



Draft Report

Tier I Site Assessment & Biological Evaluation Form Documentation

Interstate Highway 10 from State Highway 46 to
Farm-to-Market Road 3351

Bexar and Kendall Counties, Texas

CSJs: 0072-06-082 & 0072-07-075

December 2018

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.

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1.0 Introduction and Purpose

The Texas Department of Transportation (TxDOT) San Antonio District proposes to improve Interstate Highway 10 (I-10) from State Highway (SH) 46 to Farm-to-Market Road (FM) 3351 (Ralph Fair Road) in Bexar and Kendall Counties, Texas (project). The project is located within the city limits of Boerne, Fair Oaks Ranch, and San Antonio as well as the census-designated area of Scenic Oaks.

A *Project Description Memorandum* (provided under separate cover) has been prepared and includes a comprehensive description of the existing facility and proposed action for the project.

The purpose of this report is to present the evaluation of biological resources and potential regulatory issues associated with the proposed improvements to I-10, including the potential for coordination with Texas Parks and Wildlife Department (TPWD) pursuant to the TxDOT-TPWD Memorandum of Understanding (MOU) executed in September of 2014. **Attachment A – Tier I Site Assessment Form, Attachment B – Biological Evaluation Form, and Attachment C – Supporting Documentation** provide the relevant materials required to conduct Early Coordination with TPWD under the MOU.

2.0 General Description of the Project Area

Land Use

The project area is a mixture of urbanized and undeveloped land uses and is surrounded by pockets of developed residential land, educational facilities, a military facility [Camp Stanley U.S. Army Storage Activity], light industrial facilities, places of worship, public and private utilities, and agricultural land. Adjacent to I-10, there are several large tracts of undeveloped land that are zoned primarily for commercial, residential, mixed use, and industrial use as well as several tracts outside of city limits.

Geology & Soils

The project area is located in the Edwards Plateau Ecoregion. The topography includes flatland and rolling hills. The elevation along the I-10 corridor increases from approximately 1,150 feet above mean sea level (amsl) at the southeast end of the project to approximately 1,460 feet amsl near the northwest end of the project. The total relief throughout the project area is approximately 310 feet. The project area is located within the Balcones Fault Zone, also known as the Balcones Escarpment. This geologic fault zone is several miles wide and serves as the transition between the Edwards Plateau to the west and the Coastal Plains to the east. The geology of the project area is primarily made up of upper and lower Glen Rose Formations. Two small portions of the project area near SH 46 and Balcones Creek lies over fluvial terrace deposits.

The Natural Resources Conservation Service (NRCS) Web Soil Survey was reviewed to determine the type and location of soils within the project area. The soils within the I-10 project area are a mixture of silty clays and clay loams with varying slopes and infiltration characteristics. Due to the level of disturbance within the I-10 right-of-way, it is likely that the majority of the project area soils have been altered, compacted, or previously mixed with roadside fill material during construction of the transportation infrastructure or adjacent development.

Hydrology

The project is within the San Antonio River basin and is located within the headwaters of the Cibolo Creek and Leon Creek Watersheds and the I-10 corridor crosses Balcones Creek, Menger Creek, Frederick Creek, and several unnamed tributaries. Portions of the proposed project area are located within the mapped 100-year floodplain and the project area is located over the Edwards Aquifer Contributing and Recharge Zones, within Bexar County.

Vegetation

As described in **Attachments A and C**, the majority of the vegetation observed within the project area is best described as Urban Low Intensity. This vegetation type is dominated by a mixture of various native and non-native grasses and forbs.

Several intact patches of non-urban vegetation occur along the margins of the right-of-way, along fencelines, at creek crossings below bridge infrastructure, and in the drainage easements. These communities included Riparian, Edwards Plateau Savanna, Woodland, and Shrubland, and Disturbed Prairie.

3.0 Threatened, Endangered, and Species of Greatest Conservation Need

Lists of threatened and endangered species maintained by the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) system and TPWD were consulted to determine which species could occur in the proposed project area (**Attachment C**). These species are listed in the Species Impact Table (**Attachment C**), 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 or effect to the species. “Impact” determinations apply to state-listed species and Species of Greatest Conservation Need (SGCN), while “effect” determinations apply only to federally-protected species. The *Tier I Site Assessment* and *Biological Evaluation Form* (**Attachments A and B**, respectively) include an abbreviated summary of this information and reference the relevant best management practices for species subject to the TPWD MOU.

A general habitat assessment for each species was completed utilizing a combination of desktop analysis such as vegetation mapping, soils and geology information (as described above), and field verification by qualified biologists (USFWS Species Recovery Permit # TE168185-3 and TPWD Scientific Research Permit # SPR-0691-409). A field visit in

September 2018 was conducted within the existing right-of-way and easements to assess suitability of habitat for all species.

4.0 Conclusions

Vegetation within the project area was mapped using the EMST vegetation classifications and field verified in September 2018. Several discrepancies were noted between the mapped and observed vegetation communities. The *Tier I Site Assessment, Biological Evaluation Form, and Supporting Documentation (Attachments A, B, and C)* provide additional information on the vegetation discrepancies and include anticipated impacts to each community within the project area. According to the *TxDOT-TPWD Threshold Table Programmatic Agreement (PA)* under the MOU, coordination thresholds for two MOU habitat types (Riparian and Disturbed Prairie) would be exceeded.

Although several federally listed species are noted to be within range of the proposed project, no suitable habitat for any of these species was identified during the site visit. Therefore, no effects to any federally listed species are anticipated. The project area contains suitable habitat for a number of state-listed species and Species of Greatest Conservation Need. The *TxDOT-TPWD Best Management Practices (BMP) PA* identifies several BMPs that are available for use. The *BMP PA* does not include BMPs for plants or insects; therefore, coordination with TPWD for these species would be required.

This report was prepared on behalf of the Texas Department of Transportation by:



Attachment A
Tier I Site Assessment Form



Tier I Site Assessment

Main CSJ: 0072-06-082 & 0072-07-075

Form Prepared By: Meghan P. Lind; CoxMcLain Environmental Consulting

Date of Evaluation: December 3, 2018

Project is classified as a Categorical Exclusion

Proposed Letting Date: September 2019

Project not assigned to TxDOT under the NEPA Assignment MOU

District(s): San Antonio

County(ies): Bexar, Kendall

Roadway Name: Interstate Highway 10 (I-10)

Limits From: State Highway (SH) 46

Limits To: Farm-to-Market Road (FM) 3351

Project Description: Please reference the Project Description Memorandum (provided under separate cover) for a comprehensive description of the existing facility and proposed action for the project. A project location figure is provided in Attachment 1 of the Supporting Documents attachment.

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.

1. Yes Is the project within range of a state threatened or endangered species or SGCN and suitable habitat is present?

*Explain:

The project is within range of and contain suitable habitat for the following species: Big red sage (*Salvia penstemonoides*), Correll's false dragon-head (*Physostegia correllii*), Glass Mountain coral-root (*Hexalectris nitida*), Gravelbar brickellbush (*Brickellia dentata*), Heller's marbleseed (*Onosmodium helleri*), Hill Country wild-mercury (*Argythamnia aphoroides*), Low spurge (*Euphorbia peplidion*), Osage Plain's false foxglove (*Agalinis densiflora*), Parks' jointweed (*Polygonella parksii*), Plateau loosestrife (*Lythrum ovalifolium*), Plateau milkvine (*Matelea edwardsensis*), Sandhill woollywhite (*Hymenopappus carrizoanus*), Scarlet leather-flower (*Clematis texensis*), Siler's huaco (*Manfreda sileri*), Spreading lestdaisy (*Chaetopappa effusa*), Texas fescue (*Festuca versuta*), Texas peachbush (*Prunus texana*), Texas almond (*Prunis minutiflora*), Tree dodder (*Cuscuta exaltata*), A mayfly (*Baetodes allenii*), A mayfly (*Allenhyphes michaeli*), Cascade Caverns salamander (*Eurycea latitans complex*), Texas salamander (*Eurycea neotenes*), Guadalupe bass (*Micropterus treculii*), Texas garter snake (*Thamnophis sirtalis annectens*), and Plains spotted skunk (*Spilogale putorius interrupta*).

See Attachment 2 in the Supporting Documents attachment for TPWD and USFWS county lists and the Species Impact Table.

Date [TPWD County List](#) Accessed: October 23, 2018

Date that the NDD was accessed: June 4, 2018

What agency performed the NDD search? TPWD

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
8999	Big red sage	<i>Salvia pentstemonoides</i>	SGCN	1.5 Mile



NDD Search Results for EOIDs and Tracked Managed Areas

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
598	Black Bear	<i>Ursus americanus</i>	T	1.5 Mile
3831	Bracted twistflower	<i>Streptanthus bracteatus</i>	C	1.5 Mile
9322, 9313	Cascade Caverns Salamander	<i>Eurycea latitans</i>	T	1.5 Mile
7194	Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	LE	1.5 Mile
12415	Hairy Sycamore-leaf Snowbell	<i>Styrax platanifolius var. stellatus</i>	SGCN	1.5 Mile
4529	Rookery	--	--	1.5 Mile
9312, 5455	Texas Salamander	<i>Eurycea neotenes</i>	SGCN	1.5 Mile
14130	Western Hog-nosed Skunk	<i>Conepatus mesoleucus</i>	SGCN	1.5 Mile

 No Does the BMP PA eliminate the requirement to coordinate for all species?

Comments:

There are currently no TPWD approved BMPs for the SGCN plants or mayfly species.

2. No NDD and TCAP review indicates adverse impacts to remnant vegetation?

Comments:

A site visit was conducted following a review of the NDD and TCAP. No remnant vegetation communities were identified within the project area by qualified biologists.

3. No Does the project require a NWP with PCN or IP by USACE?

4. No Does the project include more than 200 linear feet of stream channel for each single and complete crossing of one or more of the following that is not already channelized or otherwise maintained:

5. No Does the project contain known isolated wetlands outside the TxDOT ROW that will be directly impacted by the project?

6. Yes Would the project impact at least 0.10 acre of riparian vegetation?

*Explain:

The proposed project may impact up to 5.07 acres of Riparian vegetation.

7. Yes Does project disturb a habitat type in an area equal to or greater than the area of disturbance indicated in the Threshold Table Programmatic Agreement?



*Explain:

The proposed project may impact up to 7.69 acres of Edwards Plateau, Savanna, Woodland, and Shrubland vegetation (Threshold of 1.0 acre), 5.07 acres of Riparian vegetation (Threshold of 0.1 acre), 3.21 acres of Disturbed Prairie (Threshold of 2.0 acres), and 287.17 acres of Urban Low Intensity areas (no threshold value).

*Attach associated file of EMST output (Mapper Report or other Excel File which includes MOU Type, Ecosystem Name, Common/Vegetation Type Name) in ECOS

Excel File Name:

I-10 Observed Vegetation Report.xls

7.1. Yes Is there a discrepancy between actual habitat(s) and EMST mapped habitat(s)?

*Explain:

The mapped EMST shows a greater diversity of habitat types in the project area than what was observed during field investigations. Maintained right-of-way is mapped as various vegetation types including Savanna Grassland, Riparian, Agriculture, Barren, Woodlands, and Shrublands. Vegetation in the field was observed to have relatively small patches of Woodland and Shrubland, Riparian, and Disturbed Prairie vegetation, however, the majority of the proposed project area is maintained right-of-way, classified as Urban Low Intensity habitat type. The patches of intact non-urban vegetation occur along the margins of the right-of-way, along fencelines, at creek crossings below bridge infrastructure, and in the drainage easements. As the I-10 corridor is a major transportation system, the majority of the project area has been modified to accommodate travel lanes, overpasses, grassy medians and shoulders, and connections with surface streets. Several sections of I-10 within the project area are currently under construction.

Attach file showing discrepancy between actual and EMST mapped habitat(s).

File Name:

Supporting Documents Attachments:
4 - EMST Mapped Vegetation Figure and Table
5 - Observed Vegetation Figure and Table
7 - Project Area Photographs

Is TPWD Coordination Required?

Yes

Early Coordination

Administrated Coordination - Must be conducted through ENV-NRM

BMPs Implemented or EPICs included (as necessary):

Plains Spotted Skunk

• Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.

Texas Salamander & Cascade Caverns Salamander - Amphibian BMPs

• Minimize impacts to wetland habitats including isolated ephemeral pools

Unless absence of the species can be demonstrated, assume presence in suitable habitat and implement the following BMPs. Absence can only be demonstrated using TPWD-approved survey efforts (contact TPWD for minimum survey protocols for species and project site conditions).

1. For projects within one mile of a known occupied location or observation of the species recorded from 1980



until the current year and suitable habitat is present, coordinate with TPWD.

2. For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:

- a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
- b) Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats.
- c) Maintain hydrologic regime and connections between wetlands and other aquatic features.
- d) Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
- e) 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, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
- f) Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
- g) When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
- h) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.
- i) If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlet and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

Guadalupe Bass - Fish BMPs

- For projects within the range of a SGCN or State-Listed fish and work is adjacent to water: Water Quality BMPs. No TPWD Coordination required.
- For projects within the range of a SGCN or State-Listed fish, and work is in the water: TPWD coordination required.

Texas Garter Snake - Terrestrial Reptile BMPs

- 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.

TxDOT Contact Information

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Phone Number: 210-615-5838



Tier I Site Assessment

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Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Impact Table

NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)

EMST Project MOU Summary Table (Required for TPWD Coordination)

TPWD SGCN List

Photos (Required for TPWD Coordination)

Previous TPWD Coordination Documentation (if applicable)

Attachment B
Biological Evaluation Form



Biological Evaluation Form

Main CSJ: 0072-06-082 & 0072-07-075

Form Prepared By: Meghan P. Lind; CoxMcLain Environmental Consulting

Date of Evaluation: December 3, 2018

Project has no Federal nexus.

Proposed Letting Date: September 2019

Project not assigned to TxDOT under the NEPA Assignment MOU

District(s): San Antonio

County(ies): Bexar, Kendall

Roadway Name: Interstate Highway 10 (I-10)

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Endangered Species Act (ESA)

Yes Is the action area of the proposed project within the range of federally protected species?

Yes Did the USFWS IPaC system identify any endangered species that may occur or could potentially be affected by the proposed project activities?

Date that the IPaC system was accessed: October 23, 2018

Yes Is the action area of the proposed project in suitable habitat of federally protected species?

No Would the proposed project affect protected species and/or their habitat?

*Explain:

According to the USFWS IPaC, the proposed project is within range of the following federally protected species: Golden-cheeked Warbler (*Setophaga [Dendroica] chrysoparia*), Least Tern (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), Red Knot (*Calidris canutus rufa*), Whooping Crane (*Grus americana*), San Marcos salamander (*Eurycea nana*), Texas blind salamander (*Typhlomolge rathbuni*), Fountain Darter (*Etheostoma fonticola*), two unnamed ground beetles (*Rhadine exilis* and *Rhadine infernalis*), Comal Springs dryopid beetle (*Stygoparnus comalensis*), Comal Springs riffle beetle (*Heterelmis comalensis*), Helotes mold beetle (*Batrissodes venyivi*), Braken Bat Cave meshweaver (*Cicurina venii*), Cokendolpher Cave harvestman (*Texella cokendolpheri*), Government Canyon Bat Cave meshweaver (*Cicurina vespera*), Government Canyon Bat Cave spider (*Neoleptoneta microps*), Madla's Cave meshweaver (*Cicurina madla*), Robber Baron Cave meshweaver (*Cicurina baronia*), Peck's Cave amphipod (*Stygobromus [=Stygonectes] pecki*), Texas wild-rice (*Zizania texana*), and Tobusch fishhook cactus (*Sclerocactus brevihamatus* ssp. *tobuschii*).

The proposed project is also within range of the bracted twistflower (*Streptanthus bracteatus*), golden orb (*Quadrula aurea*), Texas fatmucket (*Lampsilis bracteata*), and Texas pimpleback (*Quadrula petrina*), which are candidates for federal listing. Due to the periodic drying of streams within the project area during drought



years, no suitable habitat for the any of the candidate mussel species occurs at the water crossings.

The Least Tern, Piping Plover, and Red Knot are identified as within range of the proposed project, however, the USFWS only considers potential effects to these species in cases of wind energy projects.

Suitable habitat does not exist within the project area for the remaining federally listed species and no critical habitat for any listed species occurs within the project area. Effect determinations and pertinent project information for each species are included in the Species Impact Table, included as Attachment 2 in the Supporting Documents attachment.

Resources consulted or activities conducted to make effect determination (if applicable):

- TPWD County List USFWS Critical Habitat Maps Species Expert Consulted
- Aerial Photography Coastal Areas Maps Site Visit
- Topographic Map Species Study Conducted Karst Zone Maps
- Ecological Mapping System of Texas (EMST) Natural Diversity Database (NDD)

Other:

Field visit conducted on 9/17/2018; USFWS Official Species List obtained 10/23/2018.

Migratory Bird Treaty Act (MBTA)

Yes Is there potential for nesting birds to be present in the project action area during construction?

No Were active nests identified during the site survey?

Yes Will BMPs will be incorporated to protect migratory bird nests?

Comments:

Several bridge and culvert structures were noted to have evidence of nesting birds (inactive mud nests) although no active nests were identified during field investigation.

Bald and Golden Eagle Protection Act (BGEPA)

No Does the proposed project have the potential to impact Bald or Golden Eagles?

Fish and Wildlife Coordination Act (FWCA)

Yes Does the project have impacts on one or more Waters of the U.S. or wetlands?

Yes Is the project covered by a Nationwide Permit?

No Is the project covered by an Individual Permit from the USACE?



Executive Order 13112 on Invasive Species

 Yes Would the proposed project be in compliance with EO 13112?

Executive Memorandum on Environmentally and Economically Beneficial Landscaping

 No Would landscaping be included in the proposed projects?

Farmland Protection Policy Act (FPPA)

 No Would the project require new ROW or permanent easements (Do not include temporary easements)?

General Comments

Please see the Supporting Documents attachment for relevant figures, site photographs, species lists, and the Species Impact Table.



Findings

Endangered Species Act (ESA)

According to the U.S. Fish and Wildlife Service (USFWS), the project action area is within the range and in suitable habitat of a federally protected species. Based on the following information, the proposed project will not affect protected species and/or their habitat and will not impact areas that have been designated as critical habitat by the USFWS.

According to the USFWS IPaC, the proposed project is within range of the following federally protected species: Golden-cheeked Warbler (*Setophaga [Dendroica] chrysoparia*), Least Tern (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), Red Knot (*Calidris canutus rufa*), Whooping Crane (*Grus americana*), San Marcos salamander (*Eurycea nana*), Texas blind salamander (*Typhlomolge rathbuni*), Fountain Darter (*Etheostoma fonticola*), two unnamed ground beetles (*Rhadine exilis* and *Rhadine infernalis*), Comal Springs dryopid beetle (*Stygoparnus comalensis*), Comal Springs riffle beetle (*Heterelmis comalensis*), Helotes mold beetle (*Batrisodes venyivi*), Braken Bat Cave meshweaver (*Cicurina venii*), Cokendolpher Cave harvestman (*Texella cokendolpheri*), Government Canyon Bat Cave meshweaver (*Cicurina vespera*), Government Canyon Bat Cave spider (*Neoleptoneta microps*), Madla's Cave meshweaver (*Cicurina madla*), Robber Baron Cave meshweaver (*Cicurina baronia*), Peck's Cave amphipod (*Stygobromus [=Stygonectes] pecki*), Texas wild-rice (*Zizania texana*), and tobusch fishhook cactus (*Sclerocactus brevihamatus* ssp. *tobuschii*).

The proposed project is also within range of the bracted twistflower (*Streptanthus bracteatus*), golden orb (*Quadrula aurea*), Texas fatmucket (*Lampsilis bracteata*), and Texas pimpleback (*Quadrula petrina*), which are candidates for federal listing. Due to the periodic drying of streams within the project area during drought years, no suitable habitat for the any of the candidate mussel species occurs at the water crossings.

The Least Tern, Piping Plover, and Red Knot are identified as within range of the proposed project, however, the USFWS only considers potential effects to these species in cases of wind energy projects.

Suitable habitat does not exist within the project area for the remaining federally listed species and no critical habitat for any listed species occurs within the project area. Effect determinations and pertinent project information for each species are included in the Species Impact Table, included as Attachment 2 in the Supporting Documents attachment.

Consultation with the U.S. Fish and Wildlife Service (USFWS) will not be required. The USFWS IPaC website was accessed on October 23, 2018.

Essential Fish Habitat (EFH)

Tidally influenced waters do not occur within the project action area. Coordination with National Marine Fisheries Service is not required.

Coastal Barrier Resources Act (CBRA)

This project is not located within a designated CBRA map unit. Coordination with the U.S. Fish and Wildlife Service (USFWS) is not required.

Marine Mammal Protection Act (MMPA)

Marine mammals are protected under the Marine Mammal Protection Act (MMPA). The Texas coast provides suitable habitat and is within range of several marine mammals including the West Indian Manatee (*Trichechus manatus*), and bottlenose dolphin (*Tursiops truncatus*).

The project area does not contain suitable habitat for marine mammals. Coordination with NMFS is not required.



Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations.

A site survey did not identify active nests within the project action area. While no impact to migratory birds is expected, TxDOT will take all appropriate actions to prevent the take of migratory birds, their active nests, eggs, or young should they be discovered on the project site. Direction to contractors is provided on the standard EPIC sheet.

Bald and Golden Eagle Protection Act (BGEPA)

The proposed project does not have the potential to impact Bald or Golden Eagles.

Fish and Wildlife Coordination Act (FWCA)

The Fish and Wildlife Coordination Act (FWCA) of 1958 requires that federal agencies obtain comments from USFWS and TPWD. This coordination is required whenever a project involves impounding, diverting, or deepening a stream channel or other body of water.

The proposed project is authorized under a Section 404 of the Clean Water Act Nationwide Permit; therefore, no coordination under FWCA would be required.

Executive Order 13112 on Invasive Species (EO 13112)

Re-vegetation of disturbed areas would be in compliance with the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.

Executive Memorandum on Beneficial Landscaping

Landscaping is not part of the proposed project. If revegetation is needed, disturbed areas would be revegetated according to TxDOT's standard practices, which to the extent practicable, complies with Executive Memorandum on Environmentally and Economically Beneficial Landscaping. Direction to contractors is provided on the standard EPIC sheet.

Farmland Protection Policy Act (FPPA)

Coordination with the National Resources Conservation Service for FPPA would not be required because the project requires no additional ROW or permanent easements.



Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Impact Table

NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)

NOAA EFH Mapper Printout

USFWS CBRA Mapper Printout

EMST Project MOU Summary Table (Required for TPWD Coordination)

TPWD SGCN List

FPPA Documentation

NRCS Web Soil Survey Map

Census Bureau Urbanized Area Map

Landscaping Plans

Photos (Required for TPWD Coordination)

Previous TPWD Coordination Documentation (if applicable)

Attachment C
Supplemental Documentation

I-10 Improvements Project Supporting Documents

Attachment 1

- Project Location Map – Aerial

Attachment 2

- USFWS Official Species List
- TPWD Annotated County List of Rare Species
- Species Impact Table

Attachment 3

- TXNDD Element of Occurrence (EO) Map

Attachment 4

- EMST Vegetation Map
- EMST Report

Attachment 5

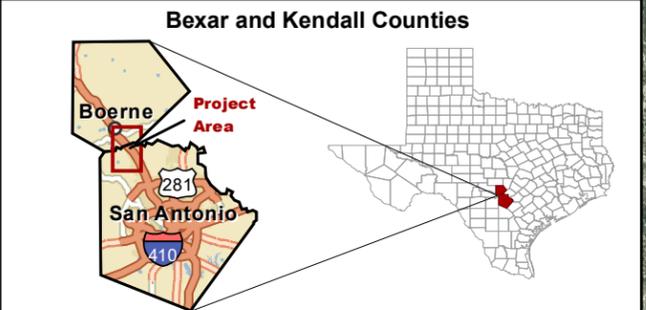
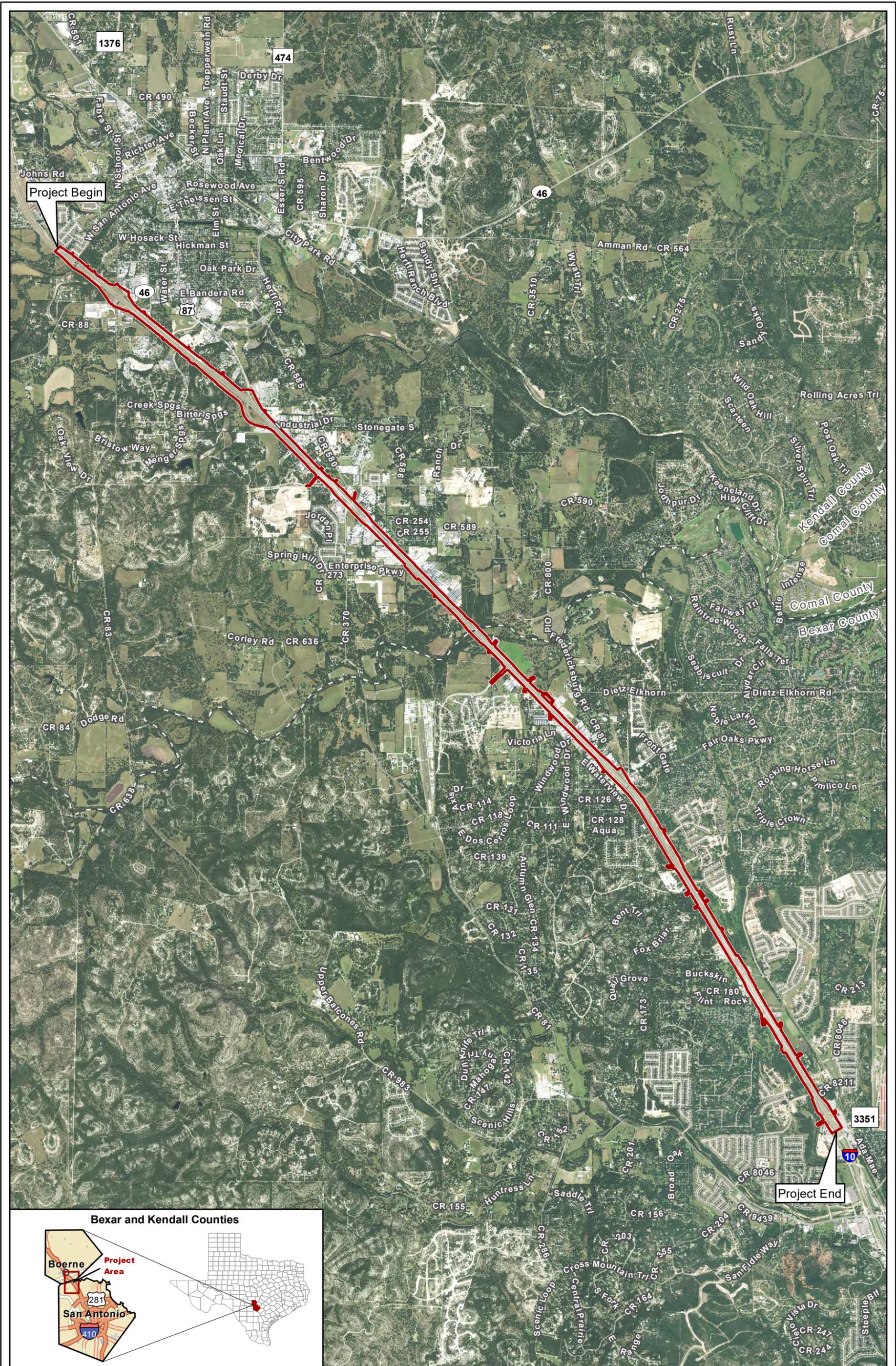
- Observed Vegetation Map
- Observed EMST Vegetation Table

Attachment 6

- Project Area Photographs

Attachment 1

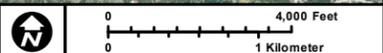
Project Location Map (Aerial)



Project Location
(Aerial Base)

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Project Location



Prepared for: TxDOT	1 in = 4,000 feet
Scale: 1:48,000	
Date: 9/10/2018	

Attachment 2

USFWS Official Species List
TPWD Annotated County List of Rare Species
Species Impact Table



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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

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

In Reply Refer To:

October 23, 2018

Consultation Code: 02ETAU00-2019-SLI-0146

Event Code: 02ETAU00-2019-E-00311

Project Name: I-10 Improvements

Subject: 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.
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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
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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

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Project Summary

Consultation Code: 02ETAU00-2019-SLI-0146

Event Code: 02ETAU00-2019-E-00311

Project Name: I-10 Improvements

Project Type: TRANSPORTATION

Project Description: The Texas Department of Transportation (TxDOT) San Antonio District is proposing improvements to Interstate Highway (I-) 10 between Farm-to-Market Road (FM) 3351 (Ralph Fair Road) and State Highway (SH) 46 in Kendall and Bexar Counties, Texas.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/29.731498049918336N98.6793166442202W>



Counties: Bexar, TX | Kendall, TX

Endangered Species Act Species

There is a total of 26 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. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758</p>	Endangered

Amphibians

NAME	STATUS
<p>San Marcos Salamander <i>Eurycea nana</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/6374</p>	Threatened
<p>Texas Blind Salamander <i>Typhlomolge rathbuni</i></p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5130</p>	Endangered

Fishes

NAME	STATUS
Fountain Darter <i>Etheostoma fonticola</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5858	Endangered

Clams

NAME	STATUS
Golden Orb <i>Quadrula aurea</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9042	Candidate
Texas Fatmucket <i>Lampsilis bracteata</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9041	Candidate
Texas Pimpleback <i>Quadrula petrina</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8966	Candidate

Insects

NAME	STATUS
[no Common Name] Beetle <i>Rhadine exilis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6942	Endangered
[no Common Name] Beetle <i>Rhadine infernalis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3804	Endangered
Comal Springs Dryopid Beetle <i>Stygoparnus comalensis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7175	Endangered
Comal Springs Riffle Beetle <i>Heterelmis comalensis</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3403	Endangered
Helotes Mold Beetle <i>Batrisodes venyivi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1149	Endangered

Arachnids

NAME	STATUS
Braken Bat Cave Meshweaver <i>Cicurina venii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7900	Endangered
Cokendolpher Cave Harvestman <i>Texella cokendolpheri</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/676	Endangered
Government Canyon Bat Cave Meshweaver <i>Cicurina vespera</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7037	Endangered
Government Canyon Bat Cave Spider <i>Neoleptoneta microps</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/553	Endangered
Madla's Cave Meshweaver <i>Cicurina madla</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2467	Endangered
Robber Baron Cave Meshweaver <i>Cicurina baronia</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2361	Endangered

Crustaceans

NAME	STATUS
Peck's Cave Amphipod <i>Stygebromus (=Stygonectes) pecki</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8575	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
Texas Wild-rice <i>Zizania texana</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/805	Endangered
Tobusch Fishhook Cactus <i>Sclerocactus brevihamatus ssp. tobuschii</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2221	Threatened

Critical habitats

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

BEXAR COUNTY

AMPHIBIANS

	Federal Status	State Status
Cascade Caverns salamander <i>Eurycea latitans</i> endemic; subaquatic; springs and caves in Medina River, Guadalupe River, and Cibolo Creek watersheds within Edwards Aquifer area		T
Comal blind salamander <i>Eurycea tridentifera</i> endemic; semi-troglobitic; found in springs and waters of caves		T
Texas salamander <i>Eurycea neotenes</i> endemic; troglobitic; springs, seeps, cave streams, and creek headwaters; often hides under rocks and leaves in water; restricted to Helotes and Leon Creek drainages		

ARACHNIDS

	Federal Status	State Status
Bracken Bat Cave meshweaver <i>Cicurina venii</i> small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	LE	
Cokendolpher cave harvestman <i>Texella cokendolpheri</i> small, eyeless harvestman; karst features in north and northwest Bexar County	LE	
Government Canyon Bat Cave meshweaver <i>Cicurina vespera</i> small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	LE	
Government Canyon Bat Cave spider <i>Neoleptoneta microps</i> small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	LE	
Madla Cave meshweaver <i>Cicurina madla</i> small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	LE	
Robber Baron Cave meshweaver <i>Cicurina baronia</i> small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	LE	

BIRDS

	Federal Status	State Status
American Peregrine Falcon <i>Falco peregrinus anatum</i> 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.	DL	T

BEXAR COUNTY

BIRDS

		Federal Status	State Status
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>			
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	

BEXAR COUNTY

CRUSTACEANS

	Federal Status	State Status
A cave obligate crustacean <i>Monodella texana</i> subaquatic, subterranean obligate; underground freshwater aquifers		

FISHES

	Federal Status	State Status
Guadalupe bass <i>Micropterus treculii</i> endemic to perennial streams of the Edward's Plateau region; introduced in Nueces River system		
Toothless blindcat <i>Trogloglanis pattersoni</i> troglobitic, blind catfish endemic to the San Antonio Pool of the Edward's Aquifer		T
Widemouth blindcat <i>Satan eurystomus</i> troglobitic, blind catfish endemic to the San Antonio Pool of the Edward's Aquifer		T

INSECTS

	Federal Status	State Status
A ground beetle <i>Rhadine exilis</i> small, essentially eyeless ground beetle; karst features in north and northwest Bexar County	LE	
A ground beetle <i>Rhadine infernalis</i> small, essentially eyeless ground beetle; karst features in north and northwest Bexar County	LE	
Helotes mold beetle <i>Batrisodes venyivi</i> small, eyeless mold beetle; karst features in northwestern Bexar County and northeastern Medina County	LE	
Manfreda giant-skipper <i>Stallingsia maculosus</i> most skippers are small and stout-bodied; name derives from fast, erratic flight; at rest most skippers hold front and hind wings at different angles; skipper larvae are smooth, with the head and neck constricted; skipper larvae usually feed inside a leaf shelter and pupate in a cocoon made of leaves fastened together with silk		

MAMMALS

	Federal Status	State Status
Black bear <i>Ursus americanus</i> bottomland hardwoods and large tracts of inaccessible forested areas		T
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		
Gray wolf <i>Canis lupus</i> extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	LE	E

BEXAR COUNTY

MAMMALS

	Federal Status	State Status
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
Golden orb <i>Quadrula aurea</i> 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	C	T
Mimic cavesnail <i>Phreatodrobia imitata</i> subaquatic; only known from two wells penetrating the Edwards Aquifer		

REPTILES

	Federal Status	State Status
Spot-tailed earless lizard <i>Holbrookia lacerata</i> 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		
Texas garter snake <i>Thamnophis sirtalis annectens</i> 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		
Texas horned lizard <i>Phrynosoma cornutum</i> 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		T
Texas indigo snake <i>Drymarchon melanurus erebennus</i> Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter		T
Texas tortoise <i>Gopherus berlandieri</i> open brush with a grass understory is preferred; open grass and bare ground are avoided; 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		T
Timber rattlesnake <i>Crotalus horridus</i> swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto		T

BEXAR COUNTY

PLANTS

Federal Status

State Status

Big red sage

Salvia pentstemonoides

Texas endemic; moist to seasonally wet, steep limestone outcrops on seeps within canyons or along creek banks; occasionally on clayey to silty soils of creek banks and terraces, in partial shade to full sun; basal leaves conspicuous for much of the year; flowering June-October

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

Burridge greenthread

Thelesperma burridgeanum

GLOBAL RANK: G3; Sandy open areas; Annual; Flowering March-Nov; Fruiting March-June

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

Elmendorf's onion

Allium elmendorfii

Texas endemic; grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; Perennial; Flowering March-April, May

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

Hairy sycamore-leaf snowbell *Styrax platanifolius* var. *stellatus*

GLOBAL RANK: G3T3; Rare throughout range, in habitats similar to those of var. *platanifolius* - 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-Oct; Fruiting May-Sept

BEXAR COUNTY

PLANTS

Federal Status

State Status

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

Hill Country wild-mercury

Argythamnia aphoroides

Texas endemic; mostly in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clays and clay loams over limestone on rolling uplands, also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes; Perennial; Flowering April-May with fruit persisting until midsummer

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

Osage Plains false foxglove

Agalinis densiflora

GLOBAL RANK: G3; Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct

Parks' jointweed

Polygonella parksii

Texas endemic; mostly found on deep, loose, whitish sand blowouts (unstable, deep, xeric, sandhill barrens) in Post Oak Savanna landscapes over the Carrizo and Sparta formations; also occurs in early successional grasslands, along right-of-ways, and on mechanically disturbed areas; flowering June-late October or September-November

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

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

Sandhill woollywhite

Hymenopappus carrizoanus

Texas endemic; disturbed or open areas in grasslands and post oak woodlands on deep sands derived from the Carrizo Sand and similar Eocene formations; flowering April-June

Siler's huaco

Manfreda sileri

GLOBAL RANK: G3; Rare in a variety of grasslands and shrublands on dry sites; Perennial; Flowering April-July; Fruiting June-July

BEXAR COUNTY

PLANTS

Federal Status State Status

Spreading lestdaisy

Chaetopappa effusa

GLOBAL RANK: G3; 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

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 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 amorphia

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 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

Texas peachbush

Prunus texana

GLOBAL RANK: G3; Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; Perennial; Flowering Feb-Mar; Fruiting Apr-Jun

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

KENDALL COUNTY

AMPHIBIANS

	Federal Status	State Status
Blanco River springs salamander <i>Eurycea pterophila</i> subaquatic; springs and caves in the Blanco River drainage		
Cascade Caverns salamander <i>Eurycea latitans</i> endemic; subaquatic; springs and caves in Medina River, Guadalupe River, and Cibolo Creek watersheds within Edwards Aquifer area		T
Comal blind salamander <i>Eurycea tridentifera</i> endemic; semi-troglobitic; found in springs and waters of caves		T
Texas salamander <i>Eurycea neotenes</i> endemic; troglobitic; springs, seeps, cave streams, and creek headwaters; often hides under rocks and leaves in water; restricted to Helotes and Leon Creek drainages		

BIRDS

	Federal Status	State Status
American Peregrine Falcon <i>Falco peregrinus anatum</i> 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.	DL	T
Arctic Peregrine Falcon <i>Falco peregrinus tundrius</i> 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.	DL	
Bald Eagle <i>Haliaeetus leucocephalus</i> 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	DL	T
Black-capped Vireo <i>Vireo atricapilla</i> 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	DL	E

KENDALL COUNTY

BIRDS

		Federal Status	State Status
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>			
Sprague's Pipit	<i>Anthus spragueii</i>		
<p>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.</p>			
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>		
<p>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</p>			
Whooping Crane	<i>Grus americana</i>	LE	E
<p>potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties</p>			
Zone-tailed Hawk	<i>Buteo albonotatus</i>		T
<p>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</p>			

CRUSTACEANS

		Federal Status	State Status
Cascade Cave amphipod	<i>Stygobromus dejectus</i>		
<p>subaquatic crustacean; subterranean obligate; in pools</p>			

KENDALL COUNTY

CRUSTACEANS

Federal Status

State Status

Long-legged cave amphipod *Stygobromus longipes*

subaquatic crustacean; subterranean obligate; found in subterranean streams

FISHES

Federal Status

State Status

Guadalupe bass *Micropterus treculii*

endemic to perennial streams of the Edward's Plateau region; introduced in Nueces River system

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

INSECTS

Federal Status

State Status

A mayfly *Baetodes alleni*

mayflies distinguished by aquatic larval stage; adult stage generally found in shoreline vegetation

A mayfly *Allenhyphes michaeli*

TX Hill Country; mayflies distinguished by aquatic larval stage; adult stage generally found in shoreline vegetation

MAMMALS

Federal Status

State Status

Black bear *Ursus americanus*

bottomland hardwoods and large tracts of inaccessible forested areas

T

Cave myotis *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

Gray wolf *Canis lupus*

LE

E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Plains spotted skunk *Spilogale putorius interrupta*

catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Red wolf *Canis rufus*

LE

E

extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies

KENDALL COUNTY

MOLLUSKS

		Federal Status	State Status
False spike mussel	<i>Fusconaia mitchelli</i>		T
possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at the site; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins			
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			
Texas fatmucket	<i>Lampsilis bracteata</i>	C	T
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			
Texas pimpleback	<i>Quadrula petrina</i>	C	T
mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins			

REPTILES

		Federal Status	State Status
Cagle's map turtle	<i>Graptemys caglei</i>		T
endemic; Guadalupe River System; shallow water with swift to moderate flow and gravel or cobble bottom, connected by deeper pools with a slower flow rate and a silt or mud bottom; gravel bar riffles and transition areas between riffles and pools especially important in providing insect prey items; nests on gently sloping sand banks within ca. 30 feet of water's edge			
Spot-tailed earless lizard	<i>Holbrookia lacerata</i>		
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			
Texas garter snake	<i>Thamnophis sirtalis annectens</i>		
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			
Texas horned lizard	<i>Phrynosoma cornutum</i>		T
open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September			

PLANTS

		Federal Status	State Status
Basin bellflower	<i>Campanula reverchonii</i>		
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			

KENDALL COUNTY

PLANTS

Federal Status

State Status

Big red sage

Salvia pentstemonoides

Texas endemic; moist to seasonally wet, steep limestone outcrops on seeps within canyons or along creek banks; occasionally on clayey to silty soils of creek banks and terraces, in partial shade to full sun; basal leaves conspicuous for much of the year; flowering June-October

Boerne 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.

Buckley tridens

Tridens buckleyanus

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

Darkstem noseburn

Tragia nigricans

GLOBAL RANK: G3; Occurs in oak-juniper woodlands on mesic limestone slopes and canyon bottoms; Perennial; Flowering/Fruiting April-Oct

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

Hairy sycamore-leaf snowbell *Styrax platanifolius* var. *stellatus*

GLOBAL RANK: G3T3; Rare throughout range, in habitats similar to those of var. *platanifolius* - 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-Oct; Fruiting May-Sept

Hall's prairie clover

Dalea hallii

GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept

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

Hill Country wild-mercury

Argythamnia aphoroides

Texas endemic; mostly in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clays and clay loams over limestone on rolling uplands, also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes; Perennial; Flowering April-May with fruit persisting until midsummer

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

Scarlet leather-flower

Clematis texensis

KENDALL COUNTY

PLANTS

Federal Status

State Status

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

Spreading lestdaisy *Chaetopappa effusa*

GLOBAL RANK: G3; 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

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 amorphia *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 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

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

Threatened and Endangered Species and Species of Greatest Conservation Need of Potential Occurrence in Bexar and Kendall Counties, Texas

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Plants							
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	Kendall	No	No impact	No loose gravel, gravelly sand, and rock outcrops on open slopes with exposures of igneous and metamorphic rocks or sandbars and other alluvial deposits along major rivers occurs within the project area.
Big red sage <i>Salvia penstemonoides</i>	NL	SGCN	Texas endemic; moist to seasonally wet, steep limestone outcrops on seeps within canyons or along creek banks; occasionally on clayey to silty soils of creek banks and terraces, in partial shade to full sun; basal leaves conspicuous for much of the year; flowering June-October	Both	Yes	May impact	Several moist to seasonally wet creek banks occur within the project area. This species was not observed during field investigations.
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	Bexar	No	No impact	No oak-juniper woodlands on steep to moderate slopes or canyons occur within the project area.
Boerne bean <i>Phaeolus 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.	Kendall	No	No impact	No rocky canyons, cliffs or outcrops occur within the project area. The creek areas within the I-10 project area have been previously modified.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Buckley tridens <i>Tridens buckleyanus</i>	NL	SGCN	Occurs in juniper-oak woodlands on rocky limestone slopes; Perennial; Flowering/Fruiting April-Nov	Both	No	No impact	No juniper-oak woodlands on rocky limestone slopes occur within the project area.
Burridge greenthread <i>Thelesperma burridgeanum</i>	NL	SGCN	Sandy open areas; Annual; Flowering March-November; Fruiting March-June	Bexar	No	No impact	No sandy open areas present within the project area.
Correll's false dragon-head <i>Physostegia correllii</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	Bexar	Yes	May impact	Several seasonally wet creeks occur within the project area. This species was not observed during field investigations.
Darkstem noseburn <i>Tragia nigricans</i>	NL	SGCN	Occurs in oak-juniper woodlands on mesic limestone slopes and canyon bottoms; Perennial; Flowering/Fruiting April-Oct	Kendall	No	No impact	No oak-juniper woodlands on slopes or canyon bottoms occur within the project area.
Elmendorf's onion <i>Allium elmendorffii</i>	NL	SGCN	Texas endemic; grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; Perennial; Flowering March-April, May	Bexar	No	No impact	No grassland openings in oak woodlands in deep sandy soils occur within the project area. The grassy areas within the I-10 project area are regularly maintained.

	Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
	Glass Mountain coral-root <i>Hexalectris nitida</i>	NL	SGCN	Apparently rare in mixed woodlands in canyons in the mountains of the 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	Both	Yes	May impact	The project area includes mixed woodlands over limestone. This species was not observed during field investigations.
	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	Bexar	Yes	May impact	Several creek or stream crossings with scoured alluvial beds occur within the project area. This species was not observed during field investigations.
	Hairy sycamore-leaf snowbell <i>Styrax platanifolius</i> var. <i>stellatus</i>	NL	SGCN	Rare throughout range, in habitats similar to those of var. <i>platanifolius</i> - 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-Oct; Fruiting May-Sept	Both	No	No impact	No oak-juniper woodlands on steep rocky banks or ledges along streams present in the project area.
	Hall's prairie clover <i>Dalea hallii</i>	NL	SGCN	GLOBAL RANK: G3; In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept	Kendall	No	No impact	No grasslands on eroded limestone or oak scrub areas on rock hillsides occur in the project area.
	Heller's marbleseed <i>Onosmodium helleri</i>	NL	SGCN	Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone	Both	Yes	May impact	Potentially suitable soils associated with oak-juniper woodlands occur in the project area. This species was not observed during field investigations.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Hill Country wild-mercury <i>Argythamnia aphoroides</i>	NL	SGCN	Texas endemic; mostly in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clays and clay loams over limestone on rolling uplands, also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes	Both	Yes	May impact	Oak-juniper woodlands and maintained grassy areas with a bluestem-grama component were observed within the project area and adjacent easements. This species was not observed during field investigations.
Low spurge <i>Euphorbia peplidion</i>	NL	SGCN	Occurs in a variety of vernal-moist situations in a number of natural regions; Annual; Flowering Feb-April; Fruiting March-April	Bexar	Yes	May impact	Several creek and stream crossings and drainage easements could be considered vernal moist within the project area. This species was not observed during field investigations.
Narrowleaf brickellbush <i>Brickellia epatorioides</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	Bexar	No	No impact	No limestone slopes or gravelly alluvial soils along riverbanks occur within the project area.
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	Bexar	No	No impact	No clay prairies of the coastal plain occur within the project area.
Osage Plain's false foxglove <i>Agalinis densiflora</i>	NL	SGCN	Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct	Bexar	Yes	May impact	Gravelly, well-drained, calcareous soils occur in various areas of the project site, and this species could subsist within the maintained areas of existing right-of-way that may be impacted by the proposed project. This species was not observed during field investigations.
Parks' jointweed <i>Polygonella parksii</i>	NL	SGCN	Texas endemic; mostly found on deep, loose, whitish sand blowouts (unstable, deep, xeric, sandhill barrens) in Post Oak Savanna landscapes over the Carrizo and Sparta formations; also occurs in early successional grasslands, along right-of-ways, and on mechanically disturbed areas; flowering June-late October or September-November	Bexar	Yes	May impact	Mechanically disturbed areas and right-of-ways exist within the project area. This species was not observed during field investigations.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
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	Bexar	Yes	May impact	This species could occur in association with the streams and drainage easements on the project site. This species was not observed during field investigations.
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	Both	Yes	May impact	Juniper-oak woodlands occur within the project area and drainage easements. This species was not observed during field investigations.
Sandhill woollywhite <i>Hymenopappus carrizoanus</i>	NL	SGCN	Texas endemic; disturbed or open areas in grasslands and post oak woodlands on deep sands derived from the Carrizo Sand and similar Eocene formations; flowering April-June	Bexar	Yes	May impact	Several disturbed and open areas in grassy vegetation and woodlands occur within the project area and drainage easements. This species was not observed during field investigations.
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	Kendall	Yes	May impact	Frederick Creek is identified as a perennial stream by the National Hydrography Dataset; however, a review of historic aerial imagery determined that this creek periodically experiences drought conditions. The normal flow conditions of this stream could provide suitable habitat for this species. This species was not observed during field investigations.
Siler's huaco <i>Manfreda sileri</i>	NL	SGCN	Rare in a variety of grasslands and shrublands on dry sites; Perennial; Flowering April-July; Fruiting June-July	Bexar	Yes	May impact	Maintained grassy areas and shrublands occur within the project area. This species was not observed during field investigations.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Spreading lestdaisy <i>Chaetopappa effusa</i>	NL	SGCN	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	Both	Yes	May impact	Although no limestone cliffs, ledges, bluffs, steep hillsides, or seepy areas occur within the project area, several small patches of oak-juniper, oak, or mixed deciduous woods occur in the project area and easements. This species was not observed during field investigations.
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	Both	No	No impact	No steep, rocky banks or ledges in oak-juniper woodlands occur in the project area.
Texas almond <i>Prunis 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	Bexar	Yes	May impact	Potentially suitable soils and landforms occur within the project area. This species was not observed during field investigations.
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	Both	No	No impact	No woodlands or shrublands on rocky slopes or dry shelves occur in the project area.
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	Both	Yes	May impact	Potentially suitable habitat occurs in the project area that may be affected by the proposed project. This species was not observed during field investigations.
Texas peachbush <i>Prunus texana</i>	NL	SGCN	Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; Perennial; Flowering Feb-Mar; Fruiting Apr-June	Bexar	Yes	May impact	Oak woods occur in the project area and the adjacent drainage easements. This species was not observed during field investigations.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Texas seymeria <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	Both	No	No impact	No potentially suitable slopes or outcrops occur in the project area.
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	Both	Yes	May impact	Potentially suitable host species were identified within the project area and easements. This species was not observed during field investigations.
Texas wild-rice <i>Zizania texana</i>	LE	E*	Texas endemic; spring-fed river, in clear, cool, swift water mostly less than 1 m deep, with coarse sandy soils rather than finer clays; flowering year-round, peaking March-June	Neither	No	No effect	This project occurs outside the occupied range of this species.
Tobusch fishhook cactus <i>Sclerocactus brevihamatus</i> ssp. <i>tobuschii</i>	LT	T*	Texas endemic; shallow, moderately alkaline, stony clay and clay loams over massive fractured limestone; usually on level to slightly sloping hilltops; occasionally on relatively level areas on steeper slopes, and in rocky floodplains; usually open areas within a mosaic of oak-juniper woodlands, occasionally in pine-oak woodlands, rarely in cenizo shrublands or little bluestem grasslands; sites are usually open with only herbaceous cover, although the cactus may be somewhat protected by rocks, grasses, or spikemosses; flowering (late January-) February-March (rarely early April)	Both	No	No effect	The project area is primarily urban vegetation types that are mowed regularly. Open areas with little vegetative cover on fractured limestone do not occur within the project area.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Mollusks							
False spike <i>Quadrula (Fusconaia) mitchelli</i>	NL	T	Native to the Guadalupe and other basins and was presumed extinct until recent surveys confirmed live false spike at several locations throughout its historic range. 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	Kendall	No	No impact	No medium to large rivers are present within the project area. In addition, the project area is within the San Antonio River basin.
Golden orb <i>Quadrula aurea</i>	C	T	Sand and gravel in some locations and mud at others; intolerant of impoundment in most instances; Guadalupe, San Antonio, and Nueces River basins	Both	Yes	No impact	The project area is within the San Antonio River basin. Frederick Creek is identified as a perennial stream by the National Hydrography Dataset; however, a review of historic aerial imagery determined that this creek periodically experiences drought conditions and has dried out, exposing the stream bed within the right-of-way. As this species requires a perennial water source, it would not be reasonably expected to occur within a seasonally or episodically intermittent waterway.
Mimic cavesnail <i>Phreatodrobia imitata</i>	NL	SGCN	Subaquatic; only known from two wells penetrating the Edwards Aquifer	Bexar	No	No impact	No springs or wells are known to occur in the project area.
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; Colorado and Guadalupe River basins	Kendall	No	No impact	The project area is within the San Antonio River basin, which is not known to support this species.

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Texas pimpleback <i>Quadrula petrina</i>	C	T	Mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins	Kendall	No	No impact	The project occurs in the San Antonio River basin, which is not known to support this species.
Crustaceans							
A cave obligate crustacean <i>Monodella texana</i>	NL	SGCN	Subaquatic, subterranean obligate; underground freshwater aquifers	Bexar	No	No impact	The project area occurs outside of all mapped karst zones. No known caves occur in the project area and freshwater aquifers in the area would not be impacted.
Cascade Cave amphipod <i>Stygobromus dejectus</i>	NL	SGCN	Subaquatic crustacean; subterranean obligate; in pools	Kendall	No	No impact	Project occurs outside of all mapped karst zones. No known caves occur in the project area and freshwater aquifers in the area would not be impacted.
Long-legged cave amphipod <i>Stygobromus longipes</i>	NL	SGCN	Subaquatic crustacean; subterranean obligate; found in subterranean streams	Kendall	No	No impact	Project occurs outside of all mapped karst zones. No known caves occur in the project area and freshwater aquifers in the area would not be impacted.
Peck's Cave amphipod <i>Stygobromus (=Stygonectes) pecki</i>	LE	E*	Small, aquatic crustacean; lives underground in the Edwards Aquifer; collected at Comal Springs and Hueco Springs	Both	No	No effect	The project does not occur near Comal or Hueco Springs. This species would not be reasonably expected to occur within the project area.
Insects							
A ground beetle <i>Rhadine exilis</i>	LE	SGCN	Small, essentially eyeless ground beetle; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
A ground beetle <i>Rhadine infernalis</i>	LE	SGCN	Small, essentially eyeless ground beetle; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.

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A mayfly <i>Baetodes alleni</i>	NL	SGCN	Mayflies distinguished by aquatic larval stage; adult stage generally found in shoreline vegetation.	Kendall	Yes	May impact	Several intermittent streams with shoreline vegetation occur within the project area and adjacent drainage easements.
A mayfly <i>Allenhyphes michaeli</i>	NL	SGCN	Texas Hill County; mayflies distinguished by aquatic larval stage; adult stage generally found in shoreline vegetation.	Kendall	Yes	May impact	Several intermittent streams with shoreline vegetation occur within the project area and adjacent drainage easements.
Comal Springs dryopid beetle <i>Stygoparnus comalensis</i>	LE	E*	Dryopids usually cling to objects in a stream; dryopids are sometimes found crawling on stream bottoms or along shores; adults may leave the stream and fly about, especially at night; most dryopid larvae are vermiform and live in soil or decaying wood	Both	No	No effect	The project area is not located within close proximity, nor does it drain to to any of the known, occupied spring locations (Fern Bank Spring and Comal Springs) for this species.
Comal Springs riffle beetle <i>Heterelmis comalensis</i>	LE	E*	Comal and San Marcos Springs.	Both	No	No effect	The project area does not occur within close proximity, no does it drain to Comal or San Marcos Springs.
Helotes mold beetle <i>Batrisodes venyivi</i>	LE	SGCN	Small, eyeless mold beetle; karst features in northwestern Bexar County and northeastern Medina County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Manfreda giant-skipper <i>Stallingsia maculosus</i>	NL	SGCN	Most skippers are small and stout-bodied; name derives from fast, erratic flight; at rest, most skippers hold front and hind wings at different angles; skipper larvae are smooth, with the head and neck constricted; skipper larvae usually feed inside a leaf shelter and pupate in a cocoon made of leaves fastened together with silk	Bexar	No	No impact	The host plant for this species, Texas tuberose (<i>Manfreda maculosa</i>) is native to arid environments in south Texas and Mexico. This agave like plant would not be reasonably expected to occur in the project area. No individuals of this species or the host plant were observed during field investigation.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Arachnids							
Bracken Bat Cave meshweaver <i>Cicurina venii</i>	LE	SGCN	Small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Cokendolpher cave harvestman <i>Texella cokendolpheri</i>	LE	SGCN	Small, eyeless harvestman; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Government Canyon Bat Cave meshweaver <i>Cicurina vespera</i>	LE	SGCN	Small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Government Canyon Bat Cave spider <i>Tayshaneta microps</i>	LE	SGCN	Small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Madla Cave meshweaver <i>Cicurina madla</i>	LE	SGCN	Small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Robber Baron Cave meshweaver <i>Cicurina baronia</i>	LE	SGCN	Small, eyeless, or essentially eyeless spider; karst features in north and northwest Bexar County	Bexar	No	No effect	Project occurs outside of all mapped karst zones.
Fishes							
Guadalupe Bass <i>Micropterus treculii</i>	NL	SGCN	Endemic to perennial streams of the Edward's Plateau region; introduced in Nueces River system	Both	Yes	May impact	Frederick Creek is identified as a perennial stream by the National Hydrography Dataset; however, a review of historic aerial imagery determined that this creek periodically experiences drought conditions. The normal flow conditions of this stream could provide suitable habitat for this species during most years. BMPs would be in place to avoid impacts to water quality during construction.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Headwater Catfish <i>Ictalurus lupus</i>	NL	SGCN	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	Kendall	No	No impact	Project does not occur within the Rio Grande drainage.
Fountain darter <i>Etheostoma fonticola</i>	LE	E*	Known only from the San Marcos and Comal rivers; springs and spring-fed streams in dense beds of aquatic plants growing close to bottom, which is normally mucky; feeding mostly diurnal; spawns year-round with August and late winter to early spring peaks	Both	No	No effect	The project does not include, nor does it drain to the San Marcos or the Comal River.
Toothless Blindcat <i>Trogloglanis pattersoni</i>	NL	T	Troglobitic, blind catfish endemic to the San Antonio Pool of the Edward's Aquifer	Bexar	No	No impact	Although the project occurs within the San Antonio segment of the Edwards Aquifer, the project is primarily within the contributing zone. No aquifer impacts are expected as a result of the proposed improvements.
Widemouth Blindcat <i>Satan eurystomus</i>	NL	T	Troglobitic, blind catfish endemic to the San Antonio Pool of the Edward's Aquifer	Bexar	No	No impact	Although the project occurs within the San Antonio segment of the Edwards Aquifer, the project is primarily within the contributing zone. No aquifer impacts are expected as a result of the proposed improvements.
Amphibians							
Blanco River Springs salamander <i>Eurycea pterophila</i>	NL	SGCN	Subaquatic; springs and caves in the Blanco River drainage.	Kendall	No	No impact	Project does not occur within the Blanco River drainage.

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Cascade Caverns salamander <i>Eurycea latitans complex</i>	NL	T	Endemic; subaquatic; springs and caves in Medina River, Guadalupe River, and Cibolo Creek watersheds within Edwards Aquifer area	Both	Yes	May impact	The project occurs within the Cibolo Creek watershed. No known caves or other karst formations occur in the project area, nor do any springs or spring runs. Although one TxNDD record for this species occurs within 1.5 miles of the project area, aquifer impacts are not anticipated for this project and standard BMPs to protect water quality would be incorporated into the project design in compliance with the Edwards Aquifer Rules. According to the Texas Water Development Board Groundwater Data Viewer, wells near the project area encounter water between 55 and +200 feet below surface elevations; therefore, the likelihood of encountering this species in the aquifer during construction is very low.
Comal blind salamander <i>Eurycea tridentiflora</i>	NL	T	Endemic; semi-troglobitic; found in springs and waters of caves	Both	No	No impact	No known caves or other karst formations occur in the project area, nor do any springs or spring runs. No TxNDD records for this species occur within 1.5 miles of the project area.
San Marcos salamander <i>Eurycea nana</i>	LT	T*	Headwaters of the San Marcos River downstream to ca. ½ mile past IH-35; water over gravelly substrate characterized by dense mats of algae (<i>Lyng bya</i>) and aquatic moss (<i>Leptodictym riparium</i>), and water temperatures of 21-22 O C; diet includes amphipods, midge larve, and aquatic snails	Both	No	No effect	The project does not occur in the headwaters of the San Marcos River.

	Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
	Texas blind salamander <i>Typhlomolge rathbuni</i>	LE	E*	Troglobitic; water-filled subterranean caverns along a six mile stretch of the San Marcos Spring Fault, in the vicinity of San Marcos; eats small invertebrates, including snails, copepods, amphipods, and shrimp	Both	No	No effect	The project does not occur along the San Marcos Spring Fault or in the vicinity of San Marcos.
	Texas salamander <i>Eurycea neotenes</i>	NL	SGCN	Endemic; troglobitic; springs, seeps, cave streams, and creek headwaters; often hides under rocks and leaves in water; restricted to Helotes and Leon Creek drainages	Both	Yes	May impact	Project occurs within the headwaters of the Leon Creek drainage. No known caves or other karst formations occur in the project area, nor do any springs or spring runs. Although one TxNDD record for this species occurs within 1.5 miles of the project area, aquifer impacts are not anticipated for this project and standard BMPs to protect water quality would be incorporated into the project design in compliance with the Edwards Aquifer Rules. According to the Texas Water Development Board Groundwater Data Viewer, wells near the project area encounter water between 55 and +200 feet below surface elevations; therefore, the likelihood of encountering this species in the aquifer during construction is very low.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Reptiles							
Cagle's map turtle <i>Grptemys caglei</i>	NL	T	Endemic; Guadalupe River System; shallow water with swift to moderate flow and gravel or cobble bottom, connected by deeper pools with a slower flow rate and a silt or mud bottom; gravel bar riffles and transition areas between riffles and pools especially important in providing insect prey items; nests on gently sloping sand banks within ca. 30 feet of water's edge	Kendall	No	No impact	The project does not occur within the Guadalupe River system.
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	Both	No	No impact	No flat areas free of vegetation occur in the project area.
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	Both	Yes	May impact	The species could occur in the project area in association with creek crossings or ephemeral pools.
Texas horned lizard <i>Phrynosoma cornutum</i>	NL	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September	Both	No	No impact	No sparse vegetation occurs within the project area. No red harvester ants (a primary food source for the species) were observed during field investigations.
Texas indigo snake <i>Drymarchon melanurus erebennus</i>	NL	T	Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter	Bexar	No	No impact	No suitable thornbush-chaparral woodlands or irrigated croplands occur within the project area.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Texas tortoise <i>Gopherus berlandieri</i>	NL	T	Open brush with a grass understory is preferred; open grass and bare ground are avoided; 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	Bexar	No	No impact	No unmaintained open brushy areas with a grass understory occur in the project area.
Timber rattlesnake <i>Crotalