
Oak Hill Parkway
Biological Resources
Technical Report
Addendum



OAK HILL
P A R K W A Y

U.S. Highway 290 (US 290) / State
Highway (SH) 71 West from State Loop 1
(Mopac) to West of Ranch-to-Market (RM)
1826 and US 290 to Silvermine Drive

Travis County, Texas

CSJ # 0113-08-060 and 0700-03-077

May 2019



The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.



TABLE OF CONTENTS

| | | |
|------------|---|-----------|
| 1. | Introduction | 4 |
| 1.1 | 2019 Reevaluation | 4 |
| 2. | General Description of the Oak Hill Parkway Project Area | 4 |
| 2.1 | Natural Setting | 4 |
| 2.2 | Land Use | 5 |
| 3. | Geology and Soils..... | 5 |
| 3.1 | Geology | 5 |
| 3.2 | Soils | 7 |
| 4. | Water Resources..... | 7 |
| 5. | Vegetation | 8 |
| 5.1 | Vegetation Impacts | 9 |
| 5.2 | Unusual Vegetation and Special Habitat Features..... | 10 |
| 6. | Fish and Wildlife Resources | 11 |
| 6.1 | Migratory Bird Treaty Act | 12 |
| 6.2 | Bald and Golden Eagle Protection Act..... | 13 |
| 6.3 | Executive Order 13112 on Invasive Species | 13 |
| 6.4 | Executive Memorandum on Beneficial Landscaping | 13 |
| 6.5 | Farmland Protection Policy Act (FPPA) | 13 |
| 6.6 | Fish and Wildlife Coordination Act..... | 14 |
| 6.7 | Coastal Regulations..... | 14 |
| 6.8 | Endangered Species Act..... | 14 |
| 7. | Habitat for Threatened or Endangered Species | 14 |
| 7.1 | Federally-Listed Species..... | 36 |
| 7.2 | State-Listed Species | 37 |
| 7.3 | Species of Greatest Conservation Need | 38 |
| 8. | Preserve and Conservation Lands..... | 39 |
| 9. | Texas Parks and Wildlife Coordination..... | 39 |
| 10. | Conclusions | 42 |
| 11. | References | 44 |

LIST OF TABLES

| | |
|--|----|
| Table 1: Soils within the Oak Hill Parkway Project Area | 7 |
| Table 2: Impacts to Observed Vegetation Types..... | 10 |
| Table 3: Observed Avian Species..... | 12 |
| Table 4: Threatened, Endangered, and Species of Greatest Conservation Need of Potential Occurrence in Travis County, Texas..... | 16 |
| Table 5: Results from Review of the Texas Natural Diversity Database | 36 |
| Table 6: BMPs for State-Listed Species and SGCNs | 39 |

ATTACHMENTS

- Attachment A: Figures
- Attachment B: Project Area Photographs
- Attachment C: County Lists

FIGURES

- Figure 1: Project Location (Aerial Base)
- Figure 2: Project Location (Topographic Base)
- Figure 3: Right-of-Entry
- Figure 4: Project Area Geology
- Figure 5: Geologic Features and Karst Zones
- Figure 6: Project Area Soils
- Figure 7a-b: Water Resources
- Figure 8a-h: Observed Vegetation Types
- Figure 9: TXNDD Elements of Occurrence

1. INTRODUCTION

In December 2018, the Texas Department of Transportation (TxDOT) approved a Final Environmental Impact Statement (EIS) and Record of Decision (ROD) for mobility improvements to U.S. Highway (US) 290/State Highway (SH) 71 West from State Loop 1 (MoPac) to west of Ranch-to-Market Road (RM) 1826 and from US 290 to Silvermine Drive (**Figure 1**). The proposed project, known as the Oak Hill Parkway (OHP) Project, is located in Travis County, Texas, and is shown on the USGS 7.5' quadrangle maps for *Bee Cave*, *Oak Hill*, and *Signal Hill, Texas* (**Figure 2**).

The proposed OHP Project and previous environmental analyses are described in detail in the Final EIS and ROD (available online at <https://www.oakhillparkway.com/environmental/final-impact.php>).

1.1 2019 Reevaluation

As a result of project design changes following the 2018 ROD, TxDOT is conducting a documented reevaluation to determine whether or not the previous environmental decision remains valid under circumstances listed in 43 TAC 2.85 and 23 CFR 771.129. The proposed design changes would require additional right-of-way for utility relocations and would lengthen and realign the shared-use path to minimize impacts to protected trees. There would be no change to project limits. A detailed list of design revisions is included in the Documented Reevaluation Checklist and displayed on the revised schematics (available for review at the TxDOT Austin District Office). This Biological Resources Technical Addendum has been prepared to document new ecological impacts resulting from the 2019 design changes. Additionally, this addendum includes the results of field investigations conducted along portions of the proposed right-of-way where access to previously unsurveyed parcels (approximately 42 acres) has been granted (**Figure 3**). This includes several commercial, residential, and undeveloped parcels along US 290 and SH 71. Additionally, in 2019 access was granted to the two upstream detention ponds: Pond 1 – located west of SH 71 and Pond 2 – located east of SH 71 along Old Bee Caves Road. As of May 2019, approximately 29 acres within the OHP Project area remain to be surveyed.

2. GENERAL DESCRIPTION OF THE OAK HILL PARKWAY PROJECT AREA

2.1 Natural Setting

The proposed project is located in the Edwards Plateau Natural Region of Texas (Gould, 1960). The Edwards Plateau is an uplifted ecological region of Central Texas characterized by thin top soils and rolling hills of sandstone, limestone, and shales. Elevations within this region range from 100 feet to 3,000 feet above mean sea level, and the topography is bisected by several river systems, which create a well-drained landscape. Historically a grassland savannah, the Edwards Plateau once supported a diverse assemblage of grasses and forbs with a juniper-oak woodland overstory.

The vegetation and geology of the Edwards Plateau define the distinctiveness of the wildlife community found within this region. The limestone hills and corresponding subterranean systems support an array of species that are endemic to this region. The Edwards Plateau ecoregion also provides habitat for a wide range of reptile, mammal, and avifauna species that are common to the

Central Texas environment. However, agricultural practices, grazing operations, and development have transformed the vegetation community in much of this region into a landscape dominated by native-invasive plants (TPWD, 2017). The natural setting remains the same as that described in the Final EIS.

2.2 Land Use

The proposed project area is located in a primarily urban area. Both commercial and residential structures exist adjacent to the project corridor (**Attachment B, Photos 1 – 4, 25, and 29**). Several parcels adjacent to the US 290 and SH 71 roadways are vacant, vegetated lots, which contain disturbed oak-juniper and native-invasive woodland vegetation (**Photos 5 – 8, 18 – 20, 30, 31, and 33**). Undeveloped land is fragmented throughout the project area and includes riparian channels around creek crossings, limestone outcrops, and wooded areas (**Photos 9 – 13, 16 – 17, 21 – 22, 26 – 27 and 31**). The proposed stormwater detention pond locations are a mixture of native and introduced vegetation surrounded by residential and commercial land. The proposed detention pond site located west of SH 71 (Pond 1) is currently being used for livestock grazing (**Photos 23 and 28**). The proposed detention pond site located east of SH 71 and adjacent to Old Bee Caves Road (Pond 2) is currently undeveloped, vegetated land that is transected by a sewer line and relic irrigation infrastructure (sprinkler system) (**Photos 35 - 36**). Although there have been additional commercial and residential developments along US 290/SH 71, land use along OHP Project corridor has not significantly changed since the 2018 EIS and ROD.

3. GEOLOGY AND SOILS

3.1 Geology

The geology of the project area is a typical representation of karst topography (eroded limestone) in Central Texas. Two bedrock formations underlie the project area (**Figure 4**). At the intersection between these two formations lies the Mount Bonnell Fault. West of the Mount Bonnell Fault lies the Upper Glen Rose Limestone formation which forms the stair-step topography that characterizes the Texas Hill Country region (TNRIS, 2007; Ward, 2006). East of the Mount Bonnell fault lies the Fredericksburg Group of the Edwards Formation. The project area geology remains the same as that described in the Final EIS.

As discussed in the Final EIS and associated technical reports, the OHP Project corridor crosses Karst Zone 3 (east from the intersection of William Cannon to the project terminus at Mopac) and Karst Zone 4 (west from the intersection of William Cannon to the project termini on US 290 and SH 71). The area mapped as Karst Zone 3 is located within the South Travis Karst Fauna Region (KFR) (**Figure 5**). The U.S. Fish and Wildlife Service (USFWS) developed KFRs to delineate the geologic and structural controls that restrict the current distribution of troglobitic fauna in karst areas (White et al, 2001)). Although the project occurs within the South Travis KFR, no occupied karst features are known to occur in the project vicinity and the closest known location for a federally listed karst species occurs approximately 2.12 miles northeast of the Mopac/US 290 interchange. Karst invertebrates and their potential occurrence within the project area are discussed in **Section 7** below.

A Geologic Assessment (GA) was conducted for the portion of the project area located over the Edwards Aquifer Recharge Zone in 2009, updated in 2016 (Rahe, 2009; HDR, 2016), and revised in 2019 (HDR, 2019). Six geologic features were documented and discussed in the Final EIS/ROD. All six previous features were located in the general vicinity of Williamson Creek at the US 290/SH 71 crossing. The six features described in 2016 were evaluated as sensitive (i.e., they have the potential to provide aquifer recharge pathways) and located over the Edwards Aquifer Recharge Zone.

The revised GA was completed in March 2019 and is provided under separate cover. The revised assessment included surveys of the proposed detention pond facilities and other properties that were granted right-of-entry following the 2018 Final EIS/ROD. Six additional features (F-7 to F-12) were identified during the field investigation (**Figure 5**). One of these features (F-12), located south of US 290 and east of RM 1826 over the Edwards Aquifer Contributing Zone, is a solution enlarged fracture in a streambed. This feature is located within the existing right-of-way and within the ordinary high water mark of the drainage. It was determined that this feature has a drainage area greater than six acres and was evaluated as sensitive with a moderate potential for infiltration. The revised GA reported that this feature included characteristics that could contribute greater than average recharge to the Edwards Aquifer. The remaining five features were evaluated as non-sensitive with low relative potential for infiltration. The Final EIS/ROD identified several Best Management Practices (BMPs) for protection of sensitive geologic features that would likely be applied to the feature F-12 found in 2019:

- Proposed protection measures for these sensitive features would include preventive BMPs including dikes, berms, mulching, erosion control blankets, and other protective measures.
- The following commitments would be required:
 1. Prepare a SW3P (including erosion control, sedimentation control, and post-construction TSS removal requirements).
 2. Prepare a WPAP according to 30 Texas Administrative Code Chapter 213 of the Edwards Aquifer Rules.
 3. If voids or water flow are encountered, 30 Texas Administrative Code 213.5(f)(2) requires that construction cease in the vicinity of the void. As described in the “Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones” (TCEQ-0585-Instructions [Rev. 10-01-04]), a void is “a natural cavity or depression formed as a result of dissolution of limestone... [which is] not large enough for a normal-sized person to enter but appears to be part of a system of interconnected voids that connect the surface with the subsurface.” Another type of void is a cave, which is described as “a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter” (TCEQ, 2004b). If, during construction, water is encountered in conjunction with a cavity or a cave, all potential pathways for contaminant movement to the Edwards Aquifer would be identified, and sufficient geologic information would be provided so that the appropriate BMPs can be designed and implemented. A geologist will evaluate the void and work with the design engineer, if necessary, to develop a void mitigation plan. The void mitigation plan must be certified by a geologist, submitted to the TCEQ, and approved prior to the implementation of mitigation and before continuing

construction in the vicinity of the void. A specific karst void discovery protocol would be developed for the project for all excavation phases.

3.2 Soils

Geologic formations and their associated soils provide the foundation for the vegetation assemblages that are indicative of the Edwards Plateau. Soils from two associations underlie the Oak Hill Parkway project area (NRCS, 2018) (Figure 6). The eastern portion of the project area consists of soils from the Speck-Tarrant association, which are characterized by shallow, stony, loamy soils and very shallow, stony, clayey soils overlying limestone. The western portion of the project area consists of soils from the Brackett association. Brackett soils are characterized by their shallow, gravelly, calcareous, loamy textures and overlie interbedded limestone and marl. Soils within the area of the proposed detention ponds are of the Brackett and Volente series. According to Natural Resource Conservation Service (NRCS) data (2018), 12 soil types are located in the project area and exhibit a range of slopes and infiltration characteristics. No soils within the project area are mapped as hydric or as containing hydric inclusions. Several soils are mapped as prime farmland soils. A list of soils occurring within the project area is included as Table 1.

Table 1: Soils within the Oak Hill Parkway Project Area

| Soil Series Code | Soil Series | Hydric (Yes/No) | Prime Farmland (Yes/No) |
|------------------|--|-----------------|-------------------------|
| BID | Brackett-Rock outcrop complex, 1 to 12 percent slopes | No | No |
| BoF | Brackett-Rock outcrop-Real complex, 8 to 30 percent slopes | No | No |
| CrA | Crawford clay, 0 to 1 percent slopes | No | Yes |
| CrB | Crawford clay, 1 to 3 percent slopes | No | Yes |
| DeB | Denton silty clay, 1 to 3 percent slopes | No | Yes |
| GP | Pits, gravel, 1 to 90 percent slopes | No | No |
| Md | Mixed alluvial land, 0 to 1 percent slopes, frequently flooded | No | No |
| PuC | Purves silty clay, 1 to 5 percent slopes | No | No |
| SaB | San Saba clay, 1 to 2 percent slopes | No | Yes |
| SsC | Speck stony clay loam, 1 to 5 percent slopes | No | No |
| TcA | Tarrant and Speck soils, 0 to 2 percent slopes | No | No |
| VoD | Volente silty clay loam, 1 to 8 percent slopes | No | No |

Source: NRCS, 2018

The project area soils remain the same as that described in the Final EIS.

4. WATER RESOURCES

The proposed project is located in the Austin-Travis Lakes 8-digit hydrological unit code watershed (12090205). The eastern half of the project is within the Edwards Aquifer Recharge Zone and the remaining project area is over the Edwards Aquifer Contributing Zone (Figure 4). The project area crosses the watersheds of Slaughter Creek, Williamson Creek, and Barton Creek. Within the project area, US 290 is crossed by Wheeler Branch, Williamson Creek, Devil’s Pen Creek, and five unnamed tributaries to Williamson Creek and Wheeler Branch (Figure 7a); SH 71 is crossed by Scenic Brook

Tributary and Williamson Creek (**Figure 7b**). The OHP Project alignment crosses the Federal Emergency Management Agency (FEMA) designated 100-year floodplains associated with Williamson Creek and Devil’s Pen Creek. Williamson Creek and Devil’s Pen Creek are the only intermittent waterways within the project area; the remaining creeks and tributaries are ephemeral.

A revised wetland and waters of the U.S. delineation was conducted in March 2019. This effort identified 14 streams, 2 open waters, and 2 wetland sites within the OHP Project area. Of these, four features (one stream, two open water features, and one wetland) were added as a result of 2019 field investigations and were not discussed in the Final EIS/ROD. To date, no coordination with the USACE regarding jurisdictional determinations or wetland delineations has occurred regarding the OHP project. All proposed roadway and drainage improvements would be designed in a manner to avoid or minimize impacts to jurisdictional features. It is anticipated that impacts to waters of the U.S. would be authorized through Nationwide Permit (NWP) #14. If any of the wetlands would be impacted, a Pre-Construction Notification (PCN) would be required. A detailed explanation of wetlands and waters within the project area can be found in the *Oak Hill Parkway Water Resources Technical Report Addendum* (TxDOT, 2019). No significant impacts to waters of the U.S., including wetlands, are anticipated as a result of the proposed design revisions.

5. VEGETATION

The following Ecological Mapping Systems of Texas (EMST) vegetation types were identified within the project area: (1) Edwards Plateau: Ashe Juniper Motte and Woodland, (2) Edwards Plateau: Deciduous Oak/Evergreen Motte Woodland, (3) Edwards Plateau: Savanna Grassland, (4) Edwards Plateau: Floodplain Juniper Shrubland, (5) Edwards Plateau: Riparian Hardwood Forest, (6) Native Invasive: Mesquite Shrubland, and (7) Urban Low Intensity (**Figure 8a-h**). These seven EMST types correspond to the “Disturbed Prairie”, “Edwards Plateau Savannah, Woodland, and Shrubland”, “Floodplain”, “Riparian”, and “Urban” habitat types which are identified in the 2013 TxDOT – Texas Parks and Wildlife (TPWD) Memorandum of Understanding (MOU) Programmatic Agreement 2017 Revision.

Based on site visits conducted in January, May, and June 2016 by qualified biologists, it was determined that much of vegetation within the existing right-of-way consists of maintained grasses and forbs. Although a mixture of native hardwoods, Ashe juniper (*Juniperus ashei*), and introduced tree species persist as an overstory component adjacent to the roadways in Oak Hill, the majority of vegetation within the current transportation right-of-way fits the description of “Urban Low Intensity” habitat. Several fragmented patches of unmaintained native vegetation are located within the proposed right-of-way along US 290 and SH 71, west of Williamson Creek (**Photos 7 – 9**). Typical vegetation within these areas consists of an Ashe juniper, sugarberry (*Celtis laevigata*), Chinaberry (*Melia azedarach*), American sycamore (*Platanus occidentalis*), black walnut (*Juglans nigra*), Texas mountain laurel (*Sophora secundiflora*), and plateau live oak (*Quercus fusiformis*) overstory with a mixed shrub and grass understory of evergreen sumac (*Rhus virens*), Texas persimmon (*Diospyros texana*), Texas pricklypear (*Opuntia engelmannii*), saw greenbriar (*Smilax bona-nox*), elbowbush (*Forestiera pubescens*), little bluestem (*Schizachyrium scoparium* var. *frequens*), mustang grape

(*Vitis mustangensis*), silver bluestem (*Bothriochloa laguroides*), purple horsemint (*Mondarda citriodora*), and scattered honey mesquite (*Prosopis glandulosa*).

Additional site visits were conducted in March 2019 following updated right-of-entry agreements with adjacent landowners. The areas of new right-of-way were generally consistent with the urban vegetation communities described above; however, the two upstream detention pond locations were also included in the 2019 effort and the results of those site visits are summarized below.

Vegetation within Pond 1 was best described as a mixture between Edwards Plateau: Savanna Grassland and Edwards Plateau: Ashe Juniper Motte and Woodland (**Figure 8h**). The properties were either actively grazed or used for recreational activities (disk golf course) and residential purposes (**Photos 18 -25**). An unnamed tributary to the headwaters of Williamson Creek traverses the central portion of Pond 1 (**Photos 26 - 27**). A relatively small patch of Edwards Plateau: Riparian Hardwood Forest occurs in the southwest corner of the detention pond location. The dominant overstory component included Ashe juniper, and plateau live oak, with scattered pecan (*Carya illinoensis*) and cedar elm (*Ulmus crassifolia*). The central portion of Pond 1 lacked a mid-story community due to grazing regimes. Along the margins, species such as yaupon (*Illex vomitoria*), Texas persimmon, evergreen sumac, agarita (*Mahonia trifoliolata*) and Spanish dagger (*Yucca aloifolia*) were present. The herbaceous cover was dominated by Bermudagrass (*Cynodon dactylon*), southern dewberry (*Rubus trivialis*), Queen Anne's lace (*Daucus carota*), perennial rye grass (*Lolium perenne*), saw greenbrier, wild onion (*Allium* sp.), clover (*Oxalis* sp.), and dandelion (*Taraxacum* sp.). Bushy bluestem (*Andropogon glomeratus*) was noted as occurring within the dry channel.

Vegetation within Pond 2 was best described as a mixture between Edwards Plateau: Savanna Grassland, Edwards Plateau: Deciduous Oak/Evergreen Motte Woodland, and Edwards Plateau: Riparian Hardwood Forest (**Figure 8h**). Pond 2 was primarily vegetated with only small patches of open grassland areas. A dry creek channel that may have been partially channelized traverses the central portion of the proposed detention pond. During the site visit, rock gabions, irrigation equipment, sewer infrastructure, and multiple debris piles were noted throughout the Pond 2 location (**Photos 30 - 34**). The overstory vegetation community at this site included plateau live oak, cedar elm, Ashe juniper, wax-leaf ligustrum (*Ligustrum japonicum*), American sycamore, Chinaberry, sugarberry, Osage-orange (*Maclura pomifera*), and eastern cottonwood (*Populus deltoides*). The midstory was dominated by wax-leaf ligustrum, Texas mountain laurel, Texas redbud (*Cercis canadensis* var. *tenensis*), Texas persimmons, evergreen sumac, Eastern baccharis (*Baccharis halimifolia*), and Ashe juniper. The herbaceous species included prickly pear cactus (*Opuntia engelmannii*), stickywilly (*Galium aparine*), curly dock (*Rumex crispus*), Queen Anne's lace, Canada goldenrod (*Solidago canadensis*), perennial ryegrass, and eastern poison ivy (*Toxicodendron radicans*).

5.1 Vegetation Impacts

As a result of the 2019 design revisions, vegetation impacts within the OHP Project area have increased by approximately 3.59 acres (**Table 2**). According to the TxDOT-TPWD *Threshold Table Programmatic Agreement* under the MOU, coordination thresholds for three MOU habitat types would

be exceeded by the proposed improvements; however, coordination with TPWD was completed as a result of the EIS process. The additional vegetation impacts would not occur in a new MOU habitat type nor would they result in the project exceeding a new vegetation threshold; therefore, the additional vegetation impacts would not require re-coordination with TPWD.

Table 2: Impacts to Observed Vegetation Types

| Observed Vegetation Type | Corresponding MOU Type | 2018 Final EIS/ROD Impacts (acres) | 2019 Reevaluation Impacts (acres) | PA Threshold (acres) | Threshold Exceeded? |
|--|---|------------------------------------|-----------------------------------|----------------------|---------------------|
| Urban | Urban | 120.45 | 123.39 | None | N/A |
| Edwards Plateau Ashe Juniper, Motte and Woodland | Edwards Plateau Savannah, Woodland, and Shrubland | 25.56 | 24.74 | 3.0 | Yes |
| Edwards Plateau Deciduous Oak/ Evergreen Mottle Woodland | | 53.21 | 54.32 | | |
| Edwards Plateau: Savanna Grassland | | 18.48 | 18.68 | | |
| <i>MOU Total</i> | | <i>97.25</i> | <i>97.74</i> | | |
| Edwards Plateau: Floodplain Ashe Juniper Shrubland | Riparian | 0.06 | 0.06 | 0.1 | Yes |
| Edwards Plateau: Riparian Hardwood Forest | | 19.43 | 19.48 | | |
| <i>MOU Total</i> | | <i>19.49</i> | <i>19.54</i> | | |
| Native Invasive: Mesquite Shrubland | Disturbed Prairie | 3.81 | 3.92 | 3.0 | Yes |
| Total | | 241.00 | 244.59 | | |

5.2 Unusual Vegetation and Special Habitat Features

In addition to the EMST vegetation and habitat components, any unusual vegetation features or special habitat features occurring within the project area were identified during field investigations and are described below.

As documented in the Final EIS/ROD, unusual vegetation features identified within the project area include unmaintained vegetation, riparian vegetation, and historically significant or locally important trees. Unmaintained vegetation occurs along the Williamson Creek drainage, particularly where the creek parallels the US 290/SH 71 roadway. The City of Austin has identified several trees within the project area as historically significant due to their size and age. Tree surveys were conducted within the project area where right-of-entry was granted by multiple survey teams (Atkins, 2007; Powell, 2015; SAM, 2015; SAM 2017; SAM 2019). Each survey mapped the location, species, and size of trees within the existing and proposed right-of-way. No tree health metrics or tree conditional assessments were conducted during these surveys. Final tree removal/disturbance numbers would be prepared once the design footprint and limit of constructions have been finalized. During the early

stages of this project, several “iconic” trees that held a higher community value due to their size, location, or local history were identified by the public. With that knowledge, the project team prioritized these “iconic” trees (“Beckett Grove Tree,” “Grandmother Oak,” “Grandfather Oak,” and “the Nieces”) for protection during project development. The 2019 design revisions included measures to shift the shared-use path in several locations to further avoid impacts to large trees within the project area.

Special habitat features within the project area include water bodies and existing bridges with observed bird colonies. Water bodies within the proposed project area include Wheeler Branch, Williamson Creek, Scenic Brook Tributary, Devil’s Pen Creek, several unnamed tributaries to Williamson Creek, two wetlands, and two open water features. Nesting swallows were observed within the concrete box culverts conveying Devil’s Pen Creek below US 290 at the western project terminus. No bats or evidence of bats (concrete staining or odor) were observed during visual surveys at any of the crossing structures during field investigation in January, May, or June 2016 or in 2019.

