys are needed "[b]ecause there are no additional conservation measures proposed to compensate for direct and indirect effects to R. infernalis or C. Venii outside of Max and Roberts Cave and Feature S-99." Federal action agencies are not required to "compensate for direct and indirect effects" of their actions. Rather, they are required to ensure their actions do not jeopardize protected species or destroy or adversely modify critical habitat. TxDOT has proposed several measures to avoid and minimize impacts of the project and ensure the threshold of jeopardy or adverse modification of critical habitat is not reached (discussed further below).

In addition, the imposition of a requirement to survey in accordance with the Service's protocol cannot be considered a "reasonable and prudent measure" permissibly required as part of an incidental take statement. 50 C.F.R. §402.14(i). Reasonable and prudent measures may not alter the "duration" of the action. 50 C.F.R. §402.14(i)(2). Conducting surveys under the Service's protocol for any karst features discovered during construction would almost certainly alter the duration of the construction schedule.

A requirement that construction be halted if individuals of listed species are encountered during construction would also not meet the definition of a "reasonable and prudent measure," and would defeat a primary purpose of formal consultation. Under Section 7 and the Service's implementing rules, Section 7 consultation is intended to determine whether a federal action would jeopardize the continued existence of a species or result in adverse modification of critical habitat, and if not, allow the federal action to proceed, even if it results in incidental take of one or more individuals. The Service, therefore, must make the determinations required of it by its rules, and, unless it finds jeopardy or adverse modification, accept that there may be some degree of incidental take. It is understood that

the Service's rules do provide for reinitiation of formal consultation under certain circumstances, but encountering an individual of a listed species during construction is not one of them. 50 C.F.R. §402.16. If it were, then all federal actions with incidental take statements would have to stop and reinitiate consultation whenever an individual of a listed species is encountered during construction, which, again, would defeat the very purpose of Section 7 consultation.

Further, consider that TxDOT has, in fact, proposed implementing voluntary conservation measures to minimize subsurface excavation needed for construction. The proposed project prohibits excavation in KZ 1 (areas known to contain listed karst invertebrates) and CH, avoids all known caves with at least a buffer of 105 meters, and provides a recovery level preserve in CHU 26 and a permanent setback around S-99. As a further minimization measure, subsurface excavation in KZ2 would be minimized and limited to shallow depths (no more than 18 inches). No known occupied karst features would be directly affected with the exception of a small amount of cricket forage area (5% or 0.43 acres as stated in the BA) around feature S-99. This potential impact is proposed to be offset by a 9-acre setback that is linked by the 100-year floodplain to another cave setback on the east side of SH 211 (See attached exhibit). The project proposes subsurface excavation within only a minimal amount of KZ 2 (Areas likely to contain listed karst invertebrates) and only areas of KZ 3 (areas not likely to contain listed karst invertebrates) where there are thick farmland soils and no identified caves or features.

Given the difficulty of estimating the number of invertebrates that may be impacted during construction, TxDOT requests incidental take coverage expressed as a surrogate of 22.99 acres within KZ 2 and 143 acres in KZ 3 for the proposed project, if the Service agrees based on your analysis that this surrogate covers the anticipated take. If project area excavation is to exceed this areal extent, re-initiation of consultation under Section 7 would be warranted.

The May 2015 amendment to the ESA regarding reasonable certainty, and using surrogates in incidental take statements (80 FR May 11, 2015) recommends monitoring for the purpose of documenting impacts to the species when surrogates are utilized. While protocol biota surveys would not provide a direct measure the areal extent of incidental take (expressed in terms of acreage), TxDOT proposes to document voids encountered during construction by mapping voids, collecting temperature and humidity data, evaluating voids for potential to contain karst invertebrate habitat, conducting a biota survey or baiting survey and sealing voids per TCEQ-approved methods. This evaluation should take no longer than 7 days as with the Regional HCP approved construction period measures.

<u>KPMP comments:</u>

- CPS Energy holds a Utility Easement extending through a portion of the proposed 40 acre Max and Roberts Karst Preserve. A description of the easement and map indicating its location in relation to the 40-acre Max and Roberts preserve and nine acre Feature S-99 preserve must be included in the KMPM and BA. The CPS easement allows them the right to remove "all trees, and parts thereof, and any vegetation or obstructions" which they deem as interfering with their utility lines or appurtenances. In order to consider the Max and Roberts preserve as adequate compensation for the proposed road impacts to CHU 26, the entire 40 acres must be preserved in perpetuity and managed in accordance with our Guidelines. CPS

must agree, in writing, to not conduct any future vegetation management within the preserve area, without receiving advance approval from the Service. In addition, CPS must agree to allow all proposed karst habitat management actions to occur within their easement area. *CPS, via TxDOT, submitted a letter to the Service on June 6, 2016, regarding management activities within the portion of their utility easement which passes through the proposed Max and Roberts preserve. Nothing in that report changes the requirements addressed above. In addition, CPS proposes that the conservation value of their utility easement portion of the Max and Roberts preserve be reserved for the benefit of CPS Energy on a future project or consultation. This would not be consistent with TxDOT providing adequate compensation for the adverse effects SH 211's construction and operation would cause to the PBFs of CHU 26.

Response: CPS will provide a letter regarding the future vegetation management in the easement requiring Service approval. The letter provided does include language submitting to the karst preserve management activities. The request for conservation credit from CPS contribution is caveated in the letter in acknowledgement that the Service would only grant credit to CPS in proportion to CPS Energy's commitment, leaving the purchase of the property and management activities TxDOT's commitment and voluntary conservation measures under the current Section 7. The preserve area is expanded to incorporate an additional 1.325 acres (25% of the acreage of the 5.3 acre CPS easement over Max and Robert's preserve) (See attached exhibit). A figure showing the utility easement has also been included in the KPMP.

<u>The remaining comments have been addressed in the KPMP reports.</u>

- 2.1 The proposed red-imported fire ant (RIFA) control does not match our guidelines. The karst preserve areas must be fully inspected on a monthly basis in perpetuity. The RIFA infestation threshold within 33-feet of a cave entrance is one RIFA mound. The threshold for RIFA infestation within the remainder of a preserve can be determined by the preserve manager; however, the threshold must be low enough so the local cave cricket population is not reduced. We recommend a threshold of no greater than five mounds per acre. Whenever RIFA thresholds are reached, treatment must occur within one week of the RIFA survey and must continue at least twice monthly until RIFA infestations have decreased below the threshold level. Once RIFA levels are below the threshold, RIFA control must be conducted during spring and fall, regardless of RIFA levels. The number of RIFA mounds encountered and dates of RIFA control implementation must be included in the biannual KPMP monitoring reports.
  Response: The above language was added to the KPMP.

- 2.2 We do not recommend the installation of cave gates at Max and Roberts Caves or Feature S-99. If cave gates are installed they must be installed in accordance with design recommendations from Bat Conservation International and the American Cave Conservation Association. The KPMP does not state timeframe for the installation of cave gates on the entrances to Max and Roberts Caves or Feature S-99. Cave gates must be inspected monthly.
  Response: All cave gates installed will be in accordance with design recommendations from Bat Conservation International and the American Cave Conservation Association. Cave gates will be installed as the preserves and setbacks are established and inspected monthly. The east entrance to Max and Roberts Cave and Feature 99 will have fencing and no cave

gates. The west entrance to Max and Roberts Cave will require a cave gate because the entrance is located in a drainage and if fencing was built through the drainages, the fence would be constantly knocked down by water flow.

- 2.2 While the Guidelines allow for low-security fencing for the perimeter of a preserve, they also require high-security fencing around the sensitive features of a preserve. The fence must be at least 6.5 feet high and designed so that adults and children could not easily climb over or crawl under the fence. We recommend a single high-security fence be constructed around the two entrances to Max and Roberts Caves. Fence design and location must be included in the KPMP and should include figures indicating the location of the fencing, including gate locations. Security fencing and gates must be inspected monthly and any necessary repairs made within 30 days. If unauthorized access or vandalism is noted, the Service should be notified immediately to determine if re-initiation of consultation is necessary.
  Response: A high-security fence will be built around the east entrance to Max and Roberts Cave and Feature 99. Due to draining issues destroying fencing, the west entrance to Max and Roberts Cave will require a cave gate. A figure has been added to the KPMP.

- 2.3 The Vegetation Management section should include a statement that no pesticides or herbicides would be used within any karst preserve boundary without prior approval of the Service. The proposed twice yearly vegetation monitoring (spring and fall) must be conducted during the same timeframe (i.e., first two weeks of May and October) each year and specified in the KPMP. A baseline vegetation monitoring survey must be completed prior to the initiation of project construction. The vegetation management section must include measurable criteria to determine if a revision to the vegetation management plan or the implementation of adaptive management is necessary, based on monitoring results. Any changes to the proposed vegetation management portion of the KPMP must be approved by the Service.
  Response: The above language was added to the KPMP. Vegetation monitoring will occur during the first two weeks of April and October each year.

- 3.1 In-cave monitoring for karst invertebrates must be conducted during the same time period every year in order to make statistical comparisons over time. The month during which in-cave surveys will be conducted must be specified in the KPMP. Measures to indicate success in achieving karst management objectives are listed in the Guidelines and should be incorporated into the KPMP.
  Response: In-cave surveys will occur in February due to the "bad air" that is a problem during most of the year in this area. Measures to indicate success in achieving karst management objectives were added to this section.

- 3.4 Routine inspections of each karst preserve must be conducted monthly and must include the entirety of the karst preserve area.
  Response: The above language was added to the KPMP.

- 4.0 Adaptive management decisions must be based on goals and objectives or measurable success criteria thresholds established before management actions begin. Potential adaptive management actions must also be identified in advance and described, along with how implementation of a particular adaptive management strategy would achieve the described management goals. It should be noted that modification of success criteria is not

adaptive management. Monitoring results should be used to determine the success of management actions in achieving the specified goals or success criteria. Any proposed changes to the KPMP based on adaptive management strategies must be coordinated with the Service for approval in advance of implementation.
Response: Adaptive management actions were identified and added to the KPMP as was the above language.

- 4.0 Monitoring reports for the karst preserves fulfilling the role of project conservation are required to be submitted twice yearly, in January and July. These bi-annual reports should include information on vegetation and species monitoring conducted within the previous 6 months, as well as notes of concern from monthly routine inspections. This reporting requirement is completely separate from the reporting requirements of any 10(a)(1)(A) permit.
Response: Monitoring was changed from annual to bi-annual.

- The conservation easements covering the Max and Roberts 40-acre preserve and the 9-acre Feature 99 preserve must be held by a third party, preferably a non-profit conservation organization, not associated with the SH 211 project or the proposed Stevens Ranch development, to ensure that the requirement s in the conservation easement are carried out and the properties are conserved in perpetuity.
Response: A third party will hold the conservation easements covering the Max and Roberts 40-acre preserve and the 9-acre Feature 99 preserve.

Your prompt attention to this submittal is greatly appreciated. Please do not hesitate to contact our office if you have further questions or require additional information.

Sincerely,

Jodi Bechtel

Jodi Bechtel
Natural Resource Management Section Director
Environmental Affairs Division

Attachments (electronic only): Stevens Ranch Preserves & Setbacks Aerial Exhibit
CPS Energy Additional Assurances for the Preserve Letter

cc: Andy Blair, NRM, TxDOT

Texas Department of Transportation®
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

January 10, 2014

Re: Transmittal of Cox|McLain Environmental Consulting Draft Report: *Intensive Archeological Survey for Addition of Right-of-way along SH 211 Segment 2, Bexar County.* Texas Antiquities Permit No. 6456.

Ms. Pat Mercado-Allinger
Division Director/State Archeologist
Division of Archeology
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711

Dear Ms. Mercado-Allinger:

Attached for your review is a draft report produced by the archeological staff of Cox|McLain Environmental Consulting for a survey of 3.7 acres of additional right-of-way along State Highway (SH) 211 Segment 2, Bexar County, Texas, conducted under Texas Antiquities Permit No. 6456. The report documents that no archeological sites exist within the project's area of potential effects.

A TxDOT archeologist has reviewed the report by Cox|McLain Environmental Consulting and concurs with the results. **TxDOT seeks THC concurrence that**:

1. Per our MOU, no archeological historic properties (36 CFR Part 800.16(1) or State Archeological Landmarks (13 TAC 26.12) are present within the 3.7 acre APE examined by Cox|McLain Environmental Consulting, and none will be affected by the proposed undertaking. There is little likelihood of significant or intact prehistoric or historical archeological sites within the APE and no further archeological investigations are warranted.

2. Since the survey was conducted under an individual THC Antiquities Permit, we are forwarding the draft for your review and processing in partial fulfillment of THC Antiquities Permit No. 6456. TxDOT finds the report acceptable as a draft and pending any final report review comments from your office, we request your concurrence that the report may proceed toward production and that it provides sufficient documentation that the proposed undertaking will have no effect on an archeological historic properties or State Archeological Landmarks.

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA

(2005) and the Memorandum of Understanding between TxDOT and the THC.

Thank you for your consideration of this matter. If you have any questions regarding the report, please contact Principal Investigator Chris Dayton at (512) 338-2223. Please contact me at (512) 416-2505 for all other matters.

Sincerely,

Eric Oksanen, Archeological Studies Program
Environmental Affairs Division

cc w/o attachments: ECOS Project File; Chris Dayton, Cox|McLain Environmental Consulting

Concurrence By:

for: Mark Wolfe, Executive Director and SHPO
Texas Historical Commission

1-13-14
Date

INTENSIVE ARCHEOLOGICAL SURVEY FOR ADDITIONAL RIGHT-OF-WAY ALONG SH 211 SEGMENT 2, BEXAR COUNTY, TEXAS

[DRAFT]

Prepared by
Chris Dayton (Principal Investigator)
Cox | McLain Environmental Consulting, Inc.
6010 Balcones Drive
Suite 210
Austin, TX 78731

For
Pape-Dawson Engineers, Inc.
555 East Ramsey
San Antonio, TX 78216

And
Bexar County Public Works
233 North Pecos Street, Suite 480
San Antonio, TX 78207

And
Texas Department of Transportation Environmental Affairs Division
118 East Riverside
Austin, TX 78704

Under
Texas Antiquities Permit 6456

CSJ: 3544-04-002

Cox | McLain Environmental Consulting, Inc. Archeological Report 042
(CMEC-AR-042)

COX | McLAIN
Environmental Consulting

March 9, 2013

INTENSIVE ARCHEOLOGICAL SURVEY FOR ADDITIONAL RIGHT-OF-WAY ALONG SH 211 SEGMENT 2, BEXAR COUNTY, TEXAS

[DRAFT]

Prepared by
Chris Dayton (Principal Investigator)
Cox | McLain Environmental Consulting, Inc.
6010 Balcones Drive
Suite 210
Austin, TX 78731

For
Pape-Dawson Engineers, Inc.
555 East Ramsey
San Antonio, TX 78216

And
Bexar County Public Works
233 North Pecos Street, Suite 480
San Antonio, TX 78207

And
Texas Department of Transportation Environmental Affairs Division
118 East Riverside
Austin, TX 78704

Under
Texas Antiquities Permit 6456

CSJ: 3544-04-002

DRAFT REPORT ACCEPTABLE
by
for Mark Wolfe
Executive Director, THC
Date 1-13-14
Track#

Cox | McLain Environmental Consulting, Inc. Archeological Report 042
(CMEC-AR-042)

COX | McLAIN
Environmental Consulting

March 9, 2013

Texas Department of Transportation®
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January 24, 2014

Mr. Bryant J. Celestine,
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56
Livingston, TX 77351

RE: CSJ: 3544-02-002 (3544-04-002, 6544-06-001, 3544-05-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location, Section 106 Continuing Consultation; Bexar and Medina Counties, San Antonio District

Dear Mr. Celestine:

The above referenced transportation project is being considered for construction by the Federal Highway Administration (FHWA) and the Texas Department of Transportation (TxDOT). Environmental studies are in the process of being conducted for this project. The purpose of this letter is to contact you in order to continue Section 106 consultation with your Tribe pursuant to stipulations of the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU). The project is located in an area that is of interest to your Tribe.

Section 106 consultation for this project was initiated in August 2001. In March 2008, we continued consultation to present the results of archeological investigations completed and the findings and recommendations regarding sites recorded during the fieldwork. TxDOT determined that no archeological historic properties would be affected by the proposed project and that no further archeological investigation was warranted within the project area of potential effects (APE). No objections or comments were received. Recently, the project APE was changed to include a tapering, lunate-shaped strip of

additional right of way (ROW). We are continuing consultation to provide the results of field investigation conducted within the additional project area and an update to TxDOT findings and recommendations for the project.

The proposed overall project APE would be approximately 18.5 miles. The new ROW, as described above, would be an approximate maximum of 126 feet wide by 0.38 mile long, for a total of approximately 3.7 acres. The maximum depth of impact for this additional area would be approximately 2.0 feet below original ground surface. For the purposes of this cultural resources review, potential impacts are considered within an area that includes the stated APE, as well as a 50-foot lateral buffer to account for potential alterations to the proposed APE included in the final project design. Consultation would be continued if potential impacts extend beyond this buffer, based on the final design. Maps that show the project area are enclosed, as well as a map of the state that indicates the location of Bexar and Medina Counties.

Cox|McLain Environmental Consulting, Inc. (Cox|McLain), under contract to the TxDOT San Antonio District, conducted an archeological survey of the additional ROW. They found no archeological materials or settings suitable to contain intact archeological historic properties within the additional ROW and recommended that no further archeological investigations were required. TxDOT agrees with the findings of the Cox|McLain survey report.

Therefore, TxDOT provides the following findings and recommendations for the proposed project:

- that no archeological historic properties (36 CFR 800.16(l)) would be affected;
- that a buffer zone of 50 feet beyond the APE be considered as part of the cultural resources evaluation;
- that no further archeological investigation is warranted at this time.

According to our Programmatic Agreement under Section 106 of the National Historic Preservation Act, we are writing to request your comments on historic properties of cultural or religious significance to your Tribe that may be affected by the proposed project APE and the area within the above defined buffer. Any comments you may have on the TxDOT recommendation should also be provided. Please provide your comments within 30 days of receipt of this letter. Any comments provided after that time will be addressed to the fullest extent possible. If you do not object with a recommendation of "no historic properties affected," please sign below to indicate your concurrence. In the event that further investigations by our office disclose the presence of archeological deposits, we will contact your Tribe to continue consultation.

Thank you for your attention to this matter. If you have questions, please contact Eric Oksanen (TxDOT Archeologist) at 512/416-2505 (email: Eric.Oksanen@txdot.gov) or me at 512/416-2638 (email: Sharon.Dornheim@txdot.gov). When replying to this

correspondence by US Mail, please ensure that the envelope address includes reference to the Archeological Studies Branch, Environmental Affairs Division.

Sincerely,

Sharon Dornheim

Sharon Dornheim
Staff Archeologist / Consultation Coordinator
Environmental Affairs Division

Concurrence by: _____ Date: _____

Attachments

cc w/attachments:
Ricardo Flores, TxDOT San Antonio District Environmental Coordinator;
Sonya Hernandez, ENV-PD TxDOT;
Eric Oksanen, ENV-ARCH TxDOT;
ENV-ARCH Project File / ENV-ARCH ECOS

The attached letter was sent by Email to the following tribes on January 23, 2014:

Mr. Bryant J. Celestine
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56
Livingston, TX 77351

Mr. Donnie Cabaniss, Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

[emailed to Lindsey Savage]

Mr. Jimmy Arterberry, THPO
Comanche Nation of Oklahoma
Comanche Nation Office of Historic Preservation
P.O. Box 908
Lawton, OK 73502

Ms. Sandra Platero, President
c/o Holly Houghten
Mescalero Apache Tribe
P.O. Box 227
Mescalero, NM 88340

Ms. Terri Parton, President
Wichita and Affiliated Tribes
P.O. Box 729
Anadarko, OK 73005

[copy to Gary McAdams]

Mr. Tarpie Yargee, Chief
Alabama-Quassarte Tribal Town
P.O. Box 187
Wetumka, OK 74883

Mr. Robert Cast, THPO
Caddo Nation of Oklahoma
P.O. Box 487
Binger, OK 73009

Ms. Amie Tah-Bone
Museum Director and NAGPRA Representative
Kiowa Indian Tribe of Oklahoma
P.O. Box 369
Carnegie, OK 73015

Mr. Don Patterson, President
Tonkawa Tribe of Indians of Oklahoma
1 Rush Buffalo Rd
Tonkawa, OK 74653

[emailed to Miranda Myer]

U.S. Department
of Transportation
Federal Highway Administration

FEDERAL HIGHWAY ADMINISTRATION
300 EAST 8TH STREET, RM 826
AUSTIN, TEXAS 78701

Texas Department of Transportation

TEXAS DEPARTMENT OF TRANSPORTATION
125 E. 11th STREET
AUSTIN, TEXAS 78701-2483

January 24, 2014

Mr. Gilbert Salazar, Chairperson
Business Committee
Kickapoo Tribe of Oklahoma
P.O. Box 70
McLoud, OK 74851

RE: CSJ: 3544-02-002 (3544-04-002, 6544-06-001, 3544-05-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location, Section 106 Continuing Consultation; Bexar and Medina Counties, San Antonio District

Dear Mr. Salazar:

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additional right of way (ROW). We are continuing consultation to provide the results of field investigation conducted within the additional project area and an update to TxDOT findings and recommendations for the project.

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Therefore, TxDOT provides the following findings and recommendations for the proposed project:

- that no archeological historic properties (36 CFR 800.16(l)) would be affected;
- that a buffer zone of 50 feet beyond the APE be considered as part of the cultural resources evaluation;
- that no further archeological investigation is warranted at this time.

According to our procedures and at the request of the FHWA under Section 106 of the National Historic Preservation Act, we are writing to request your comments on historic properties of cultural or religious significance to your Tribe that may be affected by the proposed undertaking APE and the area within the above defined buffer. Any comments you may have on the TxDOT recommendation should also be provided. Please provide your comments within 30 days of receipt of this letter. Any comments provided after that time will be addressed to the fullest extent possible. If you do not object with a recommendation "no historic properties affected," please sign below to indicate your concurrence. In the event that further investigations by our office disclose the presence of archeological deposits, we will contact your Tribe to continue consultation.

Thank you for your attention to this matter. If you have questions, please contact Eric Oksanen (TxDOT Archeologist) at 512/416-2505 (email: Eric.Oksanen@txdot.gov) or me at 512/416-2638 (email: Sharon.Dornheim@txdot.gov). When replying to this

correspondence, please ensure that the envelope address includes reference to the Archeological Studies Branch, Environmental Affairs Division.

Sincerely,

Sharon Dornheim

Sharon Dornheim
Staff Archeologist / Consultation Coordinator
Archeological Studies Branch
Environmental Affairs Division

Concurrence by: _____ Date: _____

Attachments

cc w/attachments:
Ricardo Flores, TxDOT San Antonio District Environmental Coordinator;
Sonya Hernandez, ENV-PD TxDOT;
Eric Oksanen, ENV-ARCH TxDOT;
ENV-ARCH Project File / ENV-ARCH ECOS

The attached letter was sent by Email to the following tribes on January 23, 2014:

Mr. Gilbert Salazar, Chairperson
Business Committee
Kickapoo of Oklahoma
P.O. Box 70
McLoud, OK 74851

[emailed to Pamela Wesley]

Mr. Juan Garza, Jr., Chairperson
NAGPRA Coordinator
Kickapoo Traditional Tribe of Texas
HC1 Route, Box 9700
162 Chick Kazen St
Eagle Pass, TX 78852

[emailed to Don Spaulding]

Sharon Dornheim

From: Jimmy Arterberry <jimmya@comanchenation.com>
Sent: Friday, January 24, 2014 4:19 PM
To: Sharon Dornheim
Subject: RE: Texas Department of Transportation Proposed Project, Bexar and Medina Counties

In response to your request, the above referenced project(s) has/have been reviewed by staff of this office. Based on the information provided and a search within the Comanche Nation Site Files, we have determined that there are **no properties** affected by the proposed undertaking(s).
If you require additional information or are in need of further assistance, please contact this office at (580) 595-9960 or 9618.
This review is performed in order to identify and preserve the Comanche Nation and State's cultural heritage, in conjunction with the State Historic Preservation Office.

Jimmy W. Arterberry, THPO
Comanche Nation
P.O. Box 908
Lawton, Oklahoma 73502
(580) 595-9960 or 9618
(580) 595-9733 FAX

This message is intended only for the use of the individuals to which this e-mail is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable laws. If you are not the intended recipient of this e-mail, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately and delete this e-mail from both your "mailbox" and your "trash." Thank you.

From: Sharon Dornheim [Sharon.Dornheim@txdot.gov]
Sent: Friday, January 24, 2014 1:47 PM
To: Jimmy Arterberry
Subject: Texas Department of Transportation Proposed Project, Bexar and Medina Counties

Good afternoon Jimmy,

I hope things have gone well for you this week.

Attached are a letter and maps regarding a proposed project in Bexar and Medina Counties, Texas.

Section 106 Continuing Consultation

CSJ: 3544-02-002 (3544-04-002, 6544-06-001, 3544-05-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location; Bexar and Medina Counties, San Antonio District

The attached PDF document can be accessed using Adobe Reader 9.0. An online free download of the Adobe software is available at the following website:

http://www.adobe.com/products/reader/

Thank you for your attention to this request.

Best regards,

Sharon

Sharon Dornheim
Staff Archeologist / Consultation Coordinator
Technical Services Section
Environmental Affairs Division
Texas Department of Transportation
512-416-2638

This electronic message transmission and any documents, files, graphics, or previous e-mail messages attached to it may contain information that may be legally confidential and/or privileged. The information is intended solely for the individual(s) or entity(s) named above and access by disclosure, copying, distribution, or other use of the contents of this message is prohibited and may be unlawful. If you have received this electronic transmission in error, please reply immediately to the sender pointing out the error, and delete the message. This message may also contain personal opinions of the author and should not be considered as an official TxDOT policy or opinion.

Drink. Drive. Go to Jail.

Sharon Dornheim

From: Robert Cast <rcast@caddonation.org>
Sent: Monday, January 27, 2014 4:05 PM
To: Sharon Dornheim
Subject: Re: Texas Department of Transportation Proposed Project, Bexar and Medina Counties

We concur Sharon...Robert

On 01/24/14, **Sharon Dornheim** <Sharon.Dornheim@txdot.gov> wrote:
Good afternoon Robert,

I hope things have gone well for you this week.

Attached are a letter and maps regarding a proposed project in Bexar and Medina Counties, Texas.

Section 106 Continuing Consultation

CSJ: 3544-02-002 (3544-04-002, 6544-06-001, 3544-05-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location; Bexar and Medina Counties, San Antonio District

The attached PDF document can be accessed using Adobe Reader 9.0. An online free download of the Adobe software is available at the following website:

http://www.adobe.com/products/reader/

Thank you for your attention to this request.

Best regards,

Sharon

Sharon Dornheim

Staff Archeologist / Consultation Coordinator

Technical Services Section

Environmental Affairs Division

Texas Department of Transportation

512-416-2638

This electronic message transmission and any documents, files, graphics, or previous e-mail messages attached to it may contain information that may be legally confidential and/or privileged. The information is intended solely for the individual(s) or entity(s) named above and access by disclosure, copying, distribution, or other use of the contents of this message is prohibited and may be unlawful. If you have received this electronic transmission in error, please reply immediately to the sender pointing out the error, and delete the message. This message may also contain personal opinions of the author and should not be considered as an official TxDOT policy or opinion.

Drink. Drive. Go to Jail.

Kickapoo Tribe of Oklahoma

P.O.Box 70
407 N. Hwy 102
McLoud, Oklahoma 74851

Administration Department
Phone: 405-964-7053; Fax: 405-964-7065
Email: kwilson@kickapootribeofoklahoma.com

RECEIVED - TXDOT
FEB 03 2014
ENVIRONMENTAL

January 29, 2014

Texas Department of Transportation
ATTN: Sharon Dornheim
Staff Archeologist/Consultant Coord.
Archeological Studies Branch
Environmental Affairs Division
125 E. 11th Street
Austin, TX 78701-2483

RE: CSJ: 3544-02-002 (3544-04-002, 6544-06-001, 3544-05-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location; Bexar and Medina Counties; San Antonio District

Dear Mrs. Dornheim:

Thank you for consulting with the Kickapoo Tribe of Oklahoma in regard to the above referenced site(s). At this time, the Kickapoo Tribe of Oklahoma has no objections to the proposed project(s) at the intended site(s). However, in the event burial remains and/or artifacts are discovered during the development or construction process, the Kickapoo Tribe of Oklahoma would ask for immediate notification of such findings.

Should I be of any further assistance, please contact me at (405) 964-4227.

Sincerely,

Kent Collier
NAGPRA Contact
Kickapoo Tribe of Oklahoma

Cc: File

Gilbert Salazar
APETOKA
CHAIRMAN

Boyd Ponkilla
ADAMIDATA
VICE-CHAIRMAN

Patricia Gonzales
MOKITANOCUA
SECRETARY

Jennell Downs
KISAKODICUA
TREASURER

Everett Suke
MOKITANOA
COUNCILMAN

Sharon Dornheim

From: atahbone@kiowatribe.org
Sent: Friday, January 31, 2014 11:03 AM
To: Sharon Dornheim
Subject: RE: Texas Department of Transportation Proposed Project, Bexar and Medina Counties
Attachments: 3544-02-002 1-31-14-signed.pdf

Here is another electronically signed
Amie

-----Original Message-----
From: "Sharon Dornheim" <Sharon.Dornheim@txdot.gov>
Sent: Friday, January 24, 2014 1:46pm
To: "Amie R. Tah-Bone (atahbone@kiowatribe.org)" <atahbone@kiowatribe.org>
Subject: Texas Department of Transportation Proposed Project, Bexar and Medina Counties

Good afternoon Amie,
I hope things have gone well for you this week.
Attached are a letter and maps regarding a proposed project in Bexar and Medina Counties, Texas.
Section 106 Continuing Consultation
CSJ: 3544-02-002 (3544-04-002, 6544-06-001, 3544-05-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location; Bexar and Medina Counties, San Antonio District
The attached PDF document can be accessed using Adobe Reader 9.0. An online free download of the Adobe software is available at the following website:

http://www.adobe.com/products/reader/

Thank you for your attention to this request.
Best regards,
Sharon
Sharon Dornheim
Staff Archeologist / Consultation Coordinator
Technical Services Section
Environmental Affairs Division
Texas Department of Transportation
512-416-2638
This electronic message transmission and any documents, files, graphics, or previous e-mail messages attached to it may contain information that may be legally confidential and/or privileged. The information is intended solely for the individual(s) or entity(s) named above and access by disclosure, copying, distribution, or other use of the contents of this message is prohibited and may be unlawful. If you have received this electronic transmission in error, please reply immediately to the sender pointing out the error, and delete the message. This message may also contain personal opinions of the author and should not be considered as an official TxDOT policy or opinion.
Drink. Drive. Go to Jail.

Kiowa Tribe Museum
P.O. Box 369
Carnegie, Oklahoma 73015
580-654-2300 ext. 370

Texas Department of Transportation
Archeological Studies Branch
Environmental Affairs Division
Dewitt C. Greer State Highway DLDG
125 E. 11th Street
Austin, TX 78701-7483

1/31/14

RE: CSJ:3544-02-02 (3544-04-002, 6544-06-001, 354405-001, 3544-03-003); SH 211, from US 90 to SH 16, Highway on New Location, Section 106 Continuing Consultation; Bexar and Medina Counties, San Antonio District

Dear Ms. Sharon Dornheim,

Thank you for informing the Kiowa Tribe of Oklahoma about the above referenced project. By initiating Section 106 consultation, we are allowed an opportunity to determine the potential effects that a project may have on cultural resources that are important to our tribe.

We made the conclusion of "no historic properties affected." If, however, any additional information becomes available please our assessment may be revised. In the event that any archaeological or historical objects/materials are discovered during this project, the Kiowa Tribe requests that all work ceases, the area is secured, and that the Tribe is immediately notified.

Thank you for initiating the Section 106 consultation process. Any questions or comments regarding our determination of "no historic properties affected" can be forwarded to atahbone@kiowatribe.org or at the above letterhead.

Sincerely,

Amie Tah-Bone

Amie Tah-Bone
Museum Director/NAGPRA Representative
Kiowa Tribe of Oklahoma

1/31/14
Date

Form 1

From:	TxDot
To:	Troy Olney-C; TxDot
Cc:	Sonya Hernandez; Mike Hoke
Subject:	RE: Draft Environmental Assessment Review; CSJ: 3544-03-002; SH 211 From FM 1957 (Potranco Rd.) To FM 471 (Culebra Rd.); Bexar and Medina Counties
Date:	Tuesday, June 17, 2014 3:19:38 PM

The Texas Commission on Environmental Quality (TCEQ) received the Texas Department of Transportation's (TxDOT) request for environmental review of the following project: CSJ: 3544-03-002; SH 211 From FM 1957 (Potranco Rd.) To FM 471 (Culebra Rd.); Bexar and Medina Counties.

In accordance with the Memorandum of Understanding between TxDOT and TCEQ regarding environmental reviews, which is codified in Chapter 43, Subchapter I of the Texas Administrative Code (TAC) and 30 TAC § 7.119, TCEQ is responding to your request for review. TCEQ does not have any comments.

TxDOT will still need to follow all other applicable laws related to this project, including applying for applicable permits.

If you have any questions, please feel free to contact me at (512) 239-4899.

Regards,

Mike Hoke

From: Troy Olney-C [mailto:TOLNEY-C@txdot.gov]
Sent: Wednesday, May 14, 2014 9:23 AM
To: TxDot
Cc: Sonya Hernandez
Subject: Draft Environmental Assessment Review; CSJ: 3544-03-002; SH 211 From FM 1957 (Potranco Rd.) To FM 471 (Culebra Rd.); Bexar and Medina Counties

Hello,

TxDOT requests the TCEQ evaluate the SH 211 project per 43 TAC 2.23. The proposed project would include various improvements to SH 211 from Farm-to-Market
(FM) 1957 (Potranco Road) to FM 471 (Culebra Road) in the City of San Antonio's Extra-Territorial Jurisdiction, Bexar County and Medina County, Texas. We are requesting TCEQ review since the project meets triggers under the new MOU related to projects within the Edwards Aquifer Transition Zone.

An electronic version of the Draft Environmental Assessment will be transmitted to your office using our FTP system.
Please let me know if you have any questions, or if you require any additional information.

Thank you,

Troy Olney
Environmental Affairs Division
Texas Department of Transportation
512-416-2522

TOLNEY-C@txdot.gov

Don't mess with Texas® means don't litter.

Texas Department of Transportation

MEMO
December 2, 2014

To: 850 File, ECOS CSJ: 3544-03-002

From: Renee Benn
Historian, ENV 57

Subject: Internal review under the Programmatic Agreement (PA-TU) among the Federal Highway Administration, Texas State Historic Preservation Officer, Advisory Council on Historic Preservation, and the Texas Department of Transportation; and the Memorandum of Understanding (MOU) between the Texas Historical Commission and the Texas Department of Transportation

---

District: **San Antonio**

County: **Bexar & Medina**

Highway: **SH 211 Segment 2 from FM 471 (Culebra Rd) to FM 1957 (Potranco Rd)**

Let: **2015**

Project Description: Stipulation VI, Appendix 4, construct new roadway, 220 acres new ROW, no historic properties in APE

Project Description:

The TxDOT San Antonio district proposes to construct the last segment of SH 211 between FM 471 and FM 1957 in Bexar and Medina County, Texas. On November 19, 1986, the City of San Antonio's Planning Commission amended the COSA Major Thoroughfare Plan to include State Highway (SH) 211 among a network of roadways planned to address the recent population growth in Western Bexar County. Following the amendment, an EA for the SH 211 project limits from United States Highway (US HWY) 90 to SH 16/Bandera Rd was produced, which analyzed a 4-lane freeway section within 400 feet of typical ROW, and resulted in a Finding of No Significant Impact (FONSI) in 1987. The purchase of right-of-way (ROW) began for the full limits of a project extending from US HWY 90 to SH 16. Two sections of SH 211 from US HWY 90 to FM 1957 and from FM 471 to SH16 were constructed. After acquiring roughly half of the ROW required for SH 211 after the 1987 FONSI, funding lapsed before completion of this final segment of SH 211 between FM 1957 and FM 471.

In an attempt to revive the SH 211 project, the Texas Department of Transportation (TxDOT) initiated additional planning and environmental analysis in 2006. Constraints emerging since the 1987 EA approval included the listing of endangered karst invertebrate species in 2000, the designation of karst invertebrate critical habitat in 2003 and again in 2012, and an increase in the number of historic-age properties due to the passing of time. Investigations associated with the new effort included archeological, historic, as well as endangered species, and a public meeting was held on July 24, 2007.

The 2006 and 2008 historic research survey reports were coordinated with SHPO in 2008 (see attached letter). Again, a shortage of state funding prematurely ended forward motion on design and construction of SH 211.

As a result, over the last 20 years the surrounding area has developed and private development plans have been submitted based on an anticipated alignment between FM 471 and FM 1957. The current project proposal is for a two-lane rural roadway within 150' of ROW. The project would require 220 acres of new ROW, 93 acres of which was purchased after the FONSI of the 1980s.

Efforts to Identify Historic Properties

A review of the National Register of Historic Places (NRHP) the list of State Antiquities Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that no historically significant properties have been previously documented within the area of potential effects (APE). It has been determined through consultation with the State Historic Preservation Officer (SHPO) that the APE for the proposed project is 300' from the proposed right-of-way due to new location. A 2014 historic resources survey report (HRSR) identified one cemetery within the APE- an unnamed cemetery on the Martinez-Padilla-Zimmerle property. Previous HRSRs in 2006 and 2008 identified two eligible properties within the study area for the project.

During the 2014 reconnaissance-level survey, 15 historic-age (pre-1970) resources were identified on six properties. None of the resources identified during this survey were recommended eligible for inclusion in the NRHP. No historic landscapes or previously unrecorded districts were identified because of significant non-historic-age alterations to the resources, surrounding buildings, and neighborhood, resulting in a significant loss of integrity.

The Martinez-Padilla-Zimmerle parcel (#6) is within the APE, but right-of-entry (ROE) for historic survey purposes was not granted. Because new ROW of approximately four acres is required from the property, TxDOT historians obtained a 2006 archeological report for the property, which found ruinous but still standing structures on the property, as well as a cemetery. While a historic-age topographical map shows buildings on the parcel, these are now in ruins and no longer standing, per TxDOT archeologists and a review of aerial photos (see attachments).

Based on the 2006 archeological report, the Martinez-Padilla-Zimmerle cemetery "has recently been fenced and is well maintained. It contains about 25 marked graves. Some graves lack markers, but most are marked with simple wooden crosses made from a picket fence, concrete headstones with names only, and more recent granite markers" (Shafer and Hester 2006: 11). Based on photos provided in the HRSR and discussions with the TxDOT archeologist, it appears the grave markers are primarily non-historic-age. Based on current THC data as well as spatial data obtained from TxDOT engineers, the Martinez-Padilla-Zimmerle cemetery is located approximately 800 feet from the proposed right-of-way.

The cemetery is not associated with important historic events. The cemetery does not contain the graves of a number of exceptionally significant persons. The cemetery does not appear to be of relative great age in this geographic context. The cemetery does not express aesthetic principles of funerary design through the overall plan, landscaping, statuary, sculpture, fencing, buildings or grave markers. Therefore the cemetery on the Martinez-Padilla-Zimmerle property is **not eligible** for NRHP listing under Criteria Consideration D.

Due to lack of integrity of the ruinous resources on the property itself, the Martinez-Padilla-Zimmerle property (#6) does not retain the integrity necessary to convey significance and is therefore determined **not eligible** for inclusion in the NRHP under Criterion A, B or C.

The other properties in the APE consist of single family residential properties, mostly built in the mid-20th century. These ranch houses represent a common building form constructed in large number

using plans created for a mass market. As a result, they are very similar to other ranch style houses in the area, only varying slightly in the use of exterior materials and window, door, and garage placements. Individually, the houses do not retain the integrity necessary to convey their significance and are recommended not eligible for inclusion in the NRHP.

In addition, these resources and their outbuildings no longer retain the integrity necessary to convey their significance. None of the outbuildings were found to represent a unique style or method of construction and often pre-date the main ranch-style house. Collectively, the buildings on the individual properties have undergone significant alterations resulting in loss of integrity such that the area is recommended not eligible for inclusion in the NRHP as a historic district or rural historic landscape. Properties 3-5 were coordinated in previous reviews of this project and determined not eligible for NRHP listing in 2008 (see SHPO letter attached to HRSR). Properties 1-5 are **not eligible** for NRHP listing under any criteria.

Determination of Effects:

Pursuant to Stipulation VI, Appendix 4 "Undertakings with Potential to Cause Effects" of the First Amended Programmatic Agreement for Transportation Undertakings, (PA-TU) between the Federal Highway Administration (FHWA), the Texas State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and the Texas Department of Transportation (TxDOT) and the Memorandum of Understanding (MOU), TxDOT Historians determined that no historic properties are present. Therefore, individual project coordination with SHPO is not required.

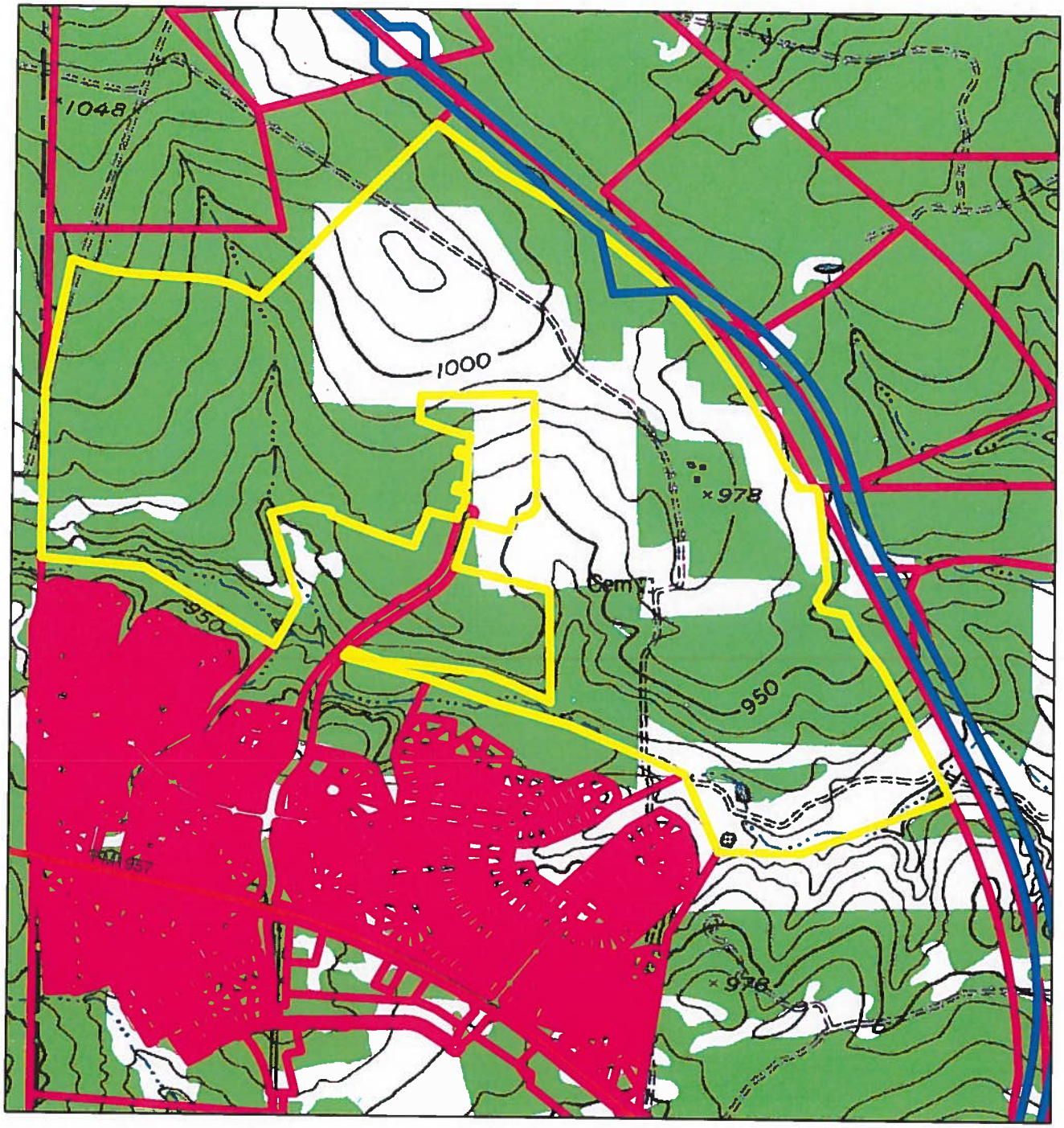
Lead Reviewer MdS for TxDOT 12/2/2014
Mario Sanchez Date

Approved by for TxDOT 12.5.14
Bruce Jensen Date

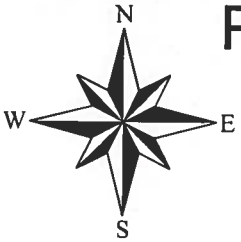
cc: Ricardo Flores, San Antonio District via ECOS

Sonya Hernandez, ENV-PM via ECOS

Linda Henderson, SHPO



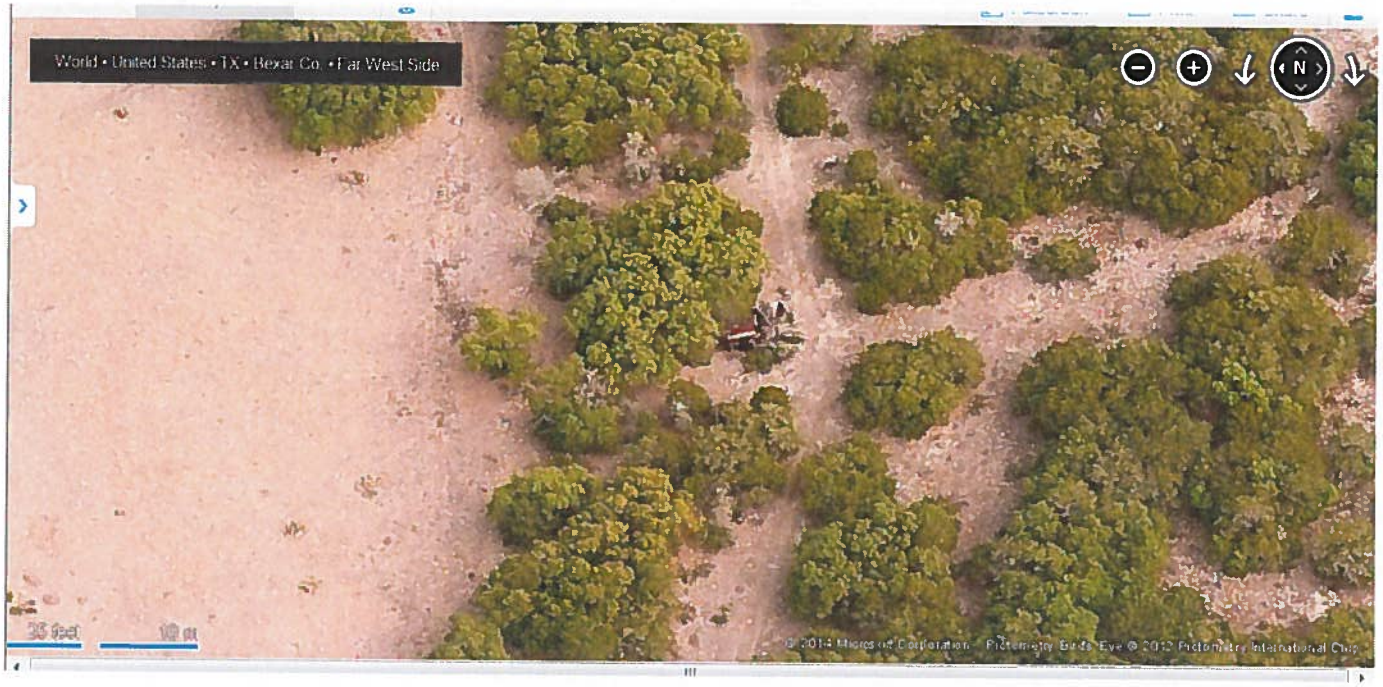
Location of ROW and cemetery Martinez-Padilla-Zimmerle parcel Property #6 (yellow)



Legend

- SH 211 ROW
- Parcel boundaries
- Property #6 boundaries
- TxDOT_Owned_Roads

0 1,100 2,200 4,400 6,600 8,800 Feet



Ruined structure on Martinez-Padilla-Zimmerle parcel, view east

Troy Olney-C

From: TxDot <TxDot@tceq.texas.gov>
Sent: Tuesday, June 17, 2014 3:19 PM
To: Troy Olney-C; TxDot
Cc: Sonya Hernandez; Mike Hoke
Subject: RE: Draft Environmental Assessment Review; CSJ: 3544-03-002; SH 211 From FM 1957 (Potranco Rd.) To FM 471 (Culebra Rd.); Bexar and Medina Counties

The Texas Commission on Environmental Quality (TCEQ) received the Texas Department of Transportation's (TxDOT) request for environmental review of the following project: CSJ: 3544-03-002; SH 211 From FM 1957 (Potranco Rd.) To FM 471 (Culebra Rd.); Bexar and Medina Counties.

In accordance with the Memorandum of Understanding between TxDOT and TCEQ regarding environmental reviews, which is codified in Chapter 43, Subchapter I of the Texas Administrative Code (TAC) and 30 TAC § 7.119, TCEQ is responding to your request for review. TCEQ does not have any comments.

TxDOT will still need to follow all other applicable laws related to this project, including applying for applicable permits.

If you have any questions, please feel free to contact me at (512) 239-4899.

Regards,

Mike Hoke

From: Troy Olney-C [mailto:TOLNEY-C@txdot.gov]
Sent: Wednesday, May 14, 2014 9:23 AM
To: TxDot
Cc: Sonya Hernandez
Subject: Draft Environmental Assessment Review; CSJ: 3544-03-002; SH 211 From FM 1957 (Potranco Rd.) To FM 471 (Culebra Rd.); Bexar and Medina Counties

Hello,

TxDOT requests the TCEQ evaluate the SH 211 project per 43 TAC 2.23. The proposed project would include various improvements to SH 211 from Farm-to-Market
(FM) 1957 (Potranco Road) to FM 471 (Culebra Road) in the City of San Antonio's Extra-Territorial Jurisdiction, Bexar County and Medina County, Texas. We are requesting TCEQ review since the project meets triggers under the new MOU related to projects within the Edwards Aquifer Transition Zone.

An electronic version of the Draft Environmental Assessment will be transmitted to your office using our FTP system. Please let me know if you have any questions, or if you require any additional information.

Thank you,

Troy Olney
Environmental Affairs Division
Texas Department of Transportation
512-416-2522
TOLNEY-C@txdot.gov

Don't mess with Texas® means don't litter.

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 10/11/13	4. Sheet 1 of 2
1. Name of Project SH 211	5. Federal Agency Involved FHWA	
2. Type of Project Linear Transportation Improvement	6. County and State Bexar and Medina County, Texas	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated None	Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*		Alternative Corridor For Segment _____			
		Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		21	21	25	25
B. Total Acres To Be Converted Indirectly, Or To Receive Services		0	0	0	0
C. Total Acres In Corridor		62.16	25.79	62.16	62.16
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland		21	21	25	20
B. Total Acres Statewide And Local Important Farmland		0	0	0	0
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0	0	0	0
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		0	0	0	0
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*					
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	10	10	10	10
2. Perimeter in Nonurban Use	10	8	8	8	8
3. Percent Of Corridor Being Farmed	20	8	8	8	8
4. Protection Provided By State And Local Government	20	20	20	20	20
5. Size of Present Farm Unit Compared To Average	10	0	0	0	0
6. Creation Of Nonfarmable Farmland	25	0	0	0	0
7. Availablility Of Farm Support Services	5	5	5	5	5
8. On-Farm Investments	20	0	0	0	0
9. Effects Of Conversion On Farm Support Services	25	0	0	0	0
10. Compatibility With Existing Agricultural Use	10	0	0	0	0
TOTAL CORRIDOR ASSESSMENT POINTS	160	51	51	51	51
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	51	51	51	51
TOTAL POINTS *(Total of above 2 lines)*	260	51	51	51	51

1. Corridor Selected: A	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☑

5. Reason For Selection:

Site A - ROW maximum (150' ROW)

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ?
(Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

Ricardo Flores

From: Russell Hooten <Russell.Hooten@tpwd.texas.gov>
Sent: Friday, October 31, 2014 4:05 PM
To: Ricardo Flores
Cc: Russell Hooten
Subject: RE: SH 211 CSJ 3544-03-002

Hi Ricardo,

Thank you for coordinating the SH 211 new location project in San Antonio from FM 1957 (Potranco Road) to FM 471 (Culebra Road) (CSJ 3544-03-002, et al). TPWD recommendations are as follows:

1. Construction access and staging areas within the existing and new ROW will be located in areas that minimize the clearing of wooded habitats.
2. Staging areas will be located in upland areas away from drainages to avoid and/or minimize the potential impacts of accidental fuel or chemical spills or leaks on karst features.

It is TPWD's understanding that the EA has commitments as follows:

1. TxDOT will include notes in the EPIC sheets for the developer/contractor to minimize clearing of native vegetation including wooded areas within the existing and proposed ROW.
2. After completion of construction, disturbed areas will be reseeded with native grasses.
3. Bird BMPs will be applied.
4. Bridge bat BMPs and cliff/cave bat BMPs will be implemented for the cave myotis bat.
5. Reptile BMPs will be applied. Contractors would cover excavated pits or trenches overnight to prevent trapping Texas tortoises and other small wildlife and visually inspect trenches before filling to avoid burial of the species.
6. The contractors will be advised of the potential presence of the plains spotted skunk, spot-tailed earless lizard, Texas garter snake, Texas indigo snake, and Texas tortoise and avoid harming these species if encountered, and avoid unnecessary impacts to dens or other suitable habitat in which these species may occur.

Please confirm that TxDOT's commitments are correctly identified above and respond to indicate whether TxDOT can commit to implementing the additional recommendations provided.

Thank you,

Russell

Russell Hooten
Wildlife Habitat Assessment Program
TPWD-Wildlife Division
6300 Ocean Drive, NRC 2501
Unit 5846
Corpus Christi, TX 78412
361-825-3240 Office
russell.hooten@tpwd.texas.gov **(Note new email address)**

From: Ricardo Flores [mailto:Ricardo.Flores@txdot.gov]
Sent: Wednesday, October 29, 2014 4:28 PM
To: Russell Hooten
Subject: RE: SH 211 CSJ 3544-03-002

Hi Russell,

Can you forward me the response to this coordination.

Thanks.

Ricardo

From: Russell Hooten [mailto:Russell.Hooten@tpwd.texas.gov]
Sent: Wednesday, July 23, 2014 11:06 AM
To: Ricardo Flores
Subject: RE: SH 211 CSJ 3544-03-002

Hi Ricardo,

Yes, I remember this project and unburied it from my stack of projects last month, downloaded the draft EA from ECOS and started to read through it and then got sidetracked again. Your email has prompted me to put it back on top of the stack so I will get to it and get a response to you most likely by the middle of next week. I may have some questions after I get back into the EA.

By the way, as you may already know, as part of the MOU, we now have a TxDOT liaison at TPWD that will handle all NEW TxDOT projects. Since we already started coordination on this one I will be the one finishing it. But in the future, all projects should be submitted to the WHAB_TxDOT email address (WHAB_TxDOT@tpwd.texas.gov) for coordination. I still may be involved in some larger projects or ones that have a long history, but for the most part our new person, Sue Reilly, will be handling TxDOT projects.

Thanks,
Russell

From: Ricardo Flores [mailto:Ricardo.Flores@txdot.gov]
Sent: Wednesday, July 23, 2014 9:54 AM
To: Russell Hooten
Subject: FW: SH 211 CSJ 3544-03-002

Hi Russell,

Long time no talk. I forwarded the abovementioned information to you and to "WHAB" back in February and I have not received a response. This is the first coordination that I have done under our new MOU so I don't know what needs to happen next. A draft EA is in ECOS if you need to review it.

Ricardo Flores
Texas Department of Transportation
San Antonio District
210.615.6486

From: Ricardo Flores
Sent: Wednesday, February 05, 2014 3:56 PM

To: 'WHAB_TxDOT@tpwd.texas.gov'
Cc: 'russell.hooten@tpwd.texas.gov'
Subject: SH 211 CSJ 3544-03-002

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