Although several new water bodies were identified in Pond 1, Pond 2, and along Williamson Creek and an additional 0.05 acres of riparian vegetation may be impacted as a result of the design revisions, no other species habitat features or unusual vegetation features were documented during the 2019 site investigations. Impacts to special habitat features and unusual vegetation features would be minimized through initial project design considerations and through the avoidance and minimization of vegetation removal. Construction activities would disturb only that which is necessary to construct the proposed project. The removal of native vegetation would be avoided to the greatest extent practicable and best management practices would be utilized to avoid impacts to migratory and nesting birds within the project area during construction activities. Landscaping enhancements such as tree plantings, tree relocation, and native seeding will be incorporated into the post-construction design as a voluntary measure to offset the impacts of tree removal in response to public comments.

6. FISH AND WILDLIFE RESOURCES

The Edwards Plateau ecoregion provides habitat for a wide range of reptilian, avian, and mammalian species that are common to the Central Texas environment. Common species have the potential to occur within the project area and on adjacent undeveloped land. Additional field investigations were completed in March 2019 to assess the habitat value of newly accessible parcels within the project area. This effort focused primarily on the undeveloped proposed detention pond locations.

It is anticipated that some wildlife species could be present within undeveloped portions of the existing and proposed right-of-way. Required clearing or other construction-related activities may directly or indirectly affect animals that reside on or adjacent to the project area right-of-way. Heavy machinery could kill small, low-mobility animals or could cause soil compaction, impacting animals that live underground. Larger, more-mobile species will typically avoid construction activities and move into adjacent areas. The proposed design revisions are not expected to substantially impact fish or wildlife within the project area. Although the proposed detention ponds include areas of

unmaintained vegetation and relic stands of oak-juniper woodlands, these locations are entirely surrounded by residential or commercial development. Human-induced disturbances, such as conversion to grazing or crop land, irrigation equipment, and litter piles were readily observed throughout these areas.

6.1 Migratory Bird Treaty Act

Under the Migratory Bird Treaty Act (MBTA), it is unlawful “by any means or manner, to pursue, hunt, take, capture, [or] kill” any migratory birds except as permitted by regulation (16 U.S.C. 703-704). During the 2016 field investigations, nesting swallows were noted under several bridges within the project area and several inactive bird nests were noted within roadside vegetation adjacent to US 290 and SH 71. In 2019, several unoccupied passerine nests were observed in patches of vegetation within the detention pond locations (**Photo 32**).

In the event that nesting migratory birds are encountered on-site during project construction, every effort would be made to avoid protected birds, active nests, eggs, and/or young. The contractor will be advised of the potential to find nesting migratory birds within the project area and will be instructed to avoid harming these species. The birds listed below in **Table 3** were observed during the field work and are comprised of both resident and migratory species.

Table 3: Observed Avian Species

| Common Name | Scientific Name | Status | Year Observed | MBTA Protected |
|------------------------------|---------------------------------|--------|---------------|----------------|
| Carolina Chickadee | <i>Poecille carolinensis</i> | -- | 2016, 2019 | Yes |
| Black-bellied Whistling Duck | <i>Dendrocygna autumnalis</i> | -- | 2019 | Yes |
| Black-crested Titmouse* | <i>Baeolophus atricristatus</i> | -- | 2016, 2019 | Yes |
| Blue Jay | <i>Cyanocitta cristata</i> | -- | 2016, 2019 | Yes |
| Brown-headed Cowbird | <i>Molothrus ater</i> | -- | 2016, 2019 | Yes |
| Cave Swallow | <i>Petrochelidon fulva</i> | -- | 2016 | Yes |
| Cedar Waxwing | <i>Bombycilla cedrorum</i> | -- | 2016, 2019 | Yes |
| Cliff Swallow | <i>Petrichelidon pyrrhonota</i> | -- | 2016 | Yes |
| Common Yellowthroat | <i>Geothlypis trichas</i> | -- | 2016 | Yes |
| Eastern Screech Owl | <i>Otus Asio</i> | -- | 2019 | Yes |
| Eurasian Collared-Dove | <i>Streptopelia decaocto</i> | -- | 2016 | No |
| European Starling | <i>Sturnus vulgaris</i> | -- | 2019 | No |
| Greater Roadrunner | <i>Geococcyx californianus</i> | -- | 2016 | Yes |
| Great-tailed Grackle | <i>Quiscalus mexicanus</i> | -- | 2016, 2019 | Yes |
| House Finch | <i>Haemorhous mexicanus</i> | -- | 2016, 2019 | Yes |
| House Sparrow | <i>Passer domesticus</i> | -- | 2016, 2019 | No |
| Killdeer | <i>Charadrius vociferus</i> | -- | 2016 | Yes |
| Ladderback Woodpecker | <i>Dryobates scalaris</i> | -- | 2019 | Yes |

| Common Name | Scientific Name | Status | Year Observed | MBTA Protected |
|----------------------|----------------------------------|--------|---------------|----------------|
| Mourning Dove | <i>Zenaida macroura</i> | -- | 2016, 2019 | Yes |
| Northern Cardinal | <i>Cardinalis cardinalis</i> | -- | 2016, 2019 | Yes |
| Northern Mockingbird | <i>Mimus polyglottos</i> | -- | 2016, 2019 | Yes |
| Red-tailed Hawk | <i>Buteo jamaicensis</i> | -- | 2016, 2019 | Yes |
| Savannah Sparrow | <i>Passerculus sandwichensis</i> | -- | 2016, 2019 | Yes |
| Turkey Vulture | <i>Cathartes aura</i> | -- | 2016, 2019 | Yes |
| White-winged Dove | <i>Zenaida asiatica</i> | -- | 2016, 2019 | Yes |

Status Codes: -- = Species Not Considered Rare

*Note that most titmice in the Austin area are considered hybrids between Black-crested and Tufted Titmouse (*Baeolophus bicolor*)

Source: Study Team

6.2 Bald and Golden Eagle Protection Act

Within the U.S. or anywhere within its jurisdiction, Bald Eagles (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*) are protected by the Bald and Golden Eagle Protection Act (BGEPA) of 1940. No suitable nesting or foraging habitat exists within the project area for either of these species. Therefore, no impacts to eagles are anticipated from the 2019 design revisions or as a result of construction of the proposed project.

6.3 Executive Order 13112 on Invasive Species

No change in compliance with Executive Order (EO) 13112 is anticipated as a result of the proposed design revisions. In accordance with this EO on invasive species, native plant species would be used in landscaping and in the seed mixes where practicable following construction activities. Soil disturbance would be minimized in the right-of-way in order to minimize invasive species establishment.

6.4 Executive Memorandum on Beneficial Landscaping

No change in compliance with this Executive Memorandum is anticipated as a result of the proposed design revisions or reevaluation. Landscaping included with this project would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices.

6.5 Farmland Protection Policy Act (FPPA)

Although several of the soils within the OHP Project area are mapped as prime farmland soils (Table 1), the project is located within an urbanized area as mapped by the U.S. Census Bureau in 2010; therefore, it is not subject to the conditions of the FPPA. No change in compliance with the FPPA is anticipated as a result of the proposed design revisions.

6.6 Fish and Wildlife Coordination Act

Preliminary design indicates that the proposed project would be authorized under a NWP #14 from the U.S. Army Corps of Engineers (USACE) and, therefore, coordination under the Fish and Wildlife Coordination Act (FWCA) would not be required for the proposed project. No change in compliance with FWCA is anticipated as a result of the proposed design revisions.

6.7 Coastal Regulations

Travis County is not a coastal county (**Figure 1**). The OHP Project is not located on the Gulf Coast or within a tidal area and no tidally influenced waters are located within the project area. Therefore, the Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat), the Marine Mammal Protection Act, and the Coastal Barrier Resources Act are not applicable to this project. No change in compliance with any of these regulations are anticipated as a result of the proposed design revisions.

6.8 Endangered Species Act

The USFWS regulates the take of federally-listed threatened and endangered species. The Final EIS and ROD documented that potential habitat federally threatened and endangered species could occur in or near the project area. TxDOT concluded that the project had the potential to affect, but not adversely affect the Barton Springs salamander (BSS; *Eurycea sosorum*) and Austin blind salamander (ABS; *Eurycea waterlooensis*). TxDOT completed consultation in December 2017 with the USFWS and received concurrence on the above effect determinations. **Section 7.1** below includes a summary of the consultation history for this project. No federally listed species were observed within the project area during field investigations in 2016 or 2019. No additional coordination with the USFWS regarding the 2017 concurrence is anticipated as a result of the reevaluation.

A discussion of potential effects to rare, threatened, or endangered wildlife species and their habitats is included in **Section 7**.

7. HABITAT FOR THREATENED OR ENDANGERED SPECIES

Lists of threatened and endangered species maintained by the USFWS Information for Planning and Conservation (IPaC) system and TPWD were consulted to determine which species could occur in the project area (**Attachment C**). These species are listed in **Table 4**, along with their listing status, a description of appropriate habitat, a determination of whether habitat for those species occurs within the project area, and level of potential impact/effect to the species.

A habitat assessment for each species was completed utilizing a combination of desktop analysis, such as vegetation mapping, soils and geology information, and field verification by qualified biologists (USFWS Species Recovery Permit # TE168185-3 and TPWD Scientific Research Permit # SPR-0691-409). Field visits in January, May, and June of 2016 were conducted within the existing right-of-way to assess suitability of habitat. In March 2019, following the receipt of new right-of-entry

agreements from adjacent landowners, several additional parcels, including the two proposed detention pond locations, were assessed for suitability of habitat for protected species.

Table 4: Threatened, Endangered, and Species of Greatest Conservation Need of Potential Occurrence in Travis County, Texas

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|---|----------------------------------|------------------------|---|
| Plants | | | | | | |
| Arrowleaf milkvine <i>Matelea sagittifolia</i> | NL | SGCN | Most consistently encountered in thornscrub in South Texas; Perennial; Flowering March-July; Fruiting April-July & Dec | No | No Impact | No thornscrub habitat occurs within the project area. TXNDD recorded EOs within Barton Creek greenbelt in 1984. The proposed project would not have any impact on the Barton Creek greenbelt or similar habitat types. |
| Basin bellflower <i>Campanula reverchonii</i> | NL | SGCN | Texas endemic; among scattered vegetation on loose gravel, gravelly sand, and rock outcrops on open slopes with exposures of igneous and metamorphic rocks; may also occur on sandbars and other alluvial deposits along major rivers; flowering May-July | No | No Impact | Typically associated with the Llano uplift; No granite, loose gravel, or alluvial deposits located within the project area. |
| Boerne bean <i>Phaseolus texensis</i> | NL | SGCN | Narrowly endemic to rocky canyons in eastern and southern Edwards Plateau occurring on limestone soils in mixed woodlands, on limestone cliffs and outcrops, frequently along creeks | Yes | May Impact | Limestone soils in mixed woodlands and rocky outcrops are present within the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, some portions of the project area were not surveyed due to right-of-entry restrictions. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|---|----------------------------------|------------------------|---|
| Bracted twistflower <i>Streptanthus bracteatus</i> | C | SGCN | Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations; populations fluctuate widely from year to year, depending on winter rainfall; flowering mid-April-late May, fruit matures and foliage withers by early summer | Yes | May Affect | Project is located on Glen Rose formation. Shallow, gravelly soils and oak-juniper woodlands present. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. The species is a candidate for federal listing. If the species becomes listed prior to construction, TxDOT would make a determination as to whether additional coordination would occur depending on the results of presence/absence surveys. In 2018, an occurrence of this species was added to the TxNDD within 1.5 miles of the project area. The TxNDD occurrence is located within the Barton Creek Greenbelt, which would not be impacted as a result of the proposed improvements. |
| Buckley tridens <i>Tridens buckleyanus</i> | NL | SGCN | Occurs in juniper-oak woodlands on rocky limestone slopes; Perennial; Flowering/Fruiting April-Nov | Yes | May Impact | Juniper-oak woodlands and limestone slopes occur in the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Correll's false dragon-head <i>Physostegia correlli</i> | NL | SGCN | Wet, silty clay loams on streamsides, in creek beds, irrigation channels and roadside drainage ditches; or seepy, mucky, sometimes gravelly soils along riverbanks or small islands in the Rio Grande; or underlain by Austin Chalk limestone along gently flowing spring-fed creek in Central Texas; flowering May-September | No | No Impact | Soils along creeks and streambeds are typically dry; streams are intermittent and are rarely flowing long enough to support seepy or wet soils. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|---|----------------------------------|------------------------|--|
| Glass Mountains coral-root <i>Hexalectris nitida</i> | NL | SGCN | Apparently rare in mixed woodlands in canyons in the mountains of Brewster County, but encountered with regularity, albeit in small numbers, under <i>Juniperus ashei</i> in woodlands over limestone on the Edwards Plateau, Callahan Divide and Lampasas Cutplain; Perennial; Flowering June-Sept; Fruiting July-Sept | Yes | May Impact | Ashe juniper woodlands occur in the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Gravelbar brickellbush <i>Brickellia dentata</i> | NL | SGCN | Essentially restricted to frequently-scoured gravelly alluvial beds in creek and river bottoms; Perennial; Flowering June-Nov; Fruiting June-Oct | Yes | May Impact | Potentially suitable habitat exists within the channel of Williamson Creek and its tributaries. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Heller's marbleseed (Heller's false gromwell) <i>Onosmodium helleri</i> | NL | SGCN | Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone slopes, often in more mesic portions of canyons; Perennial; Flowering March-May | Yes | May Impact | Calcareous soils in oak-juniper woods occur within the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. TXNDD recorded EOs within the Barton Creek greenbelt (most recent in 1984). The proposed project would not have any impact on the Barton Creek greenbelt or similar habitat types. |
| Low spurge <i>Euphorbia peploidion</i> | NL | SGCN | Occurs in a variety of vernal-moist situations in a number of natural regions; Annual; Flowering Feb-April; Fruiting March-April | Yes | May Impact | Vernal-moist locations occur throughout the project area at several of the creek crossing locations. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|---|----------------------------------|------------------------|--|
| Narrowleaf brickelbush <i>Brickellia eupatorioides</i> var. <i>gracillima</i> | NL | SGCN | Moist to dry gravelly alluvial soils along riverbanks but also on limestone slopes; Perennial; Flowering/Fruiting April-Nov | Yes | May Impact | Gravelly alluvial soils and limestone slopes occur in the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Net-leaf bundleflower <i>Desmanthus reticulatus</i> | NL | SGCN | Mostly on clay prairies of the coastal plain of Central and south Texas; Perennial; Flowering April-July; Fruiting April-Oct | No | No Impact | No clay prairies occur within the project area. |
| Plateau loosestrife <i>Lythrum ovalifolium</i> | NL | SGCN | Banks and gravelly beds of perennial (or strong intermittent) streams on the Edwards Plateau, Llano Uplift and Lampasas Cutplain; Perennial; Flowering/Fruiting April-Nov | No | No Impact | No perennial streams occur within the project area. Williamson Creek is intermittent. |
| Plateau milkvine <i>Matelea edwardsensis</i> | NL | SGCN | Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; Flowering March-Oct; Fruiting May-June | Yes | May Impact | Juniper-oak and oak-juniper woodlands occur within the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Rock grape <i>Vitis rupestris</i> | NL | SGCN | Occurs on rocky limestone slopes and in streambeds; Perennial; Flowering March-May; Fruiting May-July | Yes | May impact | Williamson Creek and rocky slopes occur in the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Scarlet leather-flower <i>Clematis texensis</i> | NL | SGCN | Usually in oak-juniper woodlands in mesic rocky limestone canyons or along perennial streams; Perennial; Flowering March-July; Fruiting May-July | No | No Impact | No mesic canyons occur within the project area. This species requires moist soil along streambanks; the project area includes creeks that are intermittent and prone to periods of drought. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|------------------------|--|
| Stanfield's beebalm <i>Monarda punctata</i> var. <i>stanfieldii</i> | NL | SGCN | Largely confined to granite sands along the middle course of the Colorado River and its tributaries; Perennial | No | No Impact | No granite sands occur within the project area. |
| Sycamore-leaf snowbell <i>Styrax platanifolius</i> ssp. <i>platanifolius</i> | NL | SGCN | Rare throughout range, usually in oak-juniper woodlands on steep rocky banks and ledges along intermittent or perennial streams, rarely far from some reliable source of moisture; Perennial; Flowering April-May; Fruiting May-Aug | No | No Impact | No steep rock banks along Williamson Creek or the other drainages occur within the project area. |
| Texabama croton <i>Croton alabamensis</i> var. <i>texensis</i> | NL | SGCN | Texas endemic; in duff-covered loamy clay soils on rocky slopes in forested, mesic limestone canyons; locally abundant on deeper soils on small terraces in canyon bottoms, often forming large colonies and dominating the shrub layer; scattered individuals are occasionally on sunny margins of such forests; also found in contrasting habitat of deep, friable soils of limestone uplands, mostly in the shade of evergreen woodland mottes; flowering late February-March; fruit maturing and dehiscing by early June | Yes | May Impact | Potentially suitable habitat exists along the project area where overstory oaks and juniper shade limestone soils. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Texas almond <i>Prunus minutiflora</i> | NL | SGCN | Wide-ranging but scarce, in a variety of grassland and shrubland situations, mostly on calcareous soils underlain by limestone but occasionally in sandier neutral soils underlain by granite; Perennial; Flowering Feb-May & Oct; Fruiting Feb-Sept | Yes | May Impact | Shrubland and grassland habitats occur in the proposed detention pond locations and in unmaintained vegetation along the existing corridor. No individuals were identified during field vegetation surveys in 2016 or during surveys of the detention pond locations in 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|---|----------------------------------|------------------------|--|
| Texas amorpha <i>Amorpha roemeriana</i> | NL | SGCN | Juniper-oak woodlands or shrublands on rocky limestone slopes, sometimes on dry shelves above creeks; Perennial; Flowering May-June; Fruiting June-Oct | Yes | May Impact | Species may occur in juniper-oak woodlands or shrublands on rock limestone slopes or on dry shelves above Williamson Creek. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Texas barberry <i>Berberis swaseyi</i> | NL | SGCN | Shallow calcareous stony clay of upland grasslands/shrublands over limestone as well as in loamier soils in openly wooded canyons and on creek terraces; Perennial; Flowering/Fruiting March-June | Yes | May Impact | Appropriate soils under grassland/shrublands occur within the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Texas fescue <i>Festuca versuta</i> | NL | SGCN | Occurs in mesic woodlands on limestone-derived soils on stream terraces and canyon slopes; Perennial; Flowering/Fruiting April-June | Yes | May Impact | Suitable habitat occurs within the undeveloped woodland areas of the project location. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. Several EO IDs occur within 1.5 miles of the project area. |
| Texas milk vetch <i>Astragalus reflexus</i> | NL | SGCN | Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June | Yes | May Impact | Roadsides on calcareous and clay substrates occur in the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|------------------------|--|
| Texas seyeria <i>Seymeria texana</i> | NL | SGCN | Found primarily in grassy openings in juniper-oak woodlands on dry rocky slopes but sometimes on rock outcrops in shaded canyons; Annual; Flowering May-Nov; Fruiting July-Nov | Yes | May Impact | This species may occur in unmaintained vegetation under Ashe juniper woodlands in the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Tree dodder <i>Cuscuta exaltata</i> | NL | SGCN | Parasitic on various <i>Quercus</i> , <i>Juglans</i> , <i>Rhus</i> , <i>Vitis</i> , <i>Ulmus</i> , and <i>Diospyros</i> species as well as <i>Acacia berlandieri</i> and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct | Yes | May Impact | Host tree species occur throughout the project area. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Warnock’s coral root <i>Hexalectris warnockii</i> | NL | SGCN | In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; on the Edwards Plateau in oak-juniper woodlands on limestone slopes; flowering June-September; individual plants do not usually bloom in successive years | Yes | May Impact | Oak-juniper woodlands on limestone slopes are present; intermittent, rocky creek beds exist along Williamson Creek. No individuals were identified during field vegetation surveys in 2016 or 2019; however, not all project areas were surveyed due to right-of-entry restrictions. |
| Mollusks | | | | | | |
| False spike mussel <i>Fusconia (=Quadrula) mitchelli</i> | NL | T | This species is native to the Brazos, Colorado, and Guadalupe basins of Central Texas. This species had been presumed extinct, but surveys conducted in recent years have confirmed the presence of live false spike at several locations throughout its historic range, including the lower Guadalupe River near Gonzales, TX | No | No Impact | Historic range included rivers within the Colorado River basins however, Williamson Creek is susceptible to periods of drought, which allow only for small areas of perennial pool refugia around the project area. This species is not known to persist in impoundments or non-flowing streams. |
| Golden Orb <i>Quadrula aurea</i> | C† | T | Sand and gravel in some locations and mud at others; found in lentic and lotic; Guadalupe, San Antonio, Lower San Marcos, and Nueces River basins | No | No Effect | The project area is not located within the Guadalupe, San Antonio, San Marcos, or Nueces River basins. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|------------------------|---|
| Smooth pimpleback <i>Cyclonaias houstonensis</i> | C | T | Small to moderate streams and rivers and moderate size reservoirs; mixed mud, sand, and fine gravel, tolerates very slow to moderate flow rates, appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms | No | No Effect | Known from the Colorado River basin. However, Williamson Creek is susceptible to periods of drought and experiences dramatic water level fluctuations during rain events, which creates unsuitable substrate habitat and conditions for this species. |
| Texas fatmucket <i>Lampsilis bracteata</i> | C | T | Streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and coarse gravel or sand in moderately flowing water | No | No Effect | Known from the Colorado River basin; however, Williamson Creek is susceptible to periods of drought, which allow only for small areas of perennial pool refugia around the project area. This species is not known to persist in impoundments or non-flowing streams. |
| Texas fawnsfoot <i>Truncilla macrodon</i> | C† | T | Little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins | No | No Effect | Known from the Colorado River basin. However, Williamson Creek is susceptible to periods of drought and does not sustain moderate flows within the project area. |
| Texas pimpleback <i>Quadrula petrina</i> | C | T | Mud, gravel and sand substrates, generally in areas with slow flow rates | No | No Effect | Known from the Colorado River basin. However, Williamson Creek is susceptible to periods of drought and experiences dramatic water level fluctuations during rain events, which creates unsuitable substrate habitat for this species. |
| Crustaceans | | | | | | |
| An amphipod <i>Stygobromus russelli</i> | NL | SGCN | Subterranean waters, usually in caves and limestone aquifers; resident of numerous caves; 10 counties of the Edwards Plateau | No | No Impact | No caves are known to be in the project area. Stormwater pollution control BMPs would be in place to protect water quality in receiving streams. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|---|----------------------------------|------------------------|--|
| Balcones Cave amphipod <i>Stygobromus balconi</i> | NL | SGCN | Subaquatic, subterranean obligate amphipod | No | No Impact | No caves are known to be in the project area. Stormwater pollution control BMPs would be in place to protect water quality in receiving streams. |
| Bifurcated cave amphipod <i>Stygobromus bifurcates</i> | NL | SGCN | Found in cave pools | No | No Impact | No caves are known from the project area. No impacts to cave pools anticipated. Stormwater pollution control BMPs would be in place to protect water quality in receiving streams. |
| Insects | | | | | | |
| Kretschmarr Cave mold beetle <i>Texamaurops reddelli</i> | LE | SGCN | Small, cave-adapted beetle found under rocks buried in silt; small, Edwards Limestone caves of the Jollyville Plateau | No | No Effect | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Tooth Cave blind rove beetle <i>Cylindropsis</i> sp 1 | NL | SGCN | One specimen collected from Tooth Cave; only known North American collection of this genus | No | No Impact | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Tooth Cave ground beetle <i>Rhadine persephone</i> | LE | SGCN | Resident, small, cave-adapted beetle found in small Edwards Limestone caves in Travis and Williamson Counties | No | No Effect | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Arachnids | | | | | | |
| Bandit Cave spider <i>Cirurina bandida</i> | NL | SGCN | Very small, subterranean obligate | No | No Impact | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|--|----------------------------------|------------------------|--|
| Bee Creek Cave harvestman <i>Texella reddelli</i> | LE | SGCN | Small, blind, cave-adapted; endemic to a few caves in Travis and Williamson Counties | Yes | No Effect | Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. However, project occurs within the South Travis County Karst Fauna Region (KFR). No occupied karst features are known to occur in the project vicinity. Closest known location for this species occurs approximately 2.12 miles northeast of the Mopac/US 290 interchange. No karst features that were identified during the GA in 2016 or 2019 contained suitable habitat for this species. If caves are encountered during construction, ground-disturbing activities should halt until a habitat survey is completed. |
| Bone Cave harvestman <i>Texella reyesi</i> | LE | SGCN | Small, blind, cave-adapted; endemic to a few caves in Travis and Williamson Counties | No | No Effect | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Reddell harvestman <i>Texella reddelli</i> | LE* | SGCN | Small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson counties | No | No Effect | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Tooth Cave pseudoscorpion <i>Tartarocreagris texana</i> | LE | SGCN | Small, cave-adapted; small limestone caves of the Edwards Plateau | No | No Effect | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Tooth Cave spider <i>Tayshaneta</i> (= <i>Neoleptoneta</i>) <i>myopica</i> | LE | SGCN | Very small, cave-adapted, sedentary | No | No Effect | Project occurs outside known range of this species. Project occurs within Karst Zone 3, areas which probably do not contain listed karst species. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|---|----------------------------------|------------------------|---|
| Warton’s cave meshweaver <i>Cicurina wartoni</i> | NL | SGCN | Very small, cave-adapted spider | No | No Impact | This species is only known from one cave, Pickle Pit, in northwestern Travis County. Project occurs outside known range of this species and occurs within Karst Zone 3, areas which probably do not contain listed karst species. |
| Fishes | | | | | | |
| Blue Sucker <i>Cycleptus elongatus</i> | NL | T | Usually inhabits channels and flowing pools with a moderate current, with bottoms of exposed bedrock sometimes in combination with hard clay, sand, and gravel; generally intolerant of highly turbid conditions. Larger portions of major rivers in Texas; adults winter in deep pools and move upstream in spring to spawn on riffles | No | No impact | Current range includes the lower Colorado River basin; however, streams within the project area do not support flowing pools with moderate current or deep pools. |
| Guadalupe Bass <i>Micropterus treculii</i> | NL | SGCN | Endemic to perennial streams of the Edwards’s Plateaus region; introduced to the Nueces River system | Yes | May Impact | Potential habitat exists within perennial pools of Williamson Creek. This species may occur within the project area during periods of consistent stream flow, however, resident populations within the project area are highly unlikely. Stormwater pollution control BMPs would be in place to protect water quality in receiving streams. |
| Smalleye Shiner <i>Notropis buccula</i> | LE* | SGCN | Endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates | No | No Effect | According to the life history requirements of this species and the intermittency of Williamson Creek, occupancy within this portion of the Colorado River basin (Williamson Creek) is unlikely due to the presence of impoundments along the river. No recent occurrences of this species have been recorded. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|--|---|
| Sharpnose Shiner <i>Notropis oxyrhynchus</i> | LE* | SGCN | Endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud | No | No Effect | According to the life history requirements of this species and the intermittency of Williamson Creek, occupancy within this portion of the Colorado River basin (Williamson Creek) is unlikely due to the presence of impoundments along the river. No recent occurrences of this species have been recorded. |
| Western Creek Chubsucker <i>Erimyzon claviformis</i> | NL | T | Habitat includes silt-, sand-, and gravel-bottomed pools of clear headwaters, creeks, and small rivers; often near vegetation; occasionally in lakes (Page and Burr 2011). Spawning occurs in river mouths or pools, riffles, lake outlets, or upstream creeks (Becker 1983, Goodyear et al. 1982). Prefers headwaters, but seldom occurs in springs | No | No impact | Although the headwaters of Williamson Creek occur within the project area, suitable habitat (silt-, sand-, and gravel-bottomed pools) or spawning areas do not occur within the project area. |
| Amphibians | | | | | | |
| Austin blind salamander <i>Eurycea waterlooensis</i> | LE | E | Mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton Springs | Yes | May Affect, Not Likely to Adversely Affect | The project area is located within the Barton Springs segment of the Edwards Aquifer. Although no direct effects to salamanders or their subsurface/spring habitat are anticipated, indirect effects to this species due to water quality are considered due to the location of the project over the Edwards Aquifer Recharge Zone. This species has designated Critical Habitat at Barton Springs. Therefore, this project May Affect but is Not Likely to Adversely Affect this species. The USFWS issued concurrence with this effect determination in 2017. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|---|----------------------------------|--|--|
| Barton Springs salamander <i>Eurycea sosorum</i> | LE | E | Dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; spring dweller, but ranges into subterranean water-filled caverns | Yes | May Affect, Not Likely to Adversely Affect | The project area is located with the Barton Springs segment of the Edwards Aquifer. Although no direct effects to salamanders or their subsurface/spring habitat are anticipated, indirect effects to this species due to water quality are considered due to the location of the project over the Edwards Aquifer Recharge and Contributing Zones. This project May Affect but is Not Likely to Adversely Affect this species. The USFWS issued concurrence with this effect determination in 2017. |
| Jollyville Plateau salamander <i>Eurycea tonkawae</i> | LT | SGCN | Known from springs and waters of some caves north of the Colorado River | No | No Effect | No springs are known to occur in the project vicinity. Project area is outside of accepted species range. This species has designated Critical Habitat north of the Colorado River; no effect to any Critical Habitat would occur as a result of the proposed project. |
| Pedernales River springs salamander <i>Eurycea</i> sp 6 | NL | SGCN | Endemic; known only from springs | No | No Impact | The project area does not include the Pedernales River or any adjacent springs. Project area is outside of accepted species range. |
| Reptiles | | | | | | |
| Spot-tailed earless lizard <i>Holbrookia lacerata</i> | NL | SGCN | Central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground | No | No Impact | No prairie-bushland or flat, vegetation-free areas are known to occur in the project area. TXNDD occurrence record is from 1953; there are no recent observations in Travis County for this species. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|--|----------------------------------|------------------------|---|
| Texas garter snake <i>Thamnophis sirtalis annectens</i> | NL | SGCN | Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August | Yes | May Impact | Potentially suitable habitat exists along riparian areas within the project area. No individuals of this species were identified during field investigations conducted in 2016 or 2019. |
| Texas horned lizard <i>Phrynosoma cornutum</i> | NL | T | Open, arid and semi-arid regions with sparse vegetation, soil varies in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September | No | No Impact | No open, arid or semi-arid areas with sparse vegetation occur within the project area. No harvester ants (the primary food source for the species) were observed during field investigations in 2016 or 2019. |
| Texas tortoise <i>Gopherus berlandieri</i> | NL | T | Open brush with a grass understory is preferred; open grass and bare ground are avoided. Seasonally flooded tidal flats are not utilized. When inactive occupies shallow depressions at base of bush or cactus, sometimes in underground burrows or under objects; longevity greater than 50 years; active March-November; breeds April-November | Yes | May impact | Open brush areas with a grass understory are present within several undeveloped tracts of land adjacent to US 290 and within Pond 2. No evidence of this species was identified during site investigations in 2016 or 2019. |
| Timber rattlesnake <i>Crotalus horridus</i> | NL | T | Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto | No | No impact | No dense groundcover in swamps, floodplains, upland pine and deciduous woodland, or abandoned farmland occurs within the project area. Riparian areas and limestone bluffs are present but are located adjacent to or within areas that are maintained as transportation right-of-way or are isolated from contiguous tracts of suitable habitat. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|------------------------|---|
| Birds | | | | | | |
| American Peregrine Falcon <i>Falco peregrinus anatum</i> | DL | T | Resident of west Texas, migrant across the rest of the state; winters along coast; occupies wide range of habitats during migration, including urban; stopovers at leading landscape edges | No | No Impact | No breeding or wintering habitat is present within the project area. The species is a potential migrant; any use of the project area would be incidental. |
| Arctic Peregrine Falcon <i>Falco peregrinus tundrius</i> | DL | SGCN | Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands | No | No Impact | No breeding or wintering habitat is present within the project area. The species is a potential migrant; any use of the project area would be incidental. |
| Bald Eagle <i>Haliaeetus leucocephalus</i> | DL | T | Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water | No | No Impact | No breeding or wintering habitat is present within the project area. The species is a potential migrant; any use of the project area would be incidental and unlikely due to lack of suitable perch trees or foraging habitat. |
| Black-capped Vireo (BCV) <i>Vireo atricapilla</i> | DL | E | Oak-juniper woodlands with a distinctive, patchy, two-layered aspect; shrub and tree layer with open, grassy spaces and foliage reaching to ground level for nesting cover | No | No Impact | The vegetation community in the project area lacks the understory and midstory structure required for this species' habitat. Due to the urbanized nature of the project area and the low-quality habitat, the probability of BCV utilizing the right-of-way or adjacent area is very low. No BCV habitat is mapped by the BCCP as occurring within or adjacent the project area (BCCP, 2007). |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|------------------------|---|
| Black Rail <i>Laterallus jamaicensis</i> | PT | SGCN | Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of <i>Salicornia</i> | No | No Effect | No breeding or wintering habitat is present within the project area. The species is a potential migrant. |
| Golden-cheeked Warbler <i>Setophaga (=Dendroica) chrysoparia</i> | LE | E | Juniper-oak woodlands; long, fine bark strips from mature Ashe juniper trees used in nest construction; nests in trees other than Ashe juniper; nests late March-early summer | No | No Effect | Although mature oak/Ashe juniper woodland communities exist adjacent to the project corridor, these patches of vegetation are fragmented, resulting in areas that are considered too small for utilization by this species (Campbell, 1995). The project area is highly urbanized and lacks tracks of continuous tree canopy cover. The majority of the project area is mapped as Zone 3 “Not Known to be Habitat” by the BCCP (BCCP, 2007). No occupied habitat is mapped within or adjacent to the project area. No BCCP preserve lands would be impacted by the proposed project improvements. |
| Interior Least Tern <i>Sterna antillarum athalassos</i> | LE | E | Nests along sand and gravel bars within braided streams, rivers; also known to nest on man-made structures such as wastewater treatment plants or gravel mines | No | No Effect | No sand or gravel bars or other appropriate nesting habitats occur within the project area. USFWS IPaC only requires this species to be considered for wind energy projects. |
| Mountain Plover <i>Charadrius montanus</i> | NL | SGCN | Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous | No | No Impact | No high plains or shortgrass prairie or plowed fields are present within the project area. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|-----------------|--------------|---|----------------------------------|------------------------|---|
| Peregrine Falcon <i>Falco peregrinus</i> | DL | T | Both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (<i>F. p. anatum</i>) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, <i>F.p. tundrius</i> is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat | No | No Impact | No breeding or wintering habitat is present within the project area. The species is a potential migrant; any use of the project area would be incidental. |
| Piping Plover <i>Charadrius melodus</i> | LT ⁺ | T | Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats. | No | No Effect | No breeding or wintering habitat is present within the project area. The species is a potential migrant; use of the project area would be incidental and unlikely. USFWS IPaC only requires this species to be considered for wind energy projects. |
| Red Knot <i>Calidris canutus rufa</i> | LT | SGCN | Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include clams in salt water or brackish bays. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy Counties | No | No Effect | No breeding or wintering habitat is present within the project area. The species is a potential migrant; any use of the project area would be unlikely and incidental. USFWS IPaC only requires this species to be considered for wind energy projects. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|---|----------------|--------------|--|----------------------------------|------------------------|---|
| Sprague's Pipit <i>Anthus spragueii</i> | NL | SGCN | Only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges | No | No Impact | No native upland prairie or coastal grasslands within the project area. The species is a potential migrant; any use of the project area would be incidental. |
| Swallow-tailed Kite <i>Elanoides forficatus</i> | NL | T | Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees | No | No impact | No swampy areas, marshes along rivers, lakes or ponds occur within the project area. No open woodlands or forest woodland edges occur along SH 71 or US 290. The species is a potential migrant; any use of the project area would be incidental. |
| Western Burrowing Owl <i>Athene cunicularia hypugaea</i> | NL | SGCN | Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows | No | No Impact | The species is a potential migrant; any use of the project area would be incidental. |
| White-faced Ibis <i>Plegadis chihi</i> | NL | T | Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats | No | No impact | No freshwater marshes, sloughs, irrigated rice fields, brackish or saltwater habitats occur in the project area. The species is a potential migrant; any use of the project area would be incidental. |
| Whooping Crane <i>Grus americana</i> | LE | E | Potential migrant via plains throughout state to coast; winters in coastal marshes | No | No Effect | No breeding or wintering habitat is present within the project area. No preferred stop-over habitat is present within the project area. The species is a potential migrant; any use of the project area would be incidental. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|---|----------------------------------|------------------------|---|
| Wood Stork <i>Mycteria Americana</i> | NL | T | Prefers to nest in large tracts of bald cypress (<i>Taxodium distichum</i>) or red mangrove (<i>Rhizophora mangle</i>); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960 | Yes | No impact | No bald cypress, mangroves, flooded pastures, or salt water occurs within the project area. Although shallow standing water occurs with Pond 1 and along Williamson Creek, this species is only a potential migrant through Central Texas and would not be reasonably expected to occur within the project area. Any use of the project area would be incidental. |
| Zone-tailed Hawk <i>Buteo albonotatus</i> | NL | T | Arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions | No | No impact | No arid open county, mesa or mountain country, wooded canyons, tree-lined rivers, lower deserts, conifers, or giant cottonwoods along riparian areas occur within the project area. The species is a potential migrant; any use of the project area would be incidental. |
| Mammals | | | | | | |
| Cave myotis bat <i>Myotis velifer</i> | NL | SGCN | Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (<i>Hirundo pyrrhonota</i>) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore | Yes | May Impact | No suitable roosting habitat was identified under the Williamson Creek bridge structures; however existing roadway culverts, abandoned buildings, swallow nests, and rock crevices within the project area may provide suitable habitat. No bats or evidence of bat occupation were identified during site visits in 2016 or 2019. |

| Species | Federal Status | State Status | Habitat Description | Habitat Present in Project Area? | Species Effect/ Impact | Pertinent Project Information |
|--|----------------|--------------|--|----------------------------------|------------------------|---|
| Plains spotted skunk <i>Spilogale putorius interrupta</i> | NL | SGCN | Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie | Yes | May Impact | Potentially suitable habitat exists along fencerows, woodland edges, and brushy areas. No individuals of this species were observed during site visits conducted in 2016 or 2019. |
| Red wolf <i>Canis rufus</i> | LE* | E | Extirpated; formerly known throughout eastern half of Texas | No | No Effect | This species is considered extirpated from Texas and would not be reasonably expected to occur within the project area. |

Sources: TPWD, 2018, “Annotated County Lists of Rare Species: Travis County” (last revision 8/9/2018), (included as **Attachment C**); TPWD, 2019, “Annotated County Lists of Rare Species: Travis County” (last revision 4/18/2019), (included as **Attachment C**); USFWS, 2019, “Official Species List for Project Area”, included as **Attachment C**.

Status Codes: LE = Federally Listed Endangered SGCN = Species of Greatest Conservation Need
 LT = Federally Listed Threatened NL = Not listed
 E = State-Listed Endangered PDL or DL = Proposed for Delisting or Delisted
 T = State-Listed Threatened C = Candidate for listing
 PT = Proposed Threatened

* = Species not recognized by the USFWS (according to “Official Species List”) as occurring within the project area but designated by TPWD as potentially occurring within the county.

† = Species not recognized by the TPWD (according to the Travis County List) as occurring within the project area but listed on the USFWS “Official Species List” for the project area.

Note: Pfeiffer et al., 2015 clarifies the genetic position of the false spike mussel, Lovette et al., 2010 does the same for the golden-cheeked warbler, and Johnson et al., 2018 does the same for the smooth pimpleback mussel. USFWS, 2017 refers to a different genus for the Tooth Cave spider.

The Texas Natural Diversity Database (TXNDD) was reviewed on April 4, 2019, to assess the potential for rare, threatened, or endangered species to occur within range of the proposed project limits (TXNDD, 2019). **Table 5** provides elements of occurrence (EO) within 1.5 miles of the project area for protected species and TPWD-tracked species. **Figure 9** displays the locations of EOs in relation to the OHP project area. The TXNDD is a database collection of recorded occurrences that cannot be interpreted as presence/absence data. Since the Final EIS/ROD was issued in 2018, a single verified EO was added with overlapping boundaries to the project area: #6843, Bracted twistflower (EO ID 6843).

Table 5: Results from Review of the Texas Natural Diversity Database

| Element Occurrence # | Scientific Name | Common Name | Status | Last Observation |
|----------------------|--------------------------------------|----------------------------|--------|------------------|
| 12789 | <i>Conepatus leuconotus</i> | American hog-nosed skunk | -- | 1964 |
| 10652 | <i>Matelea sagittifolia</i> | Arrowleaf milkvine | SGCN | 1984 |
| 5625 | <i>Vireo atricapilla</i> | Black-capped Vireo | DL | 1994 |
| 1782 | <i>Vireo atricapilla</i> | Black-capped Vireo | DL | 1983 |
| 6843 | <i>Streptanthus bracteatus</i> | Bracted twistflower | C | 2018 |
| 8195 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 1991 |
| 7576 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 2000 |
| 6983 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 2000 |
| 5617 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 1992 |
| 5447 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 1992 |
| 1882 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 1989 |
| 1499 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 1992 |
| 871 | <i>Setophaga chrysoparia</i> | Golden-cheeked Warbler | LE | 2000 |
| 6485 | <i>Onosmodium helleri</i> | Heller's false gromwell | SGCN | 1983 |
| 4475 | <i>Onosmodium helleri</i> | Heller's false gromwell | SGCN | 1943 |
| 9575 | <i>Holbrookia lacerata</i> | Spot-tailed earless lizard | SGCN | 1953 |
| 11065 | <i>Festuca versuta</i> | Texas fescue | SGCN | 1917 |
| 10999 | <i>Festuca versuta</i> | Texas fescue | SGCN | 1999 |
| 6994 | <i>Thamnophis sirtalis annectens</i> | Texas garter snake | SGCN | 1942 |

Source: TXNDD, 2019

Status Codes: LE = Federally Listed Endangered
 LT = Federally Listed Threatened

SGCN = Species of Greatest Conservation Need
 DL = Delisted

7.1 Federally-Listed Species

According to the USFWS (2019) and TPWD (2019) data, 25 species federally-listed as threatened, endangered, or as candidates for listing have the potential to occur in Travis County. Initial field investigations were performed in the spring and winter of 2016. The Final EIS and ROD documented that that the project area contains potentially suitable habitat for three federally-listed endangered

species (Barton Springs salamander, Austin blind salamander, and Bee Creek Cave harvestman) and one candidate species (bracted twistflower). Analysis of the potential effects to these species is provided in the Final EIS and associated technical reports. TxDOT concluded that the project had the potential to affect, but not adversely affect, the Barton Springs salamander and the Austin blind salamander. TxDOT completed informal consultation in December 2017 with the USFWS and received concurrence on the above effect determinations. New information regarding the distribution of the Barton Springs salamander was published in March 2018 and TxDOT coordinated with the USFWS regarding this new occurrence data in November and December 2018. In light of this new information and TxDOT's commitment to the net reduction of total suspended solids (TSS) leaving the site, USFWS agreed that their December 20, 2017 concurrence letter remained valid.

The USFWS's concurrence letter stated that no further consultation regarding endangered species would be required unless:

- 1) The identified action is subsequently modified in a manner that causes an adverse effect on any listed species or designated critical habitat;
- 2) New information reveals the identified action may affect federally protected species or designated critical habitat in a manner or to an extent not previously considered;
- 3) A new species is listed or a critical habitat is designated under the Act that may be affected by the identified action;
- 4) Additional federally protected species are identified in the project area or,
- 5) The project is not completed within four years of the date of this consultation.

The proposed design revisions would not affect TxDOT's TSS reduction commitments, nor would it result in impacts not previously discussed during the consultation process. The revised GA identified one new sensitive recharge feature over the Contributing Zone of the Edwards Aquifer. It is likely that this feature would require closure or BMPs similar to those proposed for the other geologic features in the project area. Potential impacts to this feature are not anticipated to significantly alter the recharge or discharge characteristics of the project area. Additionally, no federally-listed salamanders or their habitats were identified during the 2019 site visits. Therefore, the 2019 reevaluation is not anticipated to require additional coordination/consultation with the USFWS, nor would it result in adverse effects to federally-listed species or critical habitat. All voluntary conservation measures identified in the 2017 concurrence letter from the USFWS remain in effect for the 2019 reevaluation.

7.2 State-Listed Species

In addition to the federally-listed/candidate species described above in **Table 4**, 14 additional species designated by TPWD (2019) as state-threatened or endangered have the potential to occur in Travis County (false spike mussel, Blue Sucker, Western Creek Chubsucker, Texas horned lizard, Texas tortoise, timber rattlesnake, American Peregrine Falcon, Peregrine Falcon, Bald Eagle, Black-capped Vireo, Swallow-tailed Kite, White-faced Ibis, Wood Stork, and Zone-tailed Hawk). Eight of which (Blue Sucker, Western Creek Chubsucker, Texas tortoise, timber rattlesnake, Swallow-tailed

Kite, White-faced Ibis, Wood Stork, and Zone-tailed Hawk) have been added to the TPWD County list since the issuance of the 2018 Final EIS/ROD. Of these eight additional species, only the Texas tortoise was determined to have potentially suitable habitat within the project area during the 2019 field investigations and may be impacted as a result of the proposed project. Analysis of the potential effects to the remaining species is provided in the Final EIS and associated technical reports. None of these species were observed during field visits in 2016 or 2019.

7.3 Species of Greatest Conservation Need

Table 4 also lists species with no regulatory status that are considered species of greatest conservation need (SGCN) in Texas that could occur within Travis County. At the time the Final EIS/ROD was prepared, TPWD designated 42 SGCN species as having the potential to occur in Travis County that are not listed as candidates or federally protected under the Endangered Species Act. Of these 42 species, suitable habitat occurs within the project area for 18 plants, 2 mammals, 1 fish, and 1 reptile as determined by qualified biologists during visual surveys in January, May, and June 2016 and reconfirmed in March 2019. Analysis of the potential effects to these species is provided in the Final EIS and associated technical reports. In April 2019, TPWD revised the Travis County list to include additional SGCN species. Coordination with TPWD for this project was completed in 2018. Although several design revisions are proposed as a result of the 2019 reevaluation, no additional coordination with TPWD is required as explained in **Section 9**. Additionally, because SGCNs are not afforded regulatory protection under state or federal law, potential impacts to recently added SGCN species are not evaluated in this report.

Potential construction phase impacts to the four animal species (cave myotis bat, plains spotted skunk, Guadalupe Bass, and Texas garter snake) would be temporary and limited to the construction period of the OHP Project. The approximately 123.48 acres of vegetation that is proposed for removal or conversion to transportation use would permanently eliminate these areas from being suitable habitat for sheltering or foraging. Due to the mobility of these species, the current fragmentation of habitat within the project area, and the proximity of higher quality suitable habitat adjacent to the US 290/SH 71 project area, impacts to these species are not anticipated to result in long-term effects to the species as a whole. Species-specific BMPs, as identified in **Table 6**, would be utilized to minimize construction impacts to species and their potential habitat within the project area. For the 18 plant species that may occur within the project area, direct impacts associated with vegetation removal, including physical destruction of individual plant populations, would be permanent within the area of disturbance. While direct impact to individuals or populations of these species may occur as a result of construction activities, these impacts would be limited to areas that are necessary to accommodate the additional pavement width, sidewalks, bridges, and detention ponds. All vegetation removal would be limited to the amount practicable for the project construction.

None of the SGCN species were observed during field visits; therefore, no significant impacts to SGCNs are anticipated from the 2019 design revisions or as a result of construction of the proposed project.

8. PRESERVE AND CONSERVATION LANDS

The Barton Creek Habitat Preserve is located approximately 0.35-miles from the proposed project area just east of US 71 and north of Southwest Parkway. This 4,084-acre preserve is positioned along Barton Creek and serves to protect the habitat of the federally delisted Black-capped Vireo and Golden-cheeked Warbler that nest in Central Texas. The Preserve is protected and managed by the Nature Conservancy as part of the Balcones Canyonland Conservation Plan (BCCP), which was developed to conserve habitat amidst the growth of the Austin area (The Nature Conservancy, 2016).

No additional preserves or conservation lands were identified within the project area. Therefore, no impacts to preserve or conservation lands are anticipated from the 2019 design revisions or as a result of construction of the proposed project.

9. TEXAS PARKS AND WILDLIFE COORDINATION

In accordance with the TxDOT-TPWD MOU effective September 1, 2013, a Tier I Site Assessment was completed in order to determine impacts and the need for coordination with TPWD. The Tier I Site Assessment concluded that the proposed project exceeded several of the MOU coordination triggers and coordination with TPWD would be required. TPWD reviewed and commented on the Draft EIS on June 18, 2018, and TxDOT responded to TPWD’s comments on July 18, 2018. These coordination efforts documented compliance with the requirements of the TxDOT-TPWD MOU.

Per the MOU, for projects that have previously completed coordination with TPWD, no additional coordination is required unless:

- The project revisions relate to an issue for which TPWD previously comments on, or
- A substantial change is proposed from the original coordination or new impacts now exceed a threshold.

Although several design revisions are proposed as a result of the 2019 reevaluation, neither of the above conditions would be met; therefore, no additional coordination with TPWD is required. The previously agreed upon BMPs (listed below) would remain in effect for the reevaluation. An additional BMP for the Texas tortoise has been added to the project commitments.

Table 6: BMPs for State-Listed Species and SGCNs

| Species Name | BMP |
|----------------------|---|
| Plains spotted skunk | <ul style="list-style-type: none"> • Contractors will be advised of potential occurrence in the project area, to avoid harming the species if encountered, and to avoid unnecessary impacts to dens. |
| Guadalupe Bass | <ul style="list-style-type: none"> • For projects within the range of a SGCN or state-listed fish, and work is in the water: TPWD coordination required. |

| Species Name | BMP |
|--------------------|--|
| Texas garter snake | <ul style="list-style-type: none"> • Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable. • For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling. • Inform contractors that if reptiles are found on project site allow species to safely leave the project area. • Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible. • Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. |
| Texas tortoise | <ul style="list-style-type: none"> • Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. • Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species • Terrestrial Reptile BMPs <ul style="list-style-type: none"> • Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable. • For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling. • Inform contractors that if reptiles are found on project site allow species to safely leave the project area. • Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible. |

| Species Name | BMP |
|-----------------|--|
| Cave myotis bat | <p>All bat surveys and other activities that include direct contact with bats shall comply with TPWD-recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under “Project Design and Construction”.</p> <p>The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.</p> <ul style="list-style-type: none"> • For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting. • For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats. • If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction. • Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50 °F AND minimum daytime temperatures are above 70 °F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Section 2: Standard Recommendations for recommended acceptable methods for excluding bats from structures. • If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable. • Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible. • Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape. • Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible. • In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD. |

Source: TxDOT-TPWD MOU September 2013.

In addition to the species-specific BMPs, the following generic taxa or resource BMPs would be followed:

Migratory Bird BMPs

- The disturbance, destruction, or removal of active nests, including ground nesting birds, during the nesting season would be prohibited.
- The removal of unoccupied, inactive nests would be avoided as practicable.

- The establishment of active nests during the nesting season on TxDOT-owned and -operated facilities and structures proposed for replacement or repair would be prevented.
- The collection, capture, relocation, or transportation of birds, eggs, young, or active nests without a permit would be prohibited.

10. CONCLUSIONS

This Biological Resources Technical Addendum has been prepared to document new ecological impacts resulting from the 2019 design changes. Additionally, this addendum includes the results of field investigations conducted along portions of the proposed right-of-way where access to previously unsurveyed parcels has been granted. The results of the additional analysis and site visits are summarized below:

- The natural setting and land use of the project area would not be substantially changed from what was presented in the Final EIS/ROD as a result of the 2019 reevaluation.
- Six new geologic features were identified in the 2019 revised GA. Only one of these features has been evaluated as sensitive. Geologic resources within the project area would receive impacts from construction activities, no new impacts are anticipated as a result of the 2019 design revisions. Because the project area has been heavily modified by long-term development, impacts to geology and soils resulting from the OHP Project would be largely consistent with the continued operation and maintenance of the existing facility. Due to the higher TSS removal proposed for the project, some water quality impacts could be mitigated by the proposed BMPs identified in **Section 3.1** above and the Final EIS/ROD.
- A wetland/waters of the U.S. delineation was conducted in March 2019. This effort documented additional water features (one stream, two open water features, and one wetland) that were not discussed in the Final EIS/ROD. No significant impacts to waters of the U.S. or wetlands, are anticipated as a result of the proposed design revisions. Wetland/Waters impacts are discussed in *Oak Hill Parkway Water Resources Technical Report Addendum* (TxDOT, 2019).
- As a result of the 2019 design revisions, vegetation impacts within the OHP project area have increased by approximately 6.27 acres. No new vegetation communities, unusual vegetation, or special habitat features would be impacted as a result of the 2019 design revisions. Final tree impacts would be calculated once design is finalized.
- Several small passerine nests were identified during the additional site investigations in 2019. In the event that nesting migratory birds are encountered on-site during project construction, every effort would be made to avoid protected birds, active nests, eggs, and/or young. The contractor will be advised of the potential to find nesting migratory birds within the project area and will be instructed to avoid harming these species. No additional impacts to migratory birds are anticipated as a result of the 2019 design revisions.

- No change in compliance with the Bald and Golden Eagle Protection Act, Executive Order 13112, Executive Memorandum on Beneficial Landscaping, FPPA, FWCA, or Coastal Regulations are anticipated as a result of the 2019 design revisions.
- TxDOT completed consultation in December 2017 with the USFWS and received concurrence on the effect determinations for the BSS and ABS. No federally-listed species were identified within the project area during field investigations in 2016 or 2019. No additional coordination with the USFWS regarding the 2017 concurrence is anticipated as a result of the reevaluation.
- All species impact/effect determinations were reassessed as a result of the 2019 design revisions. No change to the species calls for federal-listed or SGCNs were made as a result of the additional site visits or design changes. As a result of TPWD revising their Travis County rare species list, the Texas tortoise was determined to have potentially suitable habitat within the project area. A BMP has been added to address potential impact to this species. No additional coordination with USFWS or TPWD is anticipated.

All biological permits and commitments identified in the Final EIS/ROD are valid and will be incorporated into the 2019 reevaluation. No additional permits, or commitments have been identified as a result of the 2019 design changes.

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Attachment A: Figures

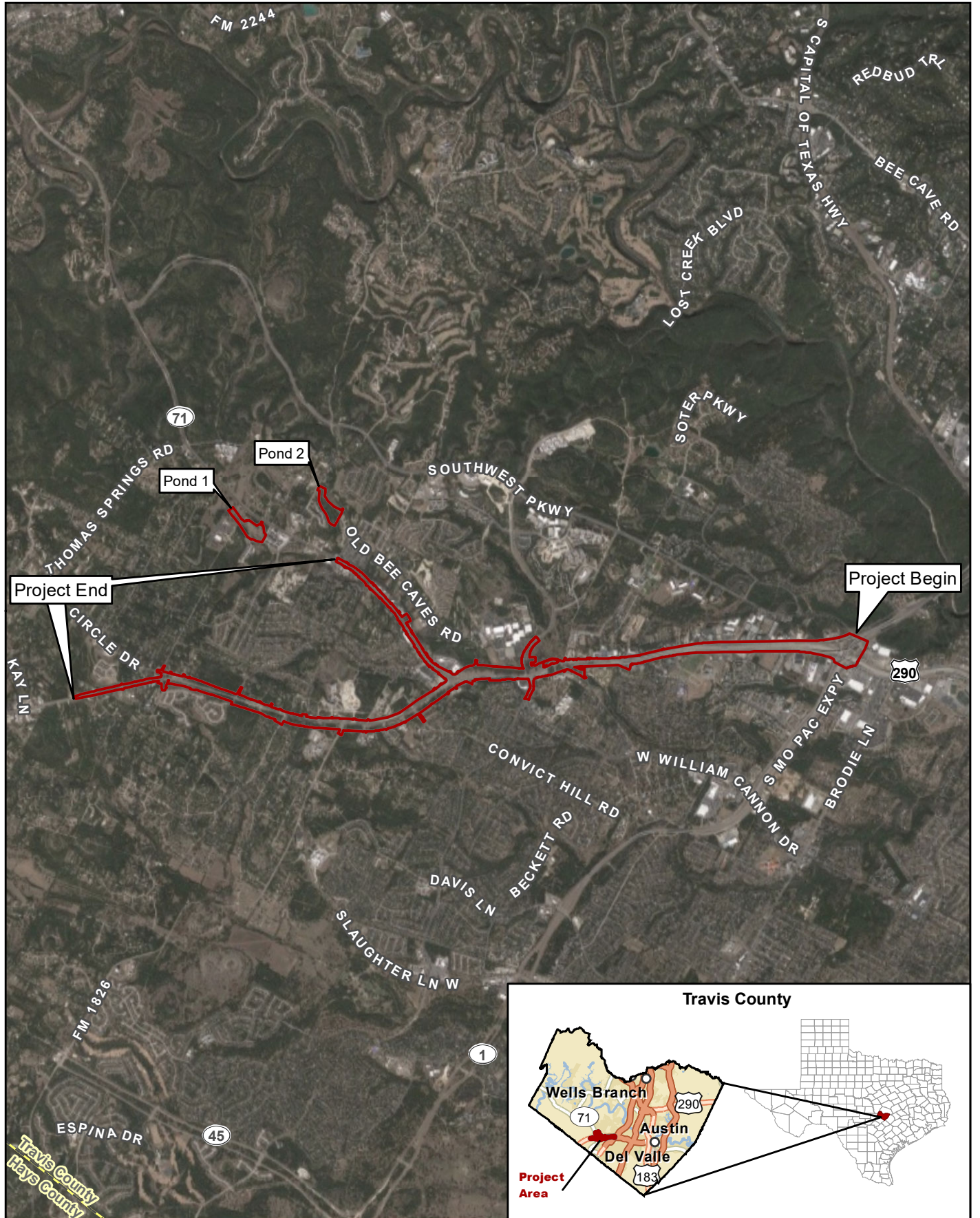
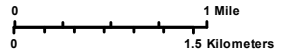


Figure 1. Project Location (Aerial Base)

Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290 to Silvermine Drive

Project Location



| | |
|---------------------|----------------|
| Prepared for: TxDOT | 1 in = 1 mile |
| Scale: 1:63,360 | Date: 5/7/2019 |

Basemap Source: Google (2018)

CSJ: 0013-08-060 and 0700-03-077

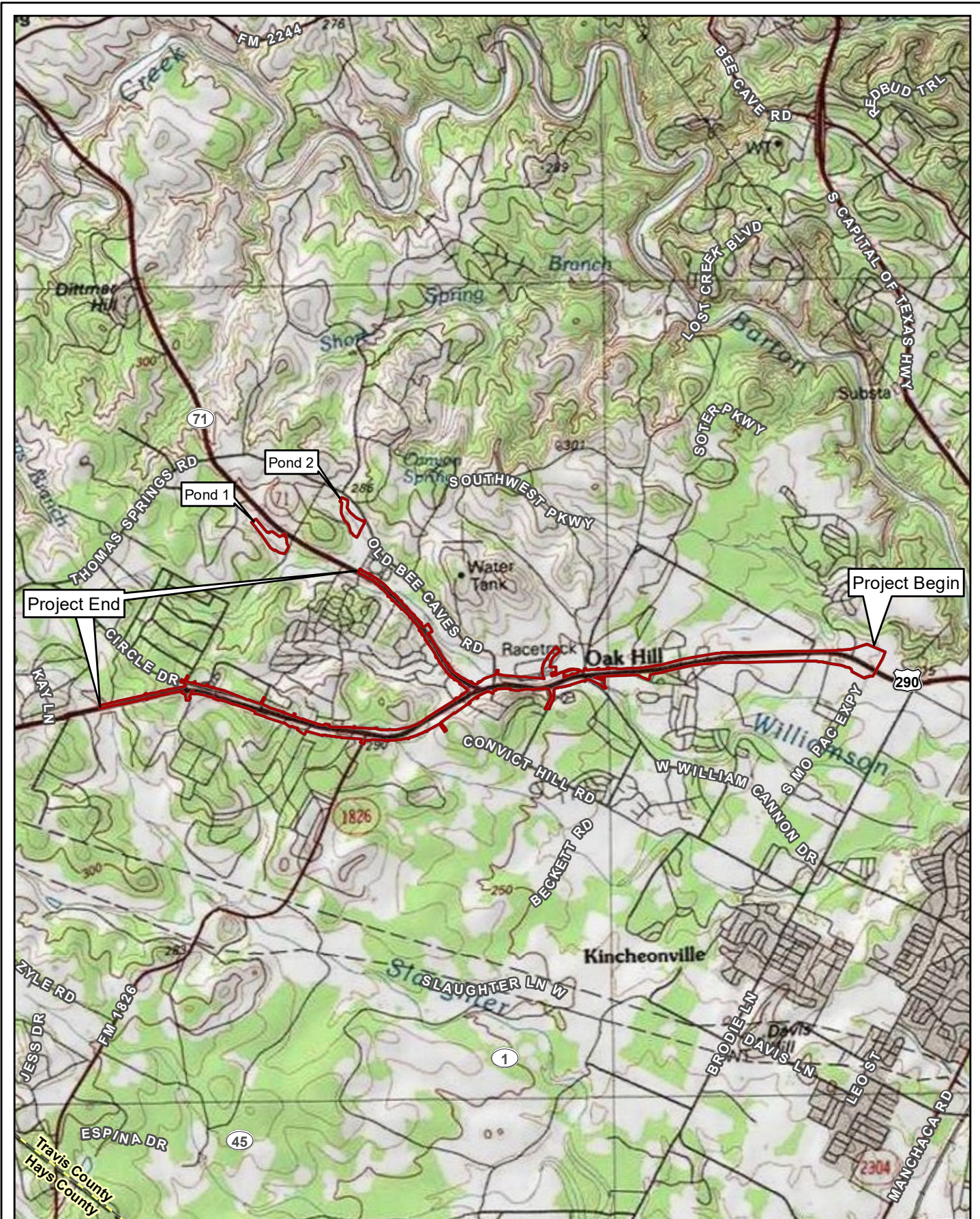


Figure 2. Project Location (Topographic Base)

Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290 to Silvermine Drive

 Project Location



0 1 Mile
0 1.5 Kilometers

Prepared for: TxDOT
1 in = 1 mile
Scale: 1:63,360
Date: 5/7/2019

Topographic Source: USGS Austin, Texas
30' x 60' Quadrangle (1985)

CSJ: 0013-08-060 and 0700-03-077

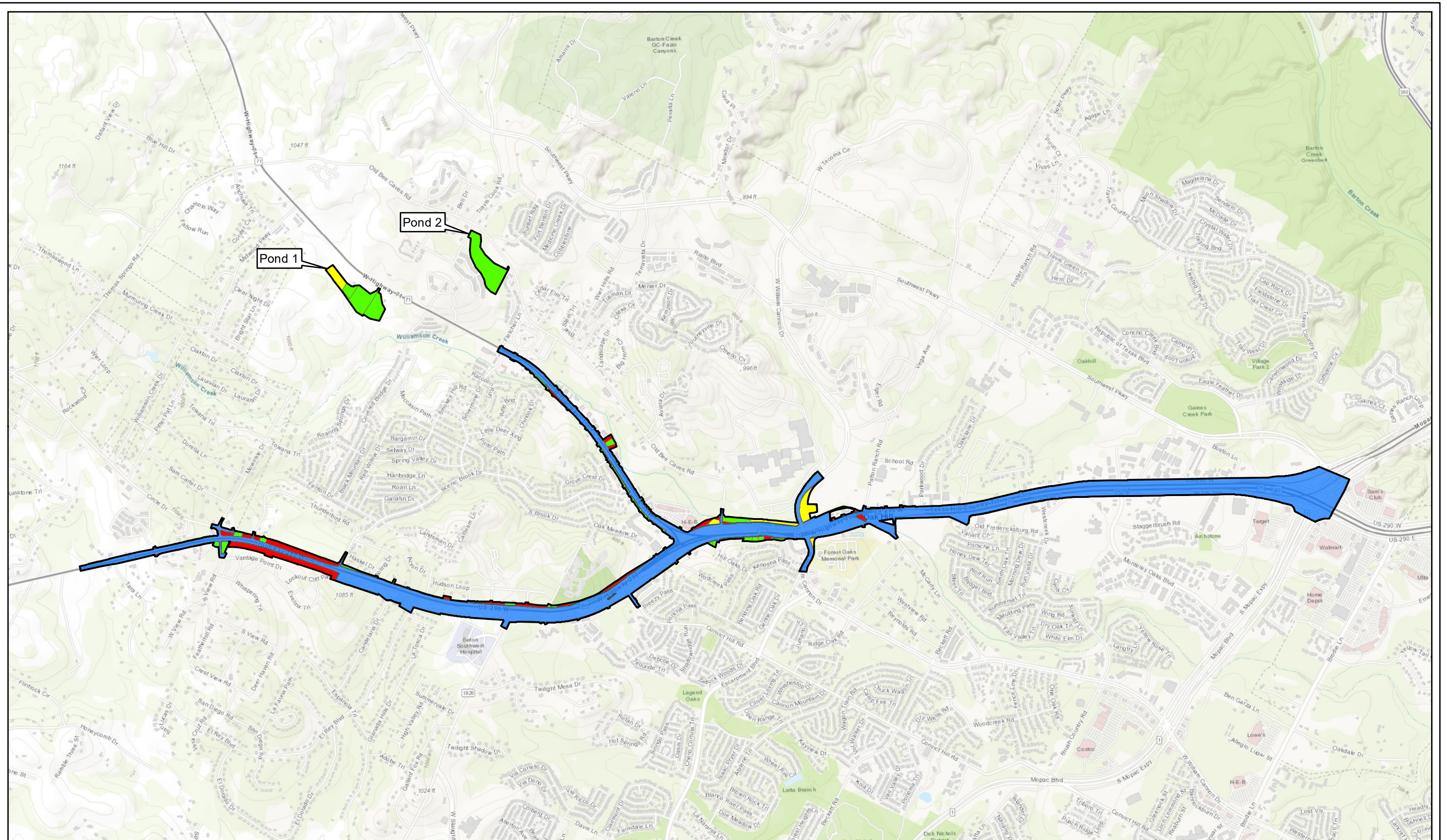


Figure 3. Right-of-Entry
Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

- Project Location
- Previous Right-of-Entry
- No Right-of-Entry
- Existing Right-of-Way
- 2019 Right-of-Entry

| | |
|--|--|
| | 0 2,250 Feet |
| | 0 750 Meters |
| Data Sources: TCAD (2016, 2018), TxDOT (2016), HDR (2019) Basemap Source: ESRI (2019) | Prepared for: TxDOT Scale: 1:27,000 Date: 5/7/2019 |

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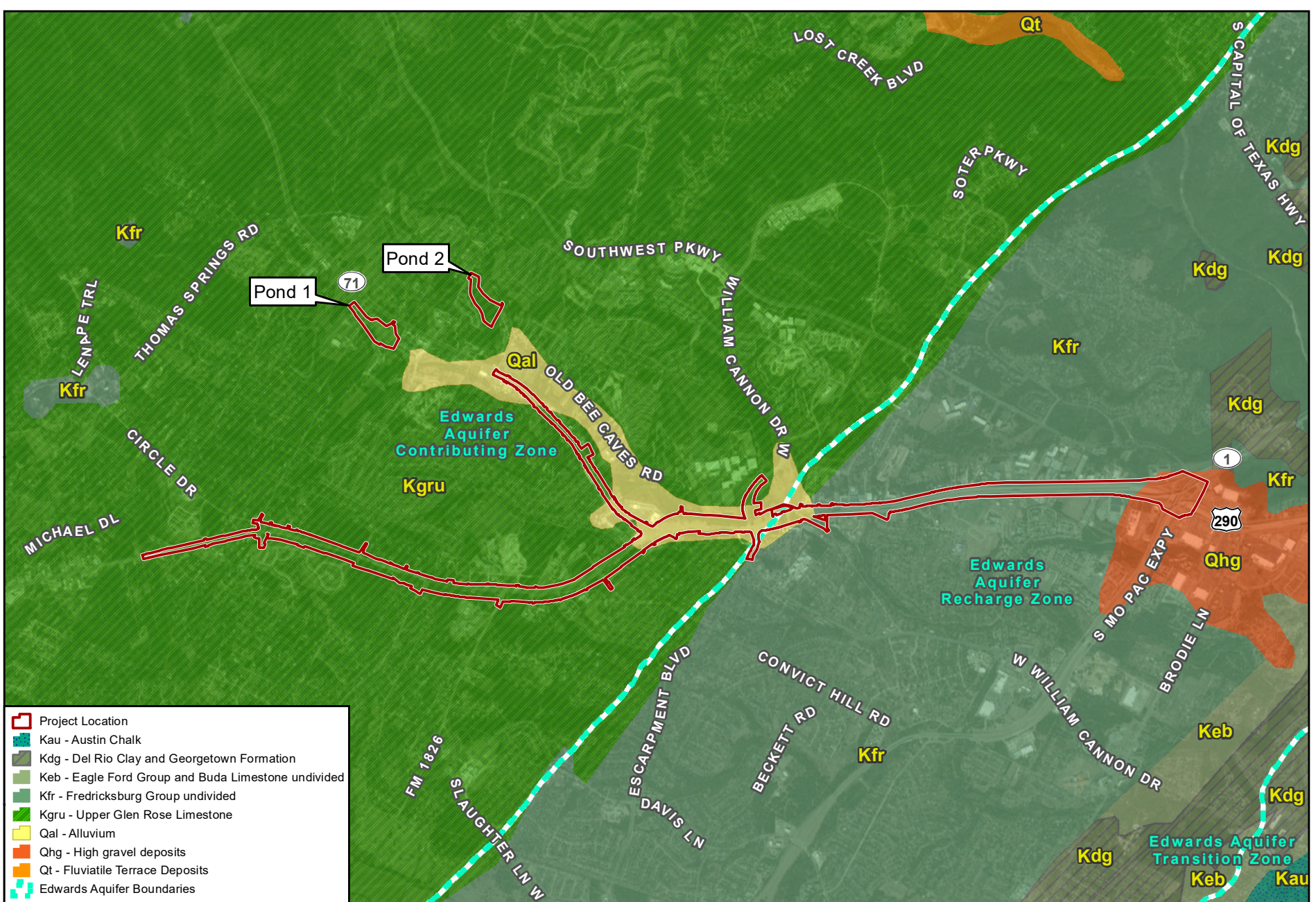
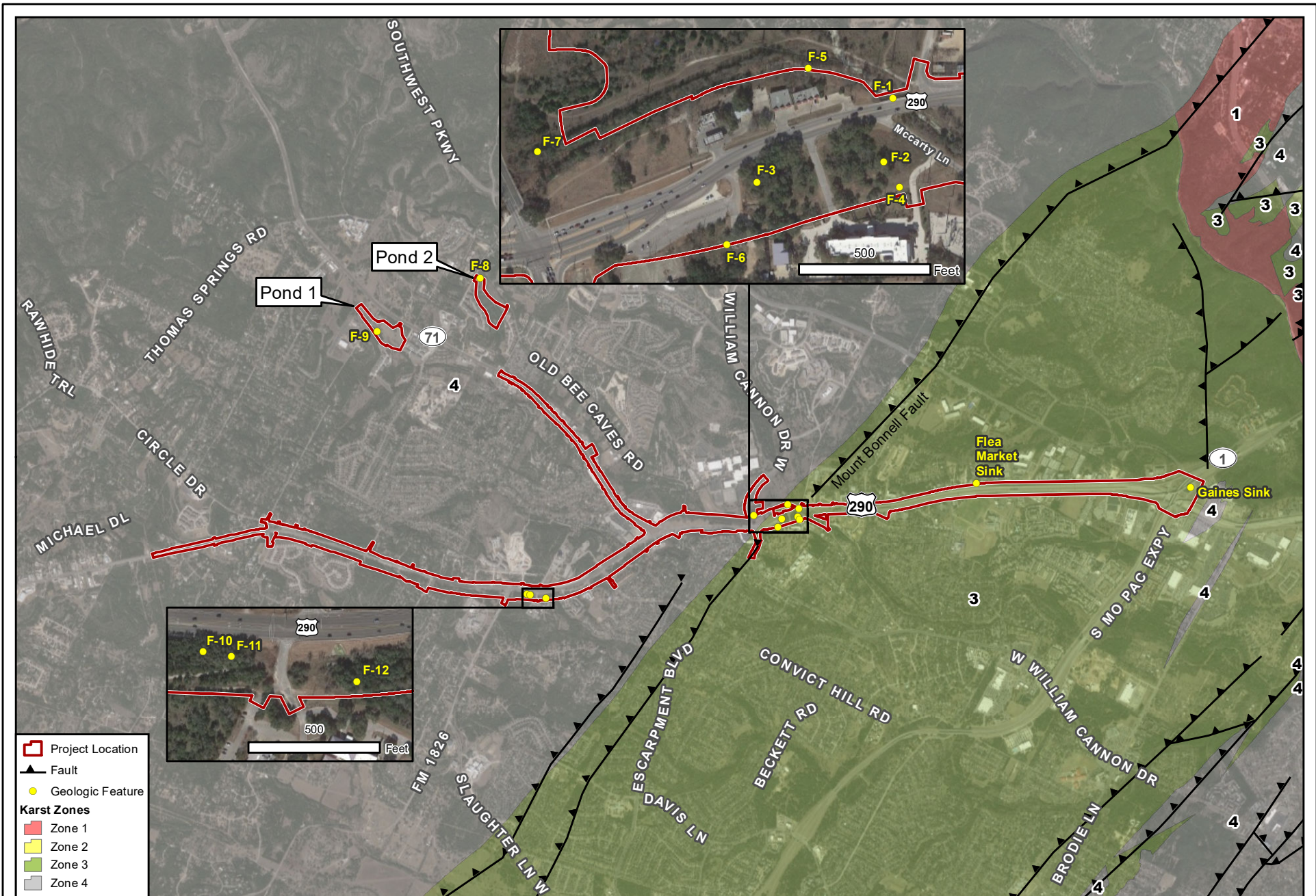


Figure 4. Project Area Geology

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

Data Sources: Geologic Database of Texas (2007)
 Geologic Atlas of Texas Austin Sheet (1981), TCEQ (2005)
 Aerial Source: Google (2018)

| | | |
|----------------------------------|------------------|-------------|
| | 0 | 0.75 Mile |
| | 0 | 1 Kilometer |
| Prepared for: TxDOT | 1 in = 0.75 mile | |
| | Scale: 1:47,520 | |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 5/8/2019 | |



- ▭ Project Location
 - ▲ Fault
 - Geologic Feature
- Karst Zones**
- ▭ Zone 1
 - ▭ Zone 2
 - ▭ Zone 3
 - ▭ Zone 4

Figure 5. Geologic Features and Karst Zones

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

Data Sources: Geologic Database of Texas (2007), Veni (2007), HDR (2019)
Aerial Source: Google (2018)

| | |
|----------------------------------|------------------|
| | 0 0.75 Mile |
| | 0 1 Kilometer |
| Prepared for: TxDOT | 1 in = 0.75 mile |
| Scale: 1:47,520 | Date: 5/8/2019 |
| CSJ: 0013-08-060 and 0700-03-077 | |

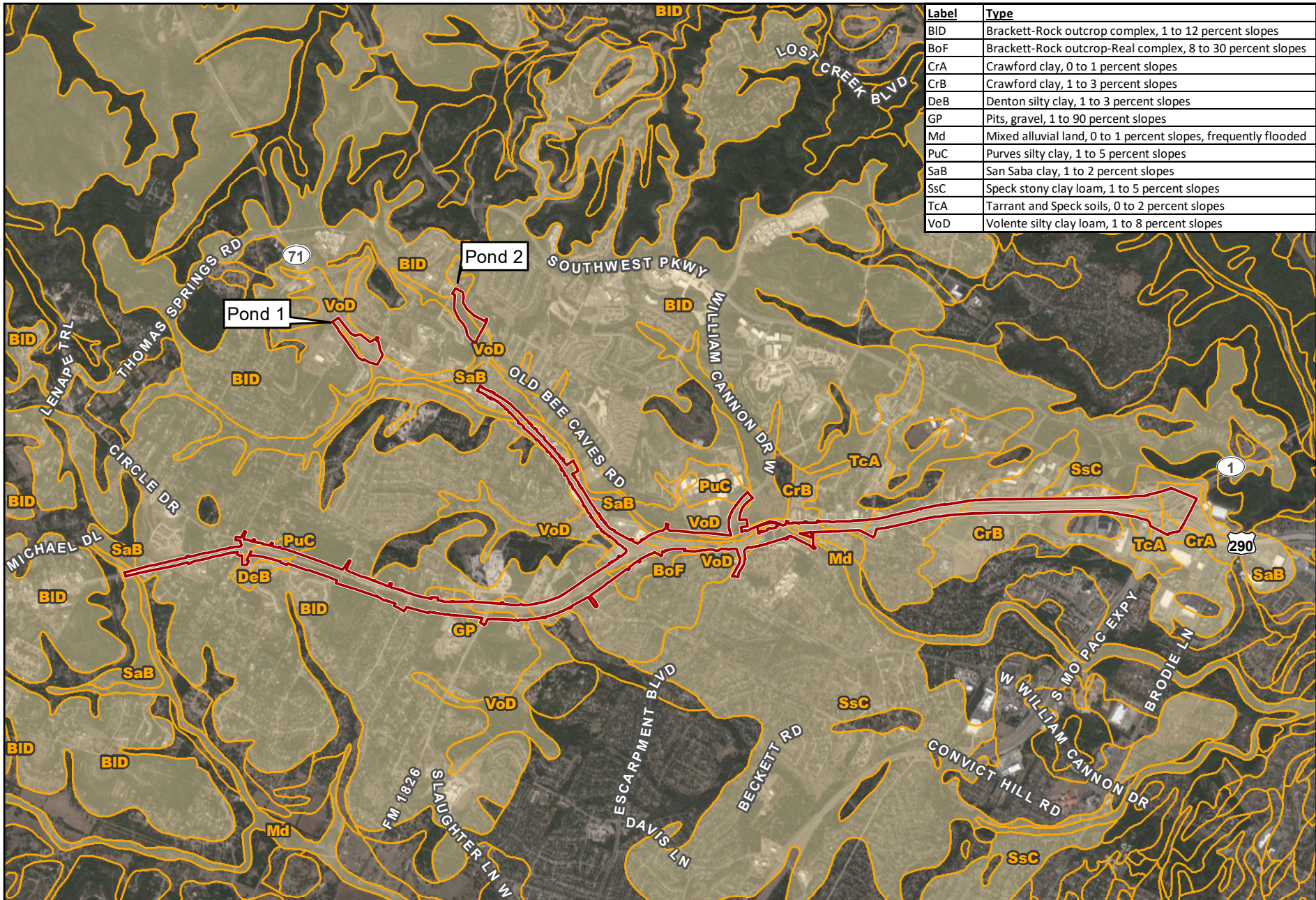


Figure 6. Project Area Soils

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

- Project Location
- Intersecting Soil
- Soil Unit Boundary

Data Source: NRCS (2018)
Aerial Source: Google (2018)

0 0.75 Miles
1 Kilometer

Prepared for: TxDOT
Scale: 1:47,520
Date: 5/8/2019

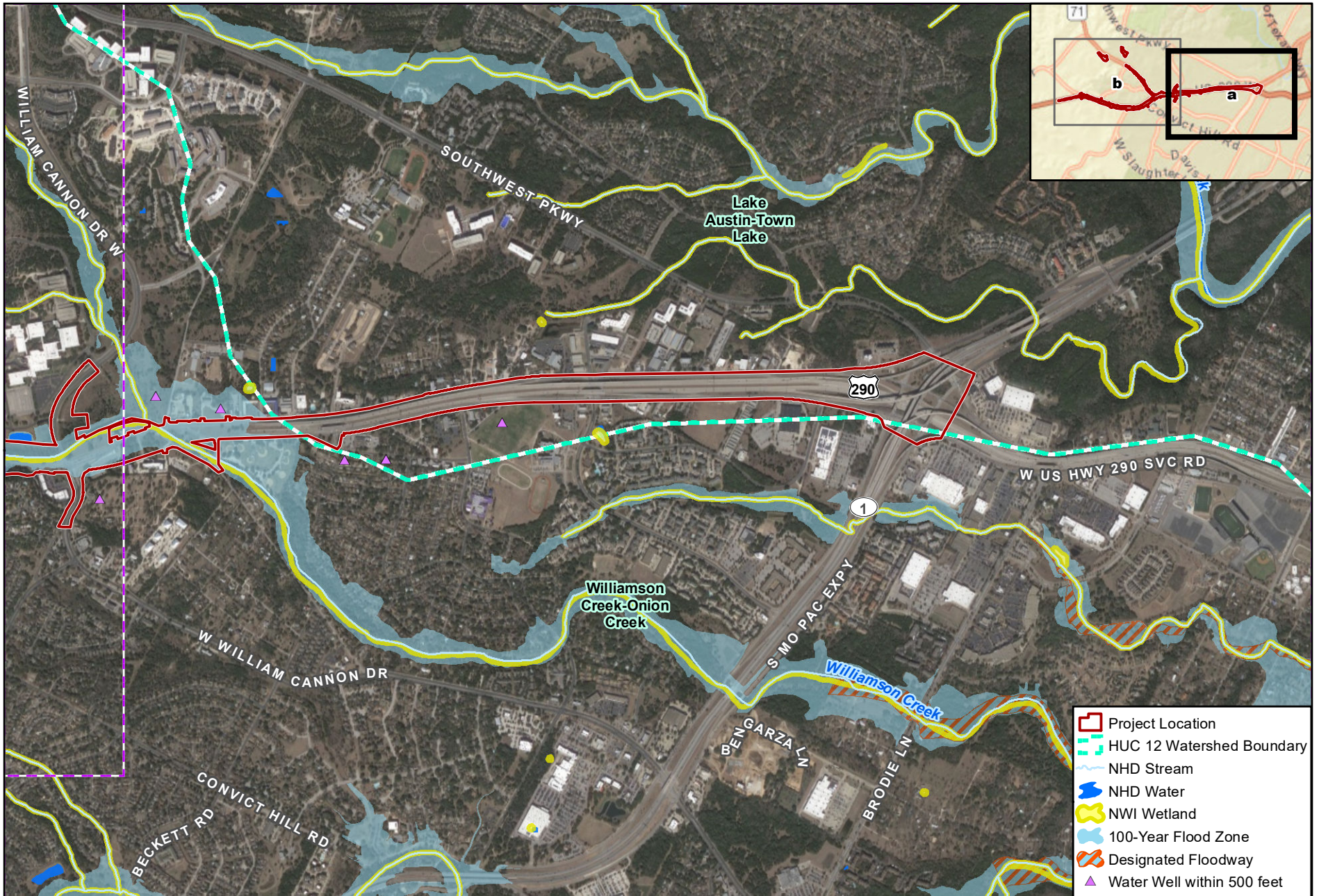


Figure 7a. Water Resources

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), TWDB (2019), HDR (2019)
Aerial Source: Google (2018)

| | | |
|----------------------------------|-------------------|------------|
| | 0 | 2,000 Feet |
| | 0 | 600 Meters |
| Prepared for: TxDOT | 1 in = 2,000 feet | |
| CSJ: 0013-08-060 and 0700-03-077 | Scale: 1:24,000 | |
| | Date: 5/8/2019 | |

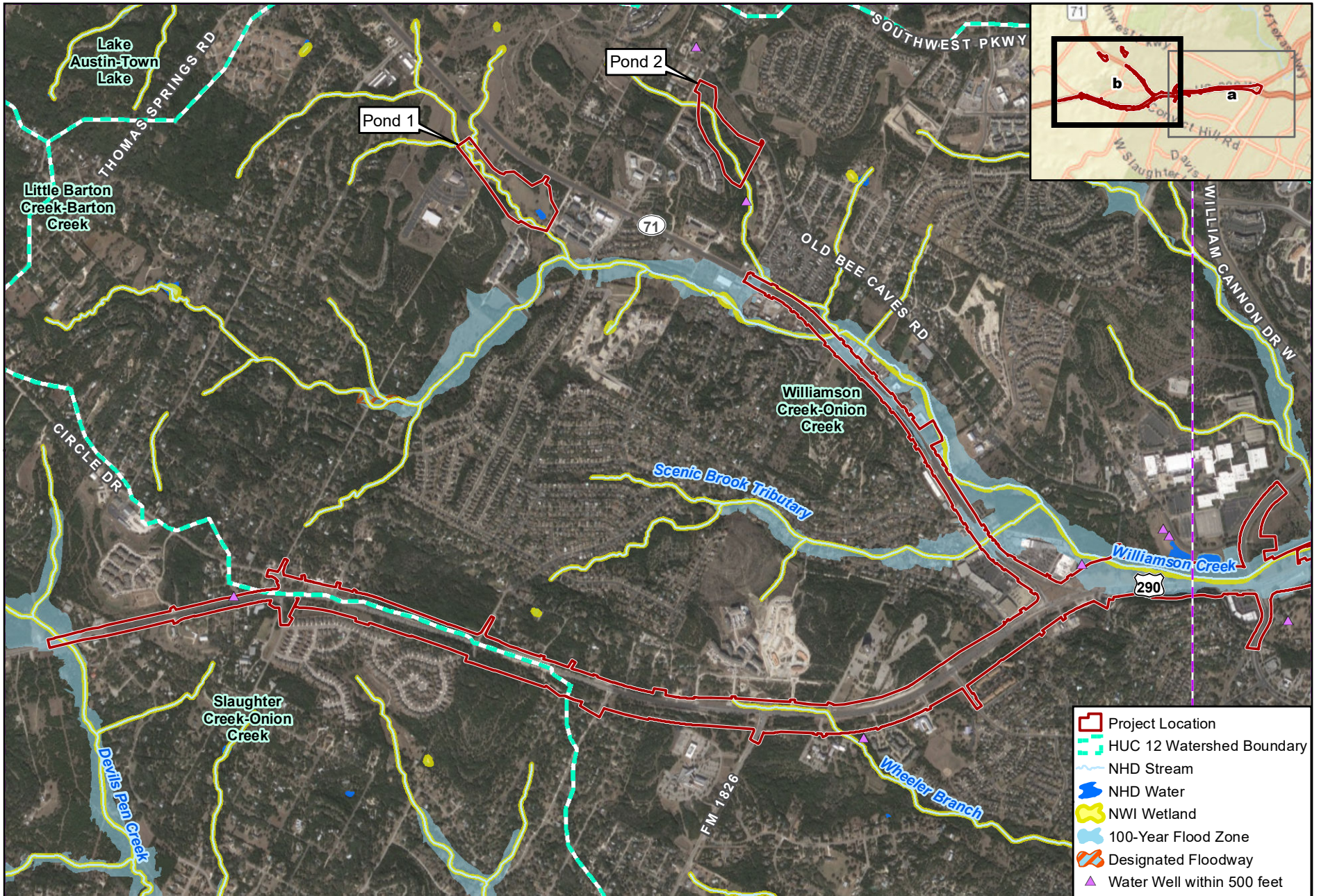


Figure 7b. Water Resources

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), TWDB (2019), HDR (2019)
Aerial Source: Google (2018)

| | | |
|----------------------------------|-------------------|------------|
| | 0 | 2,000 Feet |
| | 0 | 600 Meters |
| Prepared for: TxDOT | 1 in = 2,000 feet | |
| CSJ: 0013-08-060 and 0700-03-077 | Scale: 1:24,000 | |
| | Date: 5/8/2019 | |

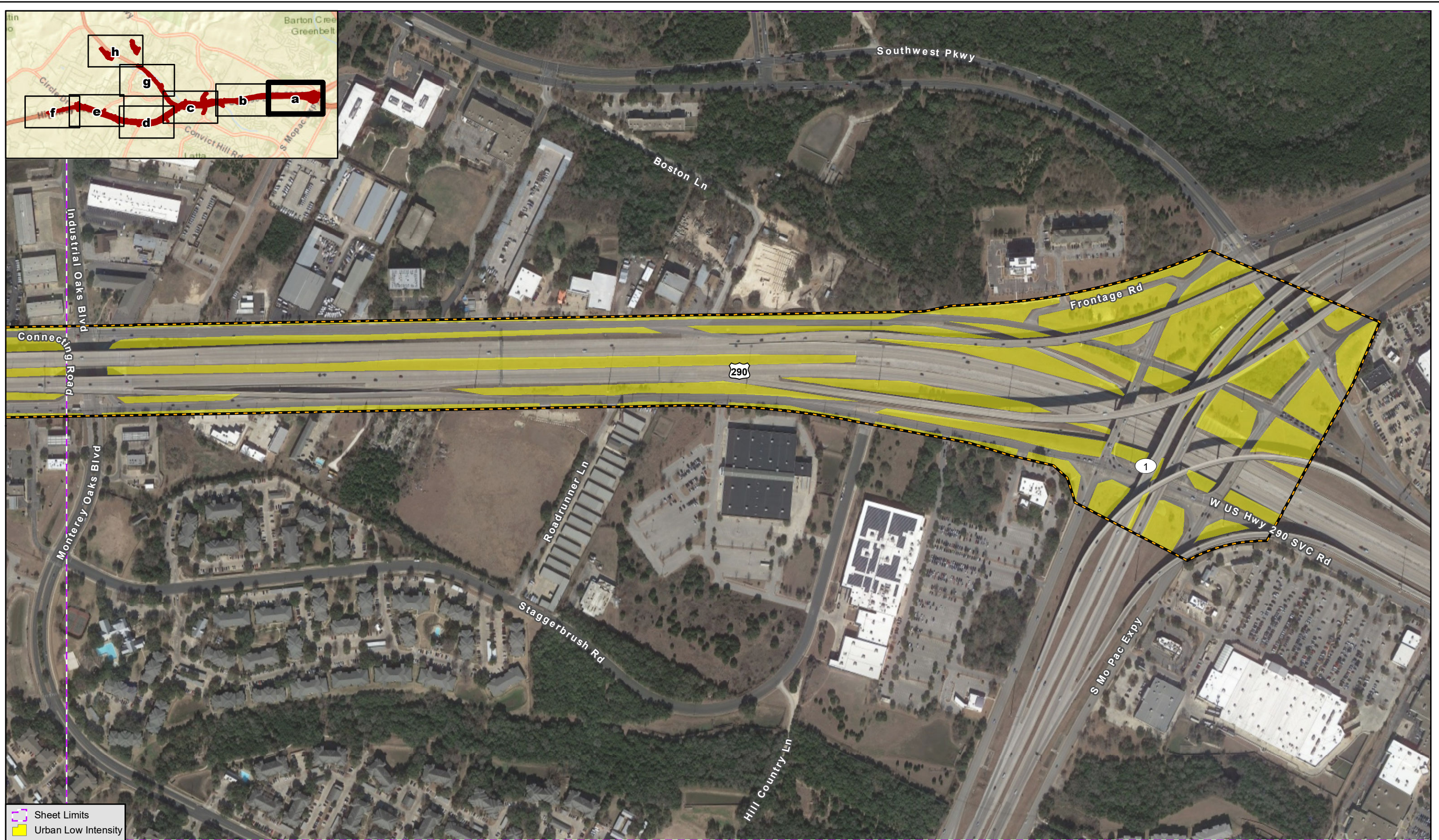


Figure 8a. Observed Vegetation Types

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

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Existing Right-of-Way

| | | |
|----------------------------------|-----------------|------------|
| | 0 | 400 Feet |
| | 0 | 120 Meters |
| Prepared for: TXDOT | 1 in = 400 feet | |
| Data Source: CMEC (2016) | Scale: 1:4,800 | |
| Aerial Source: Google (2018) | Date: 5/8/2019 | |
| CSJ: 0013-08-060 and 0700-03-077 | | |

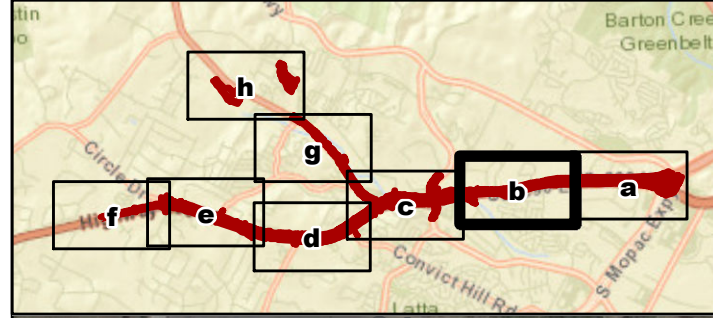


Figure 8b. Observed Vegetation Types
 Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Driveway License

| | | |
|--|---|---|
| | | |
| | Prepared for: TxDOT Data Source: CMEC (2016) Aerial Source: Google (2018) | 1 in = 400 feet Scale: 1:4,800 Date: 5/8/2019 |

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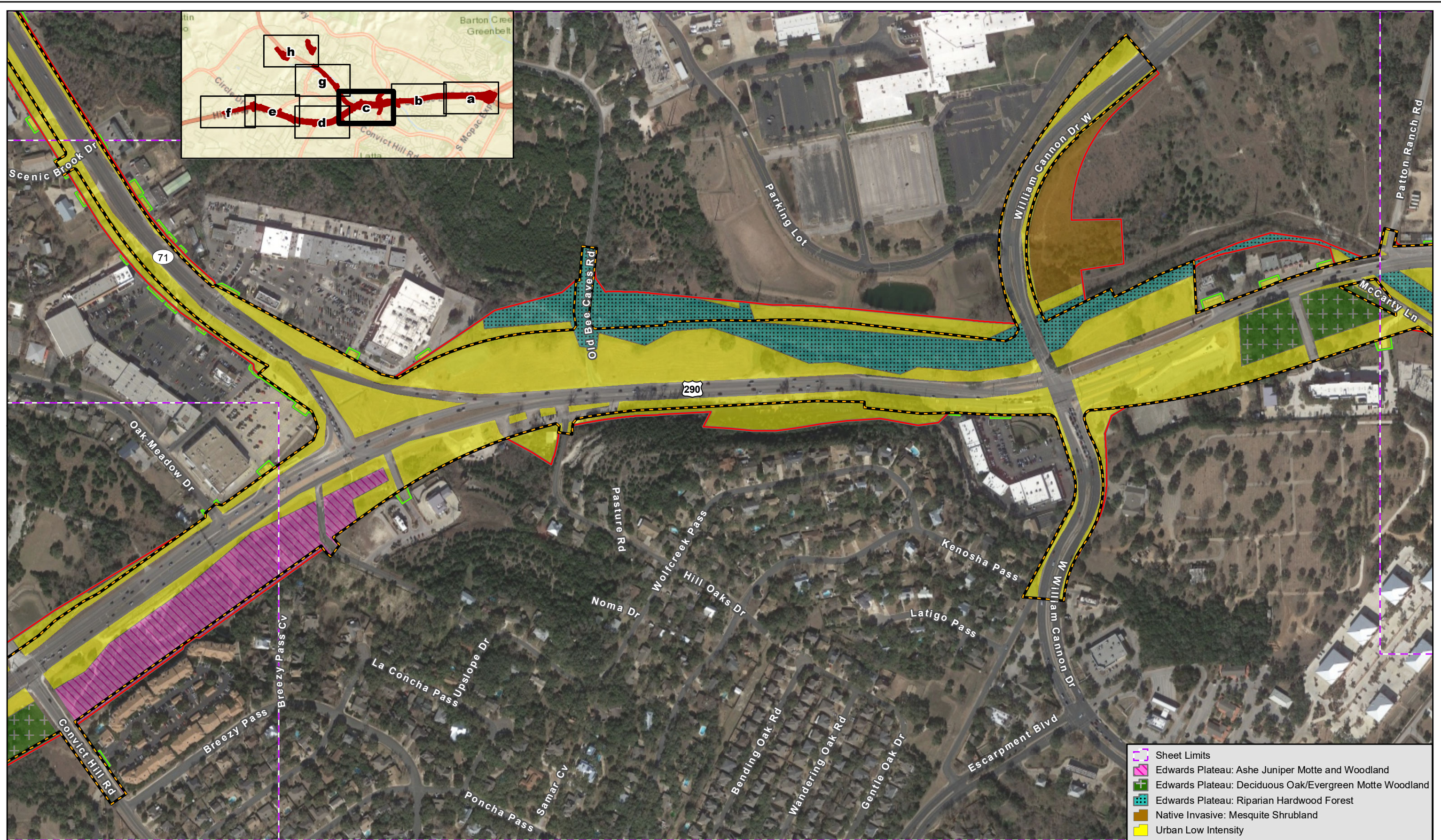








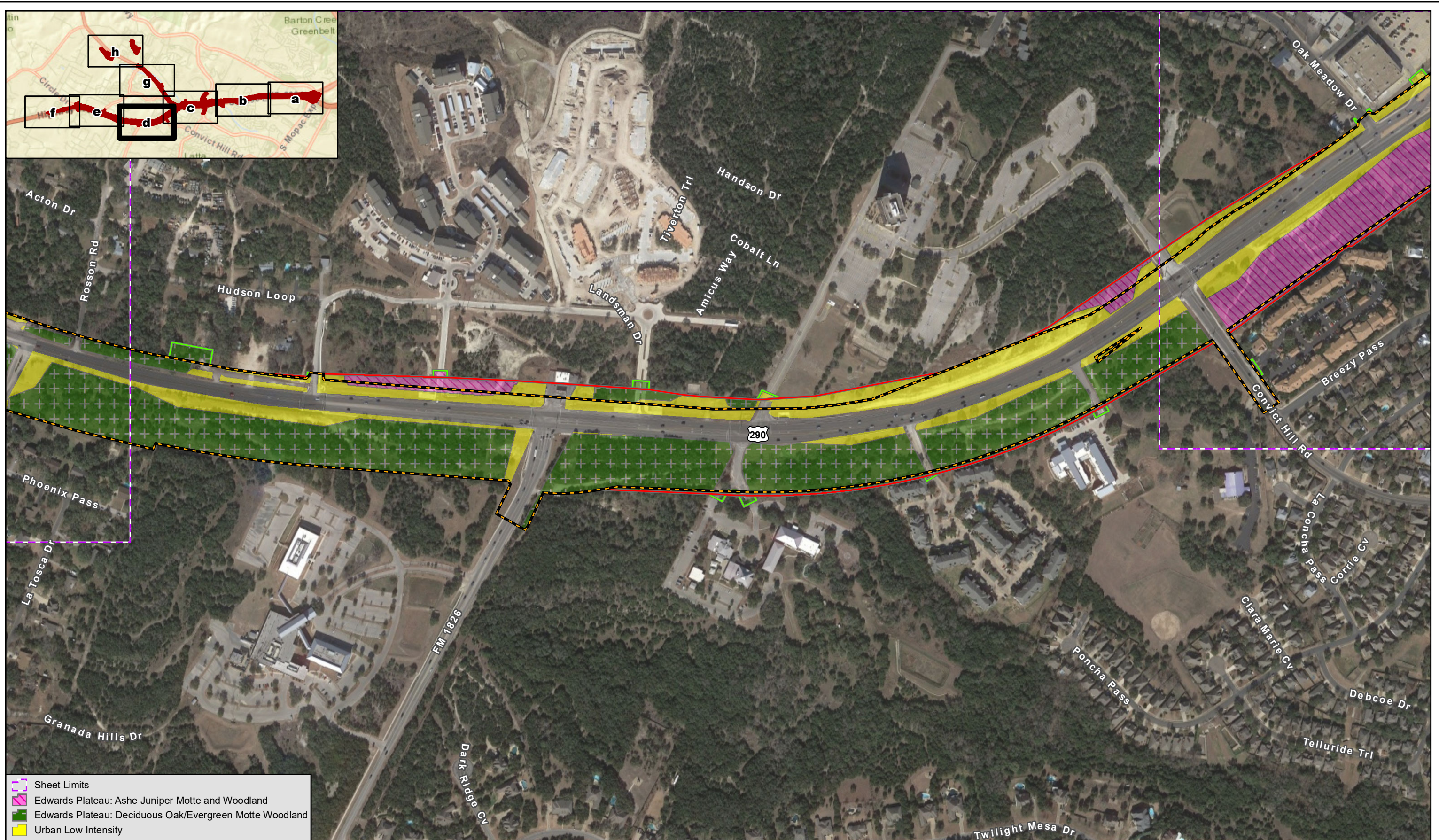
Figure 8c. Observed Vegetation Types

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

-  Existing Right-of-Way
-  Proposed Right-of-Way
-  Proposed Driveway License

-  Sheet Limits
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Deciduous Oak/Evergreen Motte Woodland
-  Edwards Plateau: Riparian Hardwood Forest
-  Native Invasive: Mesquite Shrubland
-  Urban Low Intensity

| | |
|---|--|
|  |   |
| | Prepared for: TxDOT Data Source: CMEC (2016) Aerial Source: Google (2018) CSJ: 0013-08-060 and 0700-03-077 Scale: 1:4,800 Date: 5/8/2019 |



- Sheet Limits
- Edwards Plateau: Ashe Juniper Motte and Woodland
- Edwards Plateau: Deciduous Oak/Evergreen Motte Woodland
- Urban Low Intensity

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Driveway License

Figure 8d. Observed Vegetation Types
 Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

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| | |
|----------------------------------|---------------------|
| | |
| Data Source: CMEC (2016) | Prepared for: TxDOT |
| Aerial Source: Google (2018) | Scale: 1:4,800 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 5/8/2019 |

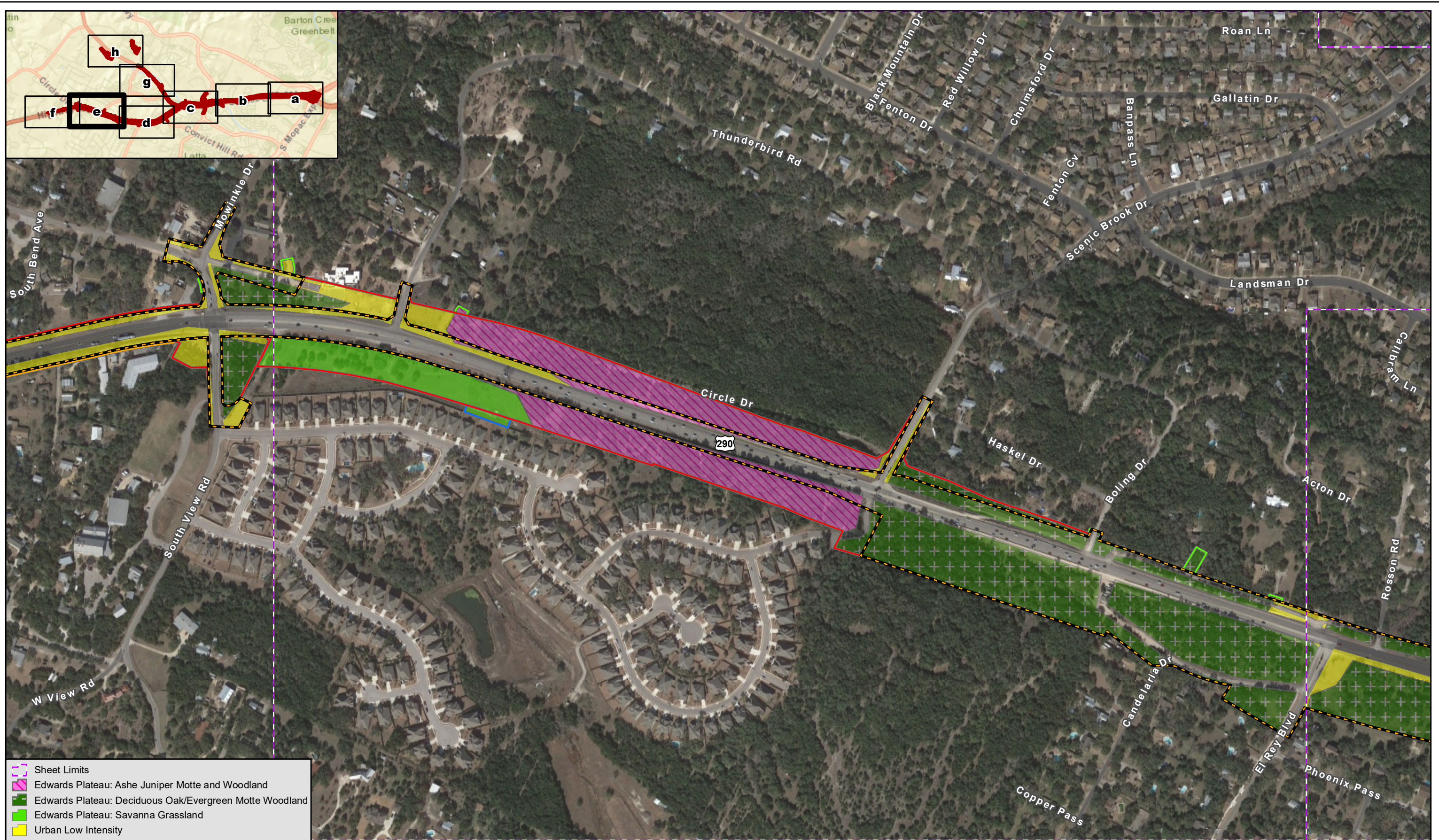


Figure 8e. Observed Vegetation Types
 Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Permanent Easement
- Temporary Construction Easement
- Proposed Driveway License

| | |
|----------------------------------|-----------------|
| | 0 400 Feet |
| | 0 120 Meters |
| Prepared for: TxDOT | 1 in = 400 feet |
| Data Source: CMEC (2016) | Scale: 1:4,800 |
| Aerial Source: Google (2018) | Date: 5/8/2019 |
| CSJ: 0013-08-060 and 0700-03-077 | |

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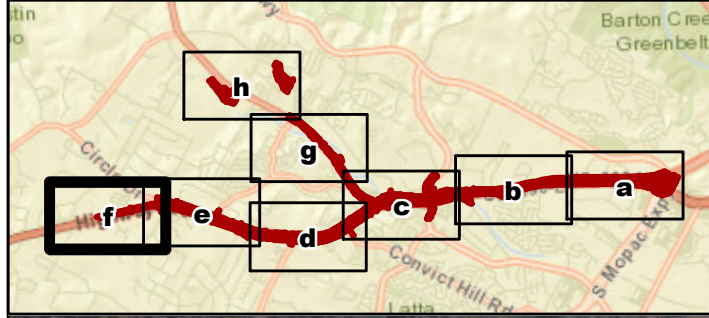
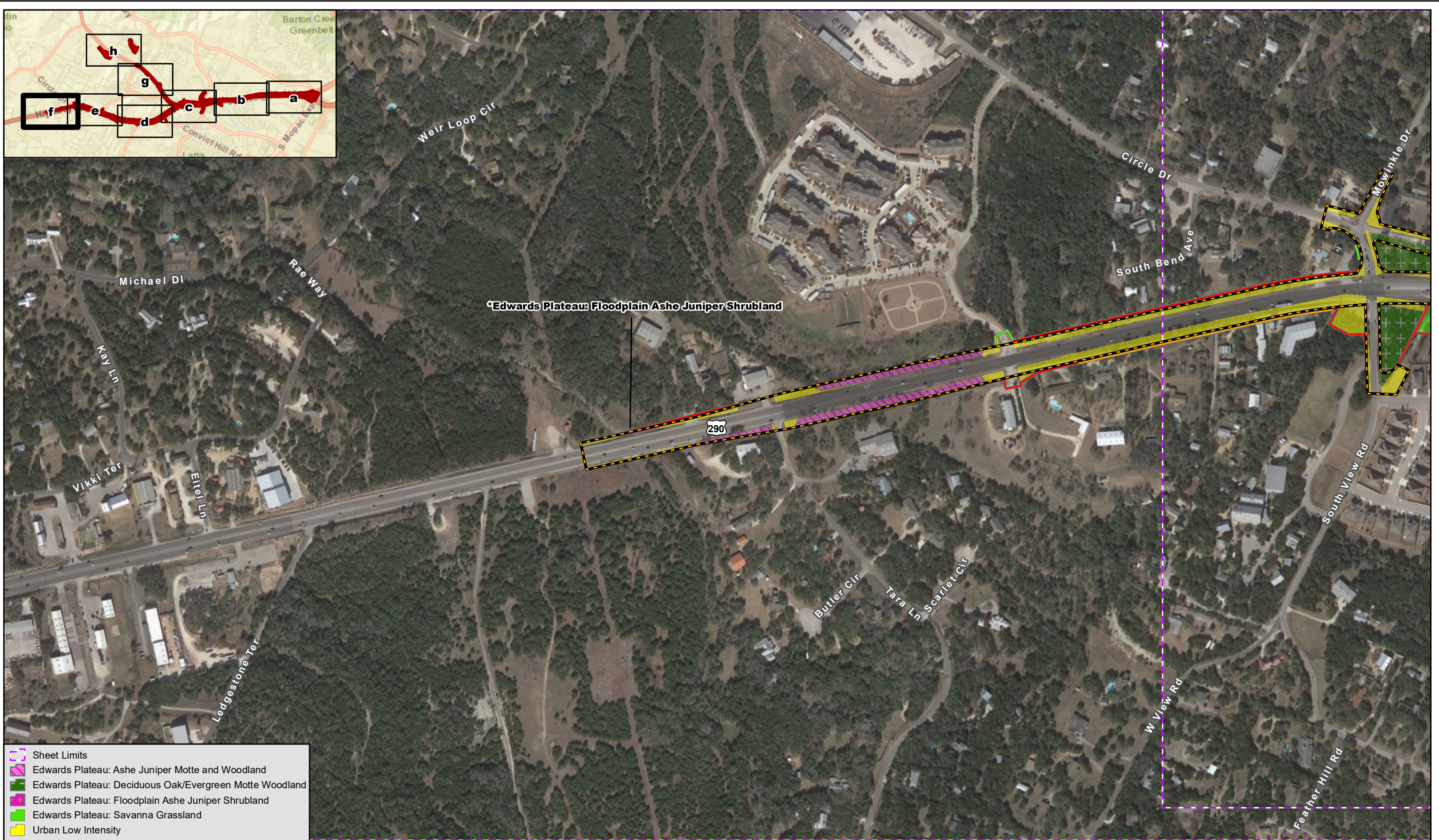


Figure 8f. Observed Vegetation Types
 Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

- Existing Right-of-Way
- Proposed Right-of-Way
- Temporary Construction Easement
- Proposed Driveway License

| | |
|----------------------------------|-----------------|
| | 0 to 400 Feet |
| | 0 to 120 Meters |
| Prepared for: TxDOT | 1 in = 400 feet |
| Data Source: CMEC (2016) | Scale: 1:4,800 |
| Aerial Source: Google (2018) | Date: 5/8/2019 |
| CSJ: 0013-08-060 and 0700-03-077 | |

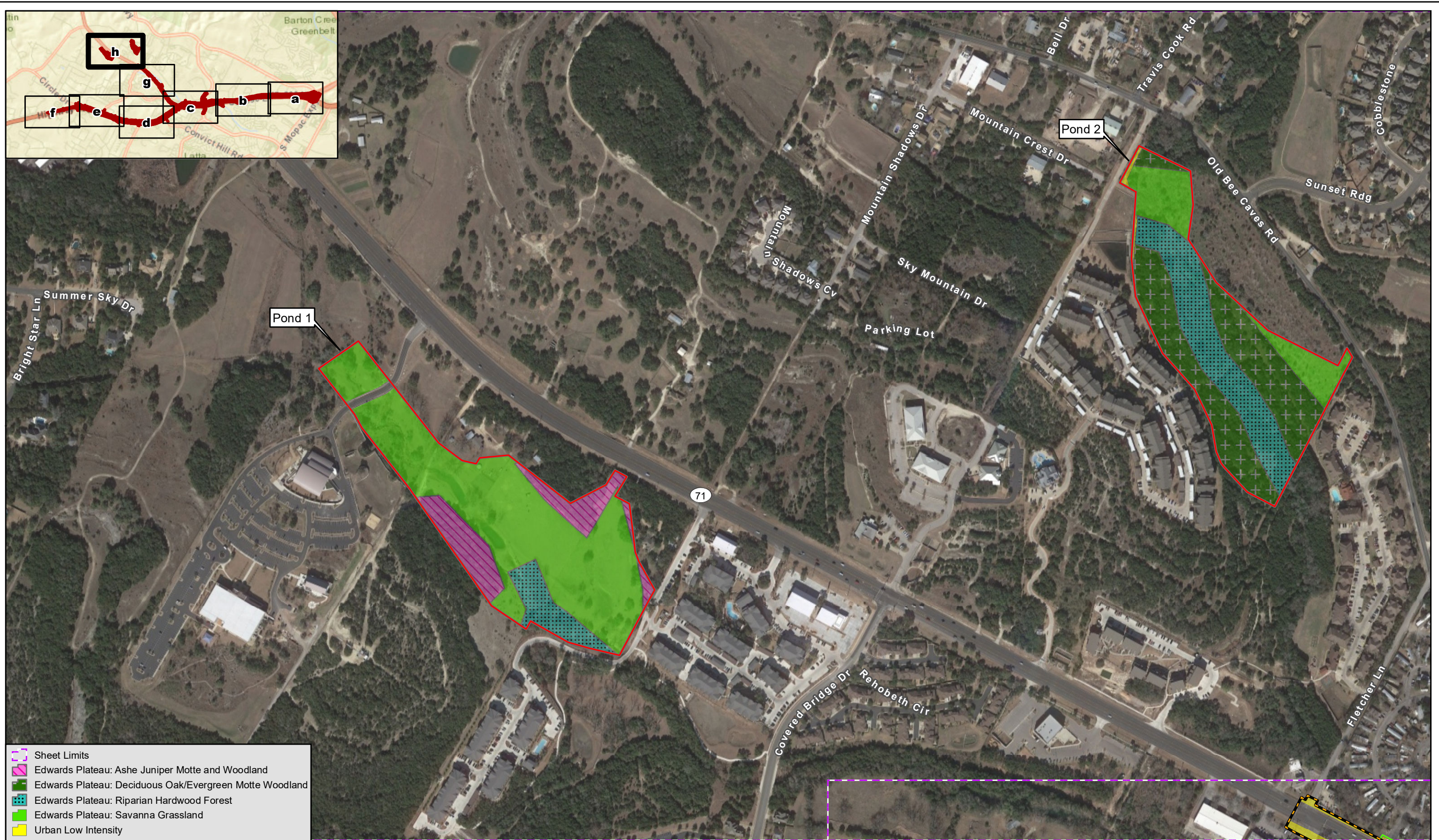


Figure 8h. Observed Vegetation Types

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

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- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Driveway License

| | | |
|--|---|-----------------|
| | | 1 in = 400 feet |
| | | Scale: 1:4,800 |
| Data Source: CMEC (2016) Aerial Source: Google (2018) | Prepared for: TxDOT CSJ: 0013-08-060 and 0700-03-077 | Date: 5/8/2019 |

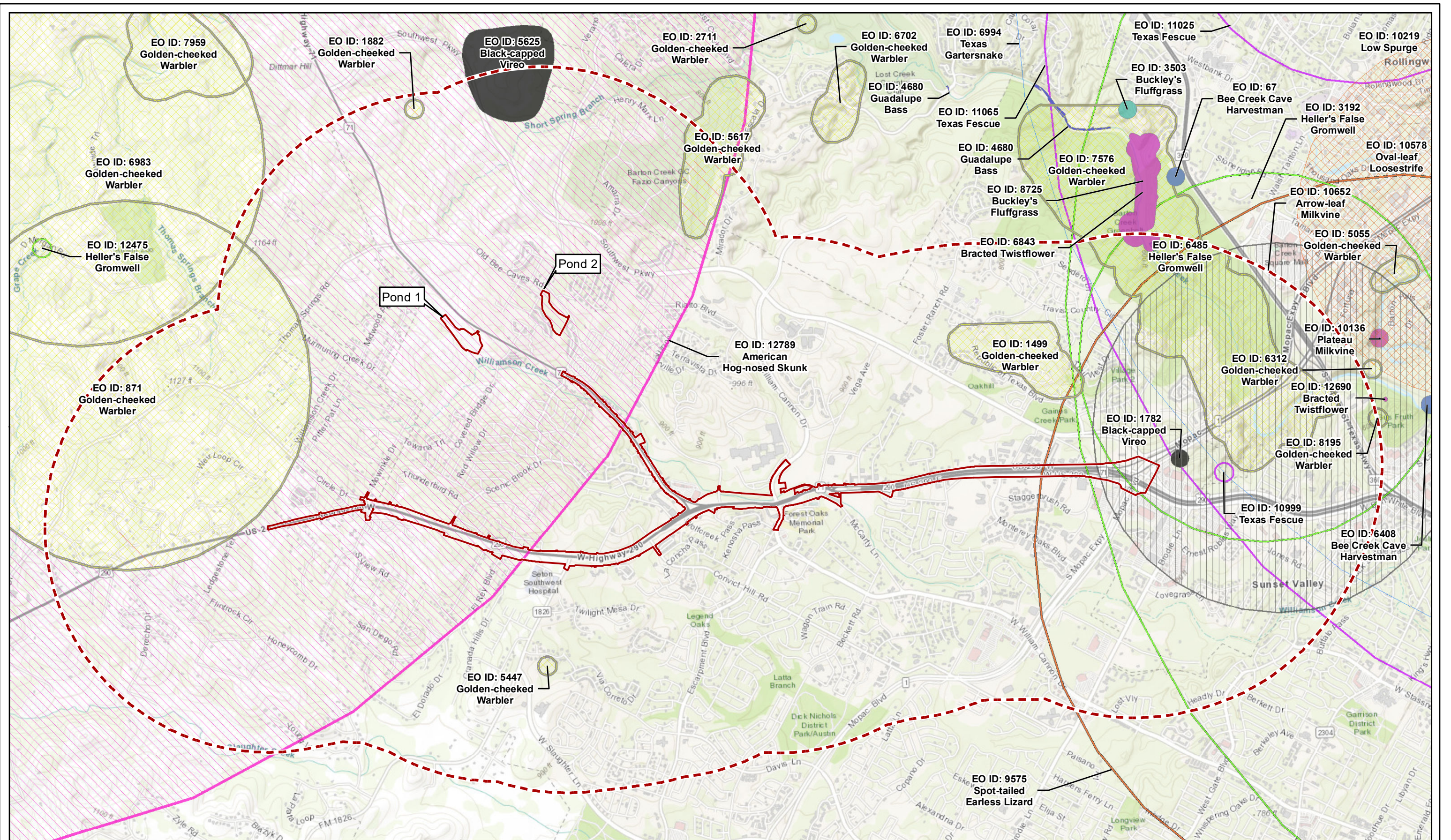


Figure 9. TXNDD Elements of Occurrence

Oak Hill Parkway: US 290W from Mopac/Loop 1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive

- | | | | | | |
|----------------------------------|---------------------------|------------------------|-------------------------|----------------------------|-------------------|
| Project Location | Arrow-leaf Milkvine | Bracted Twistflower | Guadalupe Bass | Plateau Milkvine | Texas Gartersnake |
| 1.5-mile Project Location Buffer | Bee Creek Cave Harvestman | Buckley's Fluffgrass | Heller's False Gromwell | Spot-tailed Earless Lizard | |
| American Hog-nosed Skunk | Black-capped Vireo | Golden-cheeked Warbler | Oval-leaf Loosestrife | Texas Fescue | |

Prepared for: TxDOT | 1 in = 3,200 feet
 Data Sources: TPWD (03/28/2019, 2014) | Scale: 1:38,400
 Basemap Source: ESRI (2019) | CSJ: 0013-08-060 and 0700-03-077 | Date: 5/8/2019

Attachment B: Project Area Photographs



Photograph 1: Commercial land use along SH 71 south of Williamson Creek crossing; facing south.



Photograph 2: Urban land use and commercial properties along US 290; facing east.



Photograph 3: Edwards Plateau: Savannah Grassland with juniper overstory along US 290 (foreground) and residential development in background; facing southeast.



Photograph 4: Project eastern terminus at Mopac; facing east.



Photograph 5: Oak-juniper woodland and native-invasive vegetation along US 290; facing west.



Photograph 6: Urban low intensity along US 290 adjacent to roadway and Edwards Plateau: Ashe Juniper Motte and Woodland outside the fenceline; facing east.



Photograph 7: Live Oak grove at Circle Drive and US 290; facing northeast



Photograph 8: Edwards Plateau: Deciduous Oak/Evergreen Motte and Woodland vegetation type along US 290; facing north.



Photograph 9: Riparian vegetation at SH 71 Williamson Creek crossing; facing southeast.



Photograph 10: Riparian vegetation along Williamson Creek at Joe Tanner; facing northwest towards US 290/SH71.



Photograph 11: Riparian vegetation along Williamson Creek at Old Bee Caves Road; facing east.



Photograph 12: Limestone outcrop along US 290; facing west.



Photograph 13: Urban Low Intensity vegetation and limestone cliff at the start of Recharge Zone along US290/SH71 at William Cannon; facing east.



Photograph 14: Native invasive vegetation and Urban Low Intensity along US290/SH71 at William Cannon; facing east.



Photograph 15: Native oak grove in front of Hampton Inn along US 290; facing north.



Photograph 16: Low water crossing of Williamson Creek at Joe Tanner Lane; facing southeast.



Photograph 17: Williamson Creek at SH 71 bridge; facing northeast.



Photograph 18: SH 71 detention pond, currently being used as a disk golf course; facing northeast.



Photograph 19: SH 71 detention pond, view downstream of unnamed tributary to Williamson Creek; facing southwest.



Photograph 20: SH 71 detention pond, view of Edwards Plateau Ashe Juniper, Motte and Woodland vegetation on the western edge; facing west.



Photograph 21: Stock pond located within SH 71 detention pond; facing north.



Photograph 22: Second stock pond located within SH 71 detention pond; facing southwest.



Photograph 23: Edwards Plateau: Savanna Grassland vegetation located within central portion of SH 71 detention pond site; facing south.



Photograph 24: Recently tilled plot of land near residential structure located in SH 71 detention pond site; facing west.



Photograph 25: Residential property adjacent to SH 71 detention pond; facing northwest.



Photograph 26: Unnamed tributary to Williamson Creek within SH 71 detention pond site; facing south.



Photograph 27: Unnamed tributary to Williamson Creek within SH 71 detention pond site; facing north.



Photograph 28: Actively grazed portion of the SH 71 detention pond; facing southwest.



Photograph 29: US 71 at Silvermine Drive; facing south.



Photograph 30: Edwards Plateau: Deciduous Oak/Evergreen Motte Woodland vegetation type within the Bee Cave detention pond; facing west.



Photograph 31: Dry creek bed within the Bee Cave detention pond site; facing northwest.



Photograph 32: Inactive passerine nest within the Bee Cave detention pond site; facing north.



Photograph 33: Edwards Plateau: Deciduous Oak/Evergreen Motte Woodland vegetation type within the Bee Cave detention pond; facing north.



Photograph 34: Edwards Plateau: Riparian Hardwood Forest vegetation type adjacent to dry creek bed in Bee Cave detention pond site; facing south.



Photograph 35: Utility infrastructure within the Bee Cave detention pond; facing west.



Photograph 36: Debris piles and structure located with the Bee Cave detention pond; facing southeast.

Attachment C: County Lists



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Austin Ecological Services Field Office

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<http://www.fws.gov/southwest/es/AustinTexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

In Reply Refer To:

April 03, 2019

Consultation Code: 02ETAU00-2016-SLI-0077

Event Code: 02ETAU00-2019-E-01763

Project Name: Oak Hill Parkway Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that *may* occur within the county of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please note that new information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Also note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of federally listed as threatened

or endangered species and to determine whether projects may affect these species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

While a Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment, the Federal Agency must notify the Service in writing of any such designation. The Federal agency shall also independently review and evaluate the scope and content of a biological assessment prepared by their designated non-Federal representative before that document is submitted to the Service.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by a federally funded, permitted or authorized activity, the agency is required to consult with the Service pursuant to 50 CFR 402. The following definitions are provided to assist you in reaching a determination:

- *No effect* - the proposed action will not affect federally listed species or critical habitat. A “no effect” determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, if the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.
 - *May affect, but is not likely to adversely affect* - the project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial. Certain avoidance and minimization measures may need to be implemented in order to reach this level of effect. The Federal agency or the designated non-Federal representative should consult with the Service to seek written concurrence that adverse effects are not likely. Be sure to include all of the information and documentation used to reach your decision with your request for concurrence. The Service must have this documentation before issuing a concurrence.
 - *Is likely to adversely affect* - adverse effects to listed species may occur as a direct or indirect result of the proposed action. For this determination, the effect of the action is neither discountable nor insignificant. If the overall effect of the proposed action is beneficial to the listed species but the action is also likely to cause some adverse effects to individuals of that species, then the proposed action “is likely to adversely affect” the listed species. The analysis should consider all interrelated and interdependent actions. An “is likely to adversely affect” determination requires the Federal action agency to initiate formal section 7 consultation with our office.
-

Regardless of the determination, the Service recommends that the Federal agency maintain a complete record of the evaluation, including steps leading to the determination of effect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>.

Migratory Birds

For projects that may affect migratory birds, the Migratory Bird Treaty Act (MBTA) implements various treaties and conventions for the protection of these species. Under the MBTA, taking, killing, or possessing migratory birds is unlawful. Migratory birds may nest in trees, brushy areas, or other areas of suitable habitat. The Service recommends activities requiring vegetation removal or disturbance avoid the peak nesting period of March through August to avoid destruction of individuals, nests, or eggs. If project activities must be conducted during this time, we recommend surveying for nests prior to conducting work. If a nest is found, and if possible, the Service recommends a buffer of vegetation remain around the nest until the young have fledged or the nest is abandoned.

For additional information concerning the MBTA and recommendations to reduce impacts to migratory birds please contact the U.S. Fish and Wildlife Service Migratory Birds Office, 500 Gold Ave. SW, Albuquerque, NM 87102. A list of migratory birds may be viewed at <https://www.fws.gov/birds/management/managed-species/migratory-bird-treaty-act-protected-species.php>. Guidance for minimizing impacts to migratory birds for projects including communications towers can be found at: <https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/communication-towers.php>. Additionally, wind energy projects should follow the wind energy guidelines

<https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/wind-energy.php>) for minimizing impacts to migratory birds and bats.

Finally, please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan <https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/eagles.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Austin Ecological Services Field Office

10711 Burnet Road, Suite 200

Austin, TX 78758-4460

(512) 490-0057

Project Summary

Consultation Code: 02ETAU00-2016-SLI-0077

Event Code: 02ETAU00-2019-E-01763

Project Name: Oak Hill Parkway Project

Project Type: TRANSPORTATION

Project Description: The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (CTRMA) are considering mobility improvements to U.S. Highway 290 (US 290)/ State Highway (SH) 71 West through Oak Hill (the Oak Hill Parkway). The project corridor extends along US 290 from State Loop 1 (Loop 1 or Mopac) to Ranch-to-Market (RM) 1826 for a distance of approximately 3.6 miles with a transition to the west. The project also includes the interchange on SH 71 from US 290 to Silvermine Dr

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/30.237750030012997N97.83825021783632W>



Counties: Travis, TX

Endangered Species Act Species

There is a total of 20 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 3 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.
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Birds

| NAME | STATUS |
|---|------------|
| <p>Golden-cheeked Warbler (=wood) <i>Dendroica chrysoparia</i></p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/33</p> | Endangered |
| <p>Least Tern <i>Sterna antillarum</i></p> <p>Population: interior pop. No critical habitat has been designated for this species. This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/8505</p> | Endangered |
| <p>Piping Plover <i>Charadrius melodus</i></p> <p>Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location is outside the critical habitat. This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/6039</p> | Threatened |
| <p>Red Knot <i>Calidris canutus rufa</i></p> <p>No critical habitat has been designated for this species. This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/1864</p> | Threatened |
| <p>Whooping Crane <i>Grus americana</i></p> <p>Population: Wherever found, except where listed as an experimental population There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/758</p> | Endangered |

Amphibians

| NAME | STATUS |
|--|------------|
| <p>Austin Blind Salamander <i>Eurycea waterlooensis</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5737</p> | Endangered |
| <p>Barton Springs Salamander <i>Eurycea sosorum</i></p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1113</p> | Endangered |
| <p>Jollyville Plateau Salamander <i>Eurycea tonkawae</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3116</p> | Threatened |

Clams

| NAME | STATUS |
|--|-----------|
| <p>Golden Orb <i>Quadrula aurea</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9042</p> | Candidate |
| <p>Smooth Pimpleback <i>Cyclonaias houstonensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8967</p> | Candidate |
| <p>Texas Fatmucket <i>Lampsilis bracteata</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9041</p> | Candidate |
| <p>Texas Fawnsfoot <i>Truncilla macrodon</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8965</p> | Candidate |
| <p>Texas Pimpleback <i>Quadrula petrina</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8966</p> | Candidate |

Insects

| NAME | STATUS |
|--|------------|
| <p>Kretschmarr Cave Mold Beetle <i>Texamaurops reddelli</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3140</p> | Endangered |
| <p>Tooth Cave Ground Beetle <i>Rhadine persephone</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5625</p> | Endangered |

Arachnids

| NAME | STATUS |
|--|------------|
| Bee Creek Cave Harvestman <i>Texella reddelli</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2464 | Endangered |
| Bone Cave Harvestman <i>Texella reyesi</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5306 | Endangered |
| Tooth Cave Pseudoscorpion <i>Tartarocreagris texana</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6667 | Endangered |
| Tooth Cave Spider <i>Neoleptoneta myopica</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2360 | Endangered |

Flowering Plants

| NAME | STATUS |
|---|-----------|
| Bracted Twistflower <i>Streptanthus bracteatus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2856 | Candidate |

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

TRAVIS COUNTY

AMPHIBIANS

| | | Federal Status | State Status |
|---|------------------------------|----------------|--------------|
| Austin blind salamander | <i>Eurycea waterlooensis</i> | LE | E |
| This species is mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton Springs (Sunken Gardens (Old Mill) Spring, Eliza Spring, and Parthenia (Main) Spring which forms Barton Springs Pool); feeds on amphipods, ostracods, copepods, plant material, and (in captivity) a wide variety of small aquatic invertebrates | | | |
| Barton Springs salamander | <i>Eurycea sosorum</i> | LE | E |
| dependent upon water flow/quality from the Barton Springs pool of the Edwards Aquifer; known from the outlets of Barton Springs and subterranean water-filled caverns; found under rocks, in gravel, or among aquatic vascular plants and algae, as available; feeds primarily on amphipods | | | |
| Jollyville Plateau salamander | <i>Eurycea tonkawae</i> | LT | |
| known from springs and waters of some caves north of the Colorado River | | | |
| Pedernales River springs salamander | <i>Eurycea sp 6</i> | | |
| endemic; known only from springs | | | |

ARACHNIDS

| | | Federal Status | State Status |
|--|-------------------------------|----------------|--------------|
| Bandit Cave spider | <i>Cicurina bandida</i> | | |
| very small, subterrestrial, subterranean obligate | | | |
| Bee Creek Cave harvestman | <i>Texella reddelli</i> | LE | |
| small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson counties | | | |
| Bone Cave harvestman | <i>Texella reyesi</i> | LE | |
| small, blind, cave-adapted harvestman endemic to several caves in Travis and Williamson counties; weakly differentiated from <i>Texella reddelli</i> | | | |
| Tooth Cave pseudoscorpion | <i>Tartarocreagris texana</i> | LE | |
| small, cave-adapted pseudoscorpion known from small limestone caves of the Edwards Plateau | | | |
| Tooth Cave spider | <i>Neoleptoneta myopica</i> | LE | |
| very small, cave-adapted, sedentary spider | | | |
| Warton's cave meshweaver | <i>Cicurina wartoni</i> | | |
| very small, cave-adapted spider | | | |

TRAVIS COUNTY

BIRDS

| | | Federal Status | State Status |
|--|---------------------------------------|----------------|--------------|
| American Peregrine Falcon | <i>Falco peregrinus anatum</i> | DL | T |
| <p>year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p> | | | |
| Arctic Peregrine Falcon | <i>Falco peregrinus tundrius</i> | DL | |
| <p>migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.</p> | | | |
| Bald Eagle | <i>Haliaeetus leucocephalus</i> | DL | T |
| <p>found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds</p> | | | |
| Black-capped Vireo | <i>Vireo atricapilla</i> | DL | E |
| <p>oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer</p> | | | |
| Golden-cheeked Warbler | <i>Setophaga chrysoparia</i> | LE | E |
| <p>juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer</p> | | | |
| Interior Least Tern | <i>Sternula antillarum athalassos</i> | LE | E |
| <p>The subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony</p> | | | |
| Mountain Plover | <i>Charadrius montanus</i> | | |
| <p>breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous</p> | | | |
| Peregrine Falcon | <i>Falco peregrinus</i> | DL | T |
| <p>both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.</p> | | | |
| Red Knot | <i>Calidris canutus rufa</i> | LT | |

TRAVIS COUNTY

FISHES

| | Federal Status | State Status |
|--|----------------|--------------|
| Smalleye shiner <i>Notropis buccula</i> endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates | LE | |

INSECTS

| | Federal Status | State Status |
|---|----------------|--------------|
| Kretschmarr Cave mold beetle <i>Texamaurops reddelli</i> small, cave-adapted beetle found under rocks buried in silt; small, Edwards Limestone caves in of the Jollyville Plateau, a division of the Edwards Plateau | LE | |
| Tooth Cave blind rove beetle <i>Cylindropsis sp 1</i> one specimen collected from Tooth Cave; only known North American collection of this genus | | |
| Tooth Cave ground beetle <i>Rhadine persephone</i> resident, small, cave-adapted beetle found in small Edwards Limestone caves in Travis and Williamson counties | LE | |

MAMMALS

| | Federal Status | State Status |
|--|----------------|--------------|
| Cave myotis <i>Myotis velifer</i> colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (<i>Hirundo pyrrhonota</i>) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore | | |
| Plains spotted skunk <i>Spilogale putorius interrupta</i> catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie | | |
| Red wolf <i>Canis rufus</i> extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies | LE | E |

MOLLUSKS

| | Federal Status | State Status |
|---|----------------|--------------|
| False spike mussel <i>Fusconaia mitchelli</i> possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at the site; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins | | T |

TRAVIS COUNTY

MOLLUSKS

| | | Federal Status | State Status |
|---|------------------------------|----------------|--------------|
| Smooth pimpleback | <i>Quadrula houstonensis</i> | C | T |
| <p>small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel, tolerates very slow to moderate flow rates, appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms, lower Trinity (questionable), Brazos, and Colorado River basins</p> | | | |
| Texas fatmucket | <i>Lampsilis bracteata</i> | C | T |
| <p>streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and course gravel or sand in moderately flowing water; Colorado and Guadalupe River basins</p> | | | |
| Texas pimpleback | <i>Quadrula petrina</i> | C | T |
| <p>mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins</p> | | | |

REPTILES

| | | Federal Status | State Status |
|--|--------------------------------------|----------------|--------------|
| Spot-tailed earless lizard | <i>Holbrookia lacerata</i> | | |
| <p>central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground</p> | | | |
| Texas garter snake | <i>Thamnophis sirtalis annectens</i> | | |
| <p>wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August</p> | | | |
| Texas horned lizard | <i>Phrynosoma cornutum</i> | | T |
| <p>open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September</p> | | | |

PLANTS

| | | Federal Status | State Status |
|--|------------------------------|----------------|--------------|
| Arrowleaf milkvine | <i>Matelea sagittifolia</i> | | |
| <p>GLOBAL RANK: G3 ; Most consistently encountered in thornscrub in South Texas; Perennial; Flowering March-July; Fruiting April-July & Dec?</p> | | | |
| Basin bellflower | <i>Campanula reverchonii</i> | | |
| <p>Texas endemic; among scattered vegetation on loose gravel, gravelly sand, and rock outcrops on open slopes with exposures of igneous and metamorphic rocks; may also occur on sandbars and other alluvial deposits along major rivers; flowering May-July</p> | | | |
| Boerne bean | <i>Phaseolus texensis</i> | | |
| <p>Narrowly endemic to rocky canyons in eastern and southern Edwards Plateau occurring on limestone soils in mixed woodlands, on limestone cliffs and outcrops, frequently along creeks.</p> | | | |

TRAVIS COUNTY

PLANTS

Federal Status

State Status

Bracted twistflower

Streptanthus bracteatus

C

Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations; populations fluctuate widely from year to year, depending on winter rainfall; flowering mid April-late May, fruit matures and foliage withers by early summer

Buckley tridens

Tridens buckleyanus

GLOBAL RANK: G3 ; Occurs in juniper-oak woodlands on rocky limestone slopes; Perennial; Flowering/Fruiting April-Nov

Correll's false dragon-head

Physostegia correllii

wet, silty clay loams on streamsides, in creek beds, irrigation channels and roadside drainage ditches; or seepy, mucky, sometimes gravelly soils along riverbanks or small islands in the Rio Grande; or underlain by Austin Chalk limestone along gently flowing spring-fed creek in central Texas; flowering May-September

Glass Mountains coral-root

Hexalectris nitida

GLOBAL RANK: G3; Apparently rare in mixed woodlands in canyons in the mountains of the Brewster County, but encountered with regularity, albeit in small numbers, under *Juniperus ashei* in woodlands over limestone on the Edwards Plateau, Callahan Divide and Lampasas Cutplain; Perennial; Flowering June-Sept; Fruiting July-Sept

Gravelbar brickellbush

Brickellia dentata

GLOBAL RANK: G3; Essentially restricted to frequently-scoured gravelly alluvial beds in creek and river bottoms; Perennial; Flowering June-Nov; Fruiting June-Oct

Heller's marbleseed

Onosmodium helleri

GLOBAL RANK: G3; Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone slopes, often in more mesic portions of canyons; Perennial; Flowering March-May

Low spurge

Euphorbia peplidion

GLOBAL RANK: G3; Occurs in a variety of vernal-moist situations in a number of natural regions; Annual; Flowering Feb-April; Fruiting March-April

Narrowleaf brickellbush

Brickellia eupatorioides var. *gracillima*

GLOBAL RANK: G5T3; Moist to dry gravelly alluvial soils along riverbanks but also on limestone slopes; Perennial; Flowering/Fruiting April-Nov

Net-leaf bundleflower

Desmanthus reticulatus

GLOBAL RANK: G3; Mostly on clay prairies of the coastal plain of central and south Texas; Perennial; Flowering April-July; Fruiting April-Oct

Plateau loosestrife

Lythrum ovalifolium

GLOBAL RANK: G4; Banks and gravelly beds of perennial (or strong intermittent) streams on the Edwards Plateau, Llano Uplift and Lampasas Cutplain; Perennial; Flowering/Fruiting April-Nov

TRAVIS COUNTY

PLANTS

Federal Status

State Status

Plateau milkvine

Matelea edwardsensis

GLOBAL RANK: G3 ; Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; Flowering March-Oct; Fruiting May-June

Rock grape

Vitis rupestris

GLOBAL RANK: G3; Occurs on rocky limestone slopes and in streambeds; Perennial; Flowering March-May; Fruiting May-July

Scarlet leather-flower

Clematis texensis

GLOBAL RANK: G3; Usually in oak-juniper woodlands in mesic rocky limestone canyons or along perennial streams; Perennial; Flowering March-July; Fruiting May-July

Stanfield's beebalm

Monarda stanfieldii

GLOBAL RANK: G5T3 ; Largely confined to granite sands along the middle course of the Colorado River and its tributaries; Perennial

Sycamore-leaf snowbell

Styrax platanifolius ssp. platanifolius

GLOBAL RANK: G3T3; Rare throughout range, usually in oak-juniper woodlands on steep rocky banks and ledges along intermittent or perennial streams, rarely far from some reliable source of moisture; Perennial; Flowering April-May; Fruiting May-Aug

Texas croton

Croton alabamensis var texensis

Texas endemic; in duff-covered loamy clay soils on rocky slopes in forested, mesic limestone canyons; locally abundant on deeper soils on small terraces in canyon bottoms, often forming large colonies and dominating the shrub layer; scattered individuals are occasionally on sunny margins of such forests; also found in contrasting habitat of deep, friable soils of limestone uplands, mostly in the shade of evergreen woodland mottes; flowering late February-March; fruit maturing and dehiscing by early June

Texas almond

Prunus minutiflora

GLOBAL RANK: G3; Wide-ranging but scarce, in a variety of grassland and shrubland situations, mostly on calcareous soils underlain by limestone but occasionally in sandier neutral soils underlain by granite; Perennial; Flowering Feb-May & Oct; Fruiting Feb-Sept

Texas amorpha

Amorpha roemeriana

GLOBAL RANK: G3; Juniper-oak woodlands or shrublands on rocky limestone slopes, sometimes on dry shelves above creeks; Perennial; Flowering May-June; Fruiting June-Oct

Texas barberry

Berberis swaseyi

GLOBAL RANK: G3; Shallow calcareous stony clay of upland grasslands/shrublands over limestone as well as in loamier soils in openly wooded canyons and on creek terraces; Perennial; Flowering/Fruiting March-June

Texas fescue

Festuca versuta

GLOBAL RANK: G3; Occurs in mesic woodlands on limestone-derived soils on stream terraces and canyon slopes; Perennial; Flowering/Fruiting April-June

TRAVIS COUNTY

PLANTS

Federal Status

State Status

Texas milk vetch

Astragalus reflexus

GLOBAL RANK: G3; Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

Texas seymeria

Seymeria texana

GLOBAL RANK: G3; Found primarily in grassy openings in juniper-oak woodlands on dry rocky slopes but sometimes on rock outcrops in shaded canyons; Annual; Flowering May-Nov; Fruiting July-Nov

Tree dodder

Cuscuta exaltata

GLOBAL RANK: G3; Parasitic on various *Quercus*, *Juglans*, *Rhus*, *Vitis*, *Ulmus*, and *Diospyros* species as well as *Acacia berlandieri* and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct

Warnock's coral-root

Hexalectris warnockii

in leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; in the Trans Pecos in oak-pinyon-juniper woodlands in higher mesic canyons (to 2000 m [6550 ft]), primarily on igneous substrates; in Terrell County under *Quercus fusiformis* mottes on terraces of spring-fed perennial streams, draining an otherwise rather xeric limestone landscape; on the Callahan Divide (Taylor County), the White Rock Escarpment (Dallas County), and the Edwards Plateau in oak-juniper woodlands on limestone slopes; in Gillespie County on igneous substrates of the Llano Uplift; flowering June-September; individual plants do not usually bloom in successive years

Last Update: 4/18/2019

TRAVIS COUNTY

AMPHIBIANS

Austin blind salamander

Eurycea waterlooensis

Mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton Springs (Sunken Gardens (Old Mill) Spring, Eliza Spring, and Parthenia (Main) Spring which forms Barton Springs Pool); feeds on amphipods, ostracods, copepods, plant material, and (in captivity) a wide variety of small aquatic invertebrates

Federal Status: LE

State Status: E

SGCN: Y

Endemic: Y

Global Rank: G1

State Rank: S1

Barton Springs salamander

Eurycea sosorum

Dependent upon water flow/quality from the Barton Springs pool of the Edwards Aquifer; known from the outlets of Barton Springs and subterranean water-filled caverns; found under rocks, in gravel, or among aquatic vascular plants and algae, as available; feeds primarily on amphipods

Federal Status: LE

State Status: E

SGCN: Y

Endemic: Y

Global Rank: G1

State Rank: S1

Houston toad

Anaxyrus houstonensis

Primary habitat is sandy soil which supports populations of *Pinus taeda*, water in pools, ephemeral pools, stock tanks; breeds in spring especially after rains; burrows in soil of adjacent uplands when inactive; breeds February-June; associated with soils of the Sparta, Carrizo, Goliad, Queen City, Recklaw, Weches, and Willis geologic formations.

Federal Status: LE

State Status: E

SGCN: Y

Endemic: Y

Global Rank: G1

State Rank: S1

Jollyville Plateau salamander

Eurycea tonkawae

Known from springs and waters of some caves north of the Colorado River

Federal Status: LT

State Status:

SGCN: Y

Endemic: Y

Global Rank: G1

State Rank: S2

Pedernales River Springs salamander

Eurycea sp. 6

Known only from springs

Federal Status:

State Status:

SGCN: N

Endemic: Y

Global Rank: G1

State Rank: S1S2

Strecker's chorus frog

Pseudacris streckeri

Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G5

State Rank: S3

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TRAVIS COUNTY

AMPHIBIANS

Texas salamander *Eurycea neotenes*
Troglotic; springs, seeps, cave streams, and creek headwaters; often hides under rocks and leaves in water; restricted to Helotes and Leon Creek drainages
Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G1 State Rank: S1S2

Woodhouse's toad *Anaxyrus woodhousii*
Extremely catholic up to 5000 feet, does very well (except for traffic) in association with man.
Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: SU

ARACHNIDS

Bandit Cave spider *Cicurina bandida*
Very small, subterranean, subterranean obligate
Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G2Q State Rank: S1

Bone Cave harvestman *Texella reyesi*
Small, blind, cave-adapted harvestman endemic to several caves in Travis and Williamson counties; weakly differentiated from *Texella reddelli*
Federal Status: LE State Status: SGCN: Y
Endemic: Y Global Rank: G2G3 State Rank: S2

No accepted common name *Eidmannella reclusa*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G1G2 State Rank: S1

No accepted common name *Tartarocreagris altimana*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G1G2 State Rank: S1

No accepted common name *Texella spinoperca*
Habitat description is not available at this time.
Federal Status: State Status: SGCN: Y
Endemic: Global Rank: GNR State Rank: SNR

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TRAVIS COUNTY

ARACHNIDS

No accepted common name *Tartarocreagris attenuata*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2 | State Rank: S1 |

No accepted common name *Tartarocreagris domina*

Habitat description is not available at this time.

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|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2 | State Rank: S1 |

No accepted common name *Tartarocreagris proserpina*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2 | State Rank: S1 |

No accepted common name *Cicurina trivisae*

Habitat description is not available at this time.

| | | |
|-----------------|--------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2G | State Rank: S1 |

No accepted common name *Texella mulaiki*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G2G3 | State Rank: S2 |

No accepted common name *Tartarocreagris infernalis*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|-----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G2G3 | State Rank: S2? |

No accepted common name *Tartarocreagris intermedia*

Habitat description is not available at this time.

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|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2 | State Rank: S1 |

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TRAVIS COUNTY

ARACHNIDS

No accepted common name *Texella grubbsi*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G1G2 State Rank: S1

Reddell harvestman *Texella reddelli*

Small, blind, cave-adapted harvestman endemic to a few caves in Travis and Williamson counties

Federal Status: LE State Status: SGCN: Y
Endemic: Y Global Rank: G2G3 State Rank: S2

Tooth Cave pseudoscorpion *Tartarocreagris texana*

Small, cave-adapted pseudoscorpion known from small limestone caves of the Edwards Plateau

Federal Status: LE State Status: SGCN: Y
Endemic: Y Global Rank: G1G2 State Rank: S1

Tooth Cave spider *Neoleptoneta myopica*

Very small, cave-adapted, sedentary spider

Federal Status: LE State Status: SGCN: Y
Endemic: Global Rank: G1G2 State Rank: S1

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3B,S3N

black rail *Laterallus jamaicensis*

Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: PT State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S2

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TRAVIS COUNTY

BIRDS

black-capped vireo

Vireo atricapilla

Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer

| | | |
|-----------------|-----------------|-----------------|
| Federal Status: | State Status: E | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S2B |

Franklin's gull

Leucophaeus pipixcan

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|-----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G4G5 | State Rank: S2N |

golden-cheeked warbler

Setophaga chrysoparia

Ashe juniper in mixed stands with various oaks (*Quercus* spp.). Edges of cedar brakes. Dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer.

| | | |
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| Federal Status: LE | State Status: E | SGCN: Y |
| Endemic: N | Global Rank: G2 | State Rank: S2B |

interior least tern

Sternula antillarum athalassos

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

| | | |
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| Federal Status: LE | State Status: E | SGCN: Y |
| Endemic: N | Global Rank: G4T2Q | State Rank: S1B |

mountain plover

Charadrius montanus

Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

| | | |
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| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S2 |

piping plover

Charadrius melodus

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TRAVIS COUNTY

BIRDS

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

| | | |
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| Federal Status: LT | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S2N |

swallow-tailed kite *Elanoides forficatus*

Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees

| | | |
|-----------------|-----------------|-----------------|
| Federal Status: | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S2B |

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G4T4 | State Rank: S2 |

white-faced ibis *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

| | | |
|-----------------|-----------------|-----------------|
| Federal Status: | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S4B |

whooping crane *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

| | | |
|--------------------|-----------------|-----------------|
| Federal Status: LE | State Status: E | SGCN: Y |
| Endemic: N | Global Rank: G1 | State Rank: S1N |

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TRAVIS COUNTY

BIRDS

wood stork *Mycteria americana*

Prefers to nest in large tracts of baldcypress (*Taxodium distichum*) or red mangrove (*Rhizophora mangle*); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

| | | |
|-----------------|-----------------|---------------------|
| Federal Status: | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G4 | State Rank: SHB,S2N |

zone-tailed hawk *Buteo albonotatus*

Arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions

| | | |
|-----------------|-----------------|-----------------|
| Federal Status: | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G4 | State Rank: S3B |

CRUSTACEANS

Balcones Cave amphipod *Stygobromus balconis*

Subaquatic, subterranean obligate amphipod

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G2G3 | State Rank: S2 |

Ezell's Cave amphipod *Stygobromus flagellatus*

Known only from artesian wells

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G2G3 | State Rank: S3 |

No accepted common name *Lirceolus bisetus*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2 | State Rank: S1 |

FISH

alligator gar *Atractosteus spatula*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3G4 | State Rank: S4 |

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TRAVIS COUNTY

FISH

american eel

Anguilla rostrata

Coastal waterways below reservoirs to gulf; spawns January to February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; most aquatic habitats with access to ocean, muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries; diet varies widely, geographically, and seasonally

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S4

blue sucker

Cycleptus elongatus

Usually inhabits channels and flowing pools with a moderate current, with bottoms of exposed bedrock sometimes in combination with hard clay, sand, and gravel; generally intolerant of highly turbid conditions. Larger portions of major rivers in Texas; adults winter in deep pools and move upstream in spring to spawn on riffles

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S3

chub shiner

Notropis potteri

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S4

Guadalupe bass

Micropterus treculii

Endemic to perennial streams of the Edwards Plateau region; introduced in Nueces River system

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G3 State Rank: S3

Guadalupe darter

Percina apristis

Most common over gravel or gravel and sand raceways of large streams and rivers.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G4 State Rank: SNR

headwater catfish

Ictalurus lupus

Originally throughout streams of the Edwards Plateau and the Rio Grande basin, currently limited to Rio Grande drainage, including Pecos River basin; springs, and sandy and rocky riffles, runs, and pools of clear creeks and small rivers

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3 State Rank: S2

ironcolor shiner

Notropis chalybaeus

Big Cypress Bayou and Sabine River basins; spawns April-September, eggs sink to bottom of pool; pools and slow runs of low gradient small acidic streams with sandy substrate and clear well vegetated water; feeds mainly on small insects, ingested plant material not digested

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G4 State Rank: S3

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TRAVIS COUNTY

FISH

sharpnose shiner

Notropis oxyrhynchus

Endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud

| | | |
|--------------------|-----------------|----------------|
| Federal Status: LE | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

silverband shiner

Notropis shumardi

Habitat description is not available at this time.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S4 |

smalleye shiner

Notropis buccula

Endemic to upper Brazos River system and its tributaries (Clear Fork and Bosque); apparently introduced into adjacent Colorado River drainage; medium to large prairie streams with sandy substrate and turbid to clear warm water; presumably eats small aquatic invertebrates

| | | |
|--------------------|-----------------|----------------|
| Federal Status: LE | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G2 | State Rank: S2 |

speckled chub

Macrhybopsis aestivalis

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|------------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3G4 | State Rank: S3S4 |

Texas shiner

Notropis amabilis

Habitat description is not available at this time.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G4 | State Rank: S4 |

western creek chubsucker

Erimyzon claviformis

Habitat includes silt-, sand-, and gravel-bottomed pools of clear headwaters, creeks, and small rivers; often near vegetation; occasionally in lakes (Page and Burr 2011). Spawning occurs in river mouths or pools, riffles, lake outlets, or upstream creeks (Becker 1983, Goodyear et al. 1982). Prefers headwaters, but seldom occurs in springs.

| | | |
|-----------------|-----------------|------------------|
| Federal Status: | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S2S3 |

INSECTS

a cave obligate beetle

Rhadine austinica

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|------------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1G2 | State Rank: S1S2 |

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TRAVIS COUNTY

INSECTS

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: G3G4 State Rank: SNR

Comanche harvester ant *Pogonomyrmex comanche*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G2G3 State Rank: S2

Kretschmarr Cave mold beetle *Texamaurops reddelli*

Small, cave-adapted beetle found under rocks buried in silt; small, Edwards Limestone caves in of the Jollyville Plateau, a division of the Edwards Plateau

Federal Status: LE State Status: SGCN: Y
Endemic: Y Global Rank: G1G2 State Rank: S1

No accepted common name *Andrena scotoptera*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: GNR State Rank: SNR

No accepted common name *Bombus variabilis*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: GU State Rank: SNR

No accepted common name *Lymantes nadineae*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: GNR State Rank: SNR

No accepted common name *Macrotera parkeri*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: GNR State Rank: SNR

No accepted common name *Neotrichia juani*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y

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TRAVIS COUNTY

INSECTS

Endemic: Global Rank: G1 State Rank: S1

No accepted common name *Xiphocentron messapus*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y

Endemic: Y Global Rank: G1G3 State Rank: S2?

No accepted common name *Rhadine subterranea*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y

Endemic: Y Global Rank: G2 State Rank: S2

No accepted common name *Oncopodura fenestra*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y

Endemic: Y Global Rank: G2G3 State Rank: S2?

Tooth Cave ground beetle *Rhadine persephone*

Resident, small, cave-adapted beetle found in small Edwards Limestone caves in Travis and Williamson counties

Federal Status: LE State Status: SGCN: Y

Endemic: Y Global Rank: G1G2 State Rank: S1

MAMMALS

American badger *Taxidea taxus*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y

Endemic: N Global Rank: G5 State Rank: S5

Aransas short-tailed shrew *Blarina hylophaga plumbea*

Excavates burrows in sandy soils underlying mottes of live oak trees or in areas with little to no ground cover; 2-3 litters of 4-6 young per year

Federal Status: State Status: SGCN: Y

Endemic: Y Global Rank: G5T1Q State Rank: S1

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status: State Status: SGCN: Y

Endemic: N Global Rank: G5 State Rank: S5

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TRAVIS COUNTY

MAMMALS

big free-tailed bat

Nyctinomops macrotis

Habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: | Global Rank: G5 | State Rank: S3 |

cave myotis bat

Myotis velifer

Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (*Hirundo pyrrhonota*) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G4G5 | State Rank: S4 |

eastern red bat

Lasiurus borealis

Found in a variety of habitats in Texas. Usually associated with wooded areas. Found in towns especially during migration.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3G4 | State Rank: S4 |

hoary bat

Lasiurus cinereus

Known from montane and riparian woodland in Trans-Pecos, forests and woods in east and central Texas.

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3G4 | State Rank: S4 |

long-tailed weasel

Mustela frenata

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S5 |

Mexican free-tailed bat

Tadarida brasiliensis

Roosts in buildings in east Texas. Largest maternity roosts are in limestone caves on the Edwards Plateau. Found in all habitats, forest to desert.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S5 |

Mexican long-tongued bat

Choeronycteris mexicana

Only Texas record is from riparian forest; in general--neotropical nectivorous species roosting in caves, mines, and large crevices found in deep canyons along the Rio Grande ; also found in buildings and often associated with big-eared bats (*Plecotus* spp.); single TX record from Santa Ana NWR

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3G4 | State Rank: S1 |

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TRAVIS COUNTY

MAMMALS

| | | | |
|--|--------------------------------------|-------------|------|
| mink | <i>Neovison vison</i> | | |
| Intimately associated with water; coastal swamps & marshes, wooded riparian zones, edges of lakes. Prefer floodplains. | | | |
| Federal Status: | State Status: | SGCN: | Y |
| Endemic: N | Global Rank: G5 | State Rank: | S4 |
| mountain lion | <i>Puma concolor</i> | | |
| Rugged mountains & riparian zones. | | | |
| Federal Status: | State Status: | SGCN: | Y |
| Endemic: N | Global Rank: G5 | State Rank: | S2S3 |
| plains spotted skunk | <i>Spilogale putorius interrupta</i> | | |
| Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie | | | |
| Federal Status: | State Status: | SGCN: | N |
| Endemic: N | Global Rank: G4T4 | State Rank: | S1S3 |
| southern short-tailed shrew | <i>Blarina carolinensis</i> | | |
| Habitat description is not available at this time. | | | |
| Federal Status: | State Status: | SGCN: | Y |
| Endemic: N | Global Rank: G5 | State Rank: | S4 |
| swamp rabbit | <i>Sylvilagus aquaticus</i> | | |
| Habitat description is not available at this time. | | | |
| Federal Status: | State Status: | SGCN: | Y |
| Endemic: N | Global Rank: G5 | State Rank: | S5 |
| tricolored bat | <i>Perimyotis subflavus</i> | | |
| Forest, woodland and riparian areas are important. Caves are very important to this species. | | | |
| Federal Status: | State Status: | SGCN: | Y |
| Endemic: N | Global Rank: G2G3 | State Rank: | S3S4 |
| western hog-nosed skunk | <i>Conepatus leuconotus</i> | | |
| Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes | | | |
| Federal Status: | State Status: | SGCN: | Y |
| Endemic: N | Global Rank: G4 | State Rank: | S4 |

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TRAVIS COUNTY

MAMMALS

woodland vole *Microtus pinetorum*

Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

MOLLUSKS

false spike mussel *Fusconaia mitchelli*

Possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at the site; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G1 State Rank: S1

No accepted common name *Patera leatherwoodi*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: G1 State Rank: S1

No accepted common name *Millerelix gracilis*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Global Rank: G2G3 State Rank: S2?

No accepted common name *Stygopyrgus bartonensis*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G1 State Rank: S1

No accepted common name *Phreatodrobia punctata*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G2 State Rank: S1

smooth pimpleback *Quadrula houstonensis*

Small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel, tolerates very slow to moderate flow rates, appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms, lower Trinity (questionable), Brazos, and Colorado River basins

Federal Status: C State Status: T SGCN: Y
Endemic: Y Global Rank: G2 State Rank: S1S2

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TRAVIS COUNTY

MOLLUSKS

Texas fatmucket *Lampsilis bracteata*

Streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and coarse gravel or sand in moderately flowing water; Colorado and Guadalupe River basins

Federal Status: C State Status: T SGCN: Y
Endemic: Y Global Rank: G1 State Rank: S1

Texas pimpleback *Cyclonaias petrina*

Mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado River basin.

Federal Status: C State Status: T SGCN: Y
Endemic: Y Global Rank: G2 State Rank: S1

REPTILES

American alligator *Alligator mississippiensis*

Coastal marshes; inland natural rivers, swamps and marshes; manmade impoundments.

Federal Status: State Status: SGCN: N
Endemic: N Global Rank: G5 State Rank: S4

common garter snake *Thamnophis sirtalis*

Irrigation canals and riparian-corridor farmlands in west; marshy, flooded pastureland, grassy or brushy borders of permanent bodies of water; coastal salt marshes.

Federal Status: State Status: SGCN: N
Endemic: Global Rank: G5 State Rank: S2

eastern box turtle *Terrapene carolina*

Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures. In Maryland bottomland forest, some hibernated in pits or depressions in forest floor (usually about 30 cm deep) usually within summer range; individuals tended to hibernate in same area in different years (Stickel 1989). Also attracted to farms, old fields and cut-over woodlands, as well as creek bottoms and dense woodlands. Egg laying sites often are sandy or loamy soils in open areas; females may move from bottomlands to warmer and drier sites to nest. In Maryland, females used the same nesting area in different years (Stickel 1989).

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

northern spot-tailed earless lizard *Holbrookia lacerata lacerata*

Habitat description is not available at this time.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G3G4TNR State Rank: S2

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TRAVIS COUNTY

REPTILES

slender glass lizard *Ophisaurus attenuatus*

Prefers relatively dry microhabitats, usually associated with grassy areas. Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil. This species often appears on roads in spring. During inactivity, it occurs in underground burrows. In Kansas, slender glass lizards were scarce in heavily grazed pastures, increased as grass increased with removal of grazing, and declined as brush and trees replaced grass (Fitch 1989). Eggs are laid underground, under cover, or under grass clumps (Ashton and Ashton 1985); in cavities beneath flat rocks or in abandoned tunnels of small mammals (Scalopus, Microtus) (Fitch 1989).

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G5 State Rank: S3

spot-tailed earless lizard *Holbrookia lacerata*

Central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground

Federal Status: State Status: SGCN: Y
Endemic: N Global Rank: G3G4 State Rank: S2

Texas garter snake *Thamnophis sirtalis annectens*

Irrigation canals and riparian-corridor farmlands in west; marshy, flooded pastureland, grassy or brushy borders of permanent bodies of water; coastal salt marshes. Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August.

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G5T4 State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area. Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September.

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G4G5 State Rank: S3

Texas map turtle *Graptemys versa*

Rivers with moderate current, abundant aquatic vegetation, and basking logs; also associated oxbows and lakes (Bartlett and Bartlett 1999).

Federal Status: State Status: SGCN: Y
Endemic: Y Global Rank: G4 State Rank: SU

Texas tortoise *Gopherus berlandieri*

Open brush with a grass understory is preferred; open grass and bare ground are avoided. Seasonally flooded tidal flats are not utilized. When inactive occupies shallow depressions at base of bush or cactus, sometimes in underground burrows or under objects; longevity greater than 50 years; active March-November; breeds April-November

Federal Status: State Status: T SGCN: Y
Endemic: N Global Rank: G4 State Rank: S2

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TRAVIS COUNTY

REPTILES

timber (canebrake) rattlesnake *Crotalus horridus*

Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: T | SGCN: Y |
| Endemic: N | Global Rank: G4 | State Rank: S4 |

western box turtle *Terrapene ornata*

Ornate or western box turtles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species; winter burrow depth was 0.5-1.8 meters in Wisconsin (Doroff and Keith 1990), 7-120 cm (average depth 54 cm) in Nebraska (Converse et al. 2002). Eggs are laid in nests dug in soft well-drained soil in open area (Legler 1960, Converse et al. 2002). Very partial to sandy soil.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G5 | State Rank: S3 |

western chicken turtle *Deirochelys reticularia miaria*

Habitat description is not available at this time.

| | | |
|-----------------|-------------------|------------------|
| Federal Status: | State Status: | SGCN: N |
| Endemic: N | Global Rank: G5T5 | State Rank: S2S3 |

PLANTS

arrowleaf milkvine *Matelea sagittifolia*

Most consistently encountered in thornscrub in South Texas; Perennial; Flowering March-July; Fruiting April-July and Dec?

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S3 |

basin bellflower *Campanula reverchonii*

Among scattered vegetation on loose gravel, gravelly sand, and rock outcrops on open slopes with exposures of igneous and metamorphic rocks; may also occur on sandbars and other alluvial deposits along major rivers; flowering May-July

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G2 | State Rank: S2 |

bracted twistflower *Streptanthus bracteatus*

Shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations; populations fluctuate widely from year to year, depending on winter rainfall; flowering mid April-late May, fruit matures and foliage withers by early summer

| | | |
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| Federal Status: C | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G1 | State Rank: S1 |

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TRAVIS COUNTY

PLANTS

Buckley tridens

Tridens buckleyanus

Occurs in juniper-oak woodlands on rocky limestone slopes; Perennial; Flowering/Fruiting April-Nov

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G3G4

State Rank: S3S4

canyon bean

Phaseolus texensis

Narrowly endemic to rocky canyons in eastern and southern Edwards Plateau occurring on limestone soils in mixed woodlands, on limestone cliffs and outcrops, frequently along creeks.

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G2

State Rank: S2

canyon mock-orange

Philadelphus texensis var. *ernestii*

Usually found growing from honeycomb pits on outcrops of Cretaceous limestone exposed as rimrock along mesic canyons, usually in the shade of mixed evergreen-deciduous canyon woodland; flowering April-June, fruit dehiscing September-October

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G2

State Rank: S3

canyon sedge

Carex edwardsiana

Habitat description is not available at this time.

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G3G4

State Rank: S3S4

Correll's false dragon-head

Physostegia correllii

Wet, silty clay loams on streambanks, in creek beds, irrigation channels and roadside drainage ditches; or seepy, mucky, sometimes gravelly soils along riverbanks or small islands in the Rio Grande; or underlain by Austin Chalk limestone along gently flowing spring-fed creek in central Texas; flowering May-September

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G2

State Rank: S2

Engelmann's bladderpod

Physaria engelmannii

Grasslands and calcareous rock outcrops in a band along the eastern edge of the Edwards Plateau, ranging as far north as the Red River (Carr 2015).

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G4

State Rank: S3

glandular gay-feather

Liatriis glandulosa

Occurs in herbaceous vegetation on limestone outcrops (Carr 2015)

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G3

State Rank: S3

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TRAVIS COUNTY

PLANTS

Glass Mountains coral-root *Hexalectris nitida*

Apparently rare in mixed woodlands in canyons in the mountains of the Brewster County, but encountered with regularity, albeit in small numbers, under *Juniperus ashei* in woodlands over limestone on the Edwards Plateau, Callahan Divide and Lampasas Cutplain; Perennial; Flowering June-Sept; Fruiting July-Sept

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|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S3 |

gravelbar brickellbush *Brickellia dentata*

Essentially restricted to frequently-scoured gravelly alluvial beds in creek and river bottoms; Perennial; Flowering June-Nov; Fruiting June-Oct

| | | |
|-----------------|-------------------|------------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3G4 | State Rank: S3S4 |

Greenman's bluet *Houstonia parviflora*

Habitat description is not available at this time.

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

Heller's marbleseed *Onosmodium helleri*

Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone slopes, often in more mesic portions of canyons; Perennial; Flowering March-May

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

low spurge *Euphorbia peplidion*

Occurs in a variety of vernal-moist situations in a number of natural regions; Annual; Flowering Feb-April; Fruiting March-April

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

narrowleaf brickellbush *Brickellia eupatorioides var. gracillima*

Moist to dry gravelly alluvial soils along riverbanks but also on limestone slopes; Perennial; Flowering/Fruiting April-Nov

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G5T3 | State Rank: S3 |

net-leaf bundleflower *Desmanthus reticulatus*

Mostly on clay prairies of the coastal plain of central and south Texas; Perennial; Flowering April-July; Fruiting April-Oct

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

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TRAVIS COUNTY

PLANTS

| | | |
|--|--|------------------|
| Plateau loosestrife | <i>Lythrum ovalifolium</i> | |
| Banks and gravelly beds of perennial (or strong intermittent) streams on the Edwards Plateau, Llano Uplift and Lampasas Cutplain; Perennial; Flowering/Fruiting April-Nov | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3G4 | State Rank: S3S4 |
| plateau milkvine | <i>Matelea edwardsensis</i> | |
| Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; Flowering March-Oct; Fruiting May-June | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |
| rock grape | <i>Vitis rupestris</i> | |
| Occurs on rocky limestone slopes and in streambeds; Perennial; Flowering March-May; Fruiting May-July | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S1 |
| scarlet leather-flower | <i>Clematis texensis</i> | |
| Usually in oak-juniper woodlands in mesic rocky limestone canyons or along perennial streams; Perennial; Flowering March-July; Fruiting May-July | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3G4 | State Rank: S3S4 |
| spreading lestdaisy | <i>Chaetopappa effusa</i> | |
| Limestone cliffs, ledges, bluffs, steep hillsides, sometimes in seepy areas, oak-juniper, oak, or mixed deciduous woods, 300-500 m elevation; Perennial; Flowering (May) July-Oct | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3G4 | State Rank: S3S4 |
| Stanfield's beebalm | <i>Monarda stanfieldii</i> | |
| Largely confined to granite sands along the middle course of the Colorado River and its tributaries; Perennial | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |
| sycamore-leaf snowbell | <i>Styrax platanifolius ssp. platanifolius</i> | |
| Rare throughout range, usually in oak-juniper woodlands on steep rocky banks and ledges along intermittent or perennial streams, rarely far from some reliable source of moisture; Perennial; Flowering April-May; Fruiting May-Aug. | | |
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3T3 | State Rank: S3 |
| Texabama croton | <i>Croton alabamensis var. texensis</i> | |

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TRAVIS COUNTY

PLANTS

In duff-covered loamy clay soils on rocky slopes in forested, mesic limestone canyons; locally abundant on deeper soils on small terraces in canyon bottoms, often forming large colonies and dominating the shrub layer; scattered individuals are occasionally on sunny margins of such forests; also found in contrasting habitat of deep, friable soils of limestone uplands, mostly in the shade of evergreen woodland mottes; flowering late February-March; fruit maturing and dehiscing by early June

| | | |
|-----------------|-------------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3T2 | State Rank: S2 |

Texas almond *Prunus minutiflora*

Wide-ranging but scarce, in a variety of grassland and shrubland situations, mostly on calcareous soils underlain by limestone but occasionally in sandier neutral soils underlain by granite; Perennial; Flowering Feb-May and Oct; Fruiting Feb-Sept

| | | |
|-----------------|-------------------|------------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3G4 | State Rank: S3S4 |

Texas amorphia *Amorpha roemeriana*

Juniper-oak woodlands or shrublands on rocky limestone slopes, sometimes on dry shelves above creeks; Perennial; Flowering May-June; Fruiting June-Oct

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S3 |

Texas barberry *Berberis swaseyi*

Shallow calcareous stony clay of upland grasslands/shrublands over limestone as well as in loamier soils in openly wooded canyons and on creek terraces; Perennial; Flowering/Fruiting March-June

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

Texas fescue *Festuca versuta*

Occurs in mesic woodlands on limestone-derived soils on stream terraces and canyon slopes; Perennial; Flowering/Fruiting April-June

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: N | Global Rank: G3 | State Rank: S3 |

Texas milk vetch *Astragalus reflexus*

Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; Flowering Feb-June; Fruiting April-June

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

Texas seymeria *Seymeria texana*

Found primarily in grassy openings in juniper-oak woodlands on dry rocky slopes but sometimes on rock outcrops in shaded canyons; Annual; Flowering May-Nov; Fruiting July-Nov

| | | |
|-----------------|-----------------|----------------|
| Federal Status: | State Status: | SGCN: Y |
| Endemic: Y | Global Rank: G3 | State Rank: S3 |

DISCLAIMER

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TRAVIS COUNTY

PLANTS

tree dodder

Cuscuta exaltata

Parasitic on various *Quercus*, *Juglans*, *Rhus*, *Vitis*, *Ulmus*, and *Diospyros* species as well as *Acacia berlandieri* and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S3

turnip-root scurfea

Pediomelum cyphocalyx

Grasslands and openings in juniper-oak woodlands on limestone substrates on the Edwards Plateau and in north-central Texas (Carr 2015).

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G3G4

State Rank: S3S4

Warnock's coral-root

Hexalectris warnockii

In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; in the Trans Pecos in oak-pinyon-juniper woodlands in higher mesic canyons (to 2000 m [6550 ft]), primarily on igneous substrates; in Terrell County under *Quercus fusiformis* mottes on terraces of spring-fed perennial streams, draining an otherwise rather xeric limestone landscape; on the Callahan Divide (Taylor County), the White Rock Escarpment (Dallas County), and the Edwards Plateau in oak-juniper woodlands on limestone slopes; in Gillespie County on igneous substrates of the Llano Uplift; flowering June-September; individual plants do not usually bloom in successive years

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G2G3

State Rank: S2

Wright's milkvetch

Astragalus wrightii

Habitat description is not available at this time.

Federal Status:

State Status:

SGCN: Y

Endemic: Y

Global Rank: G3

State Rank: S3

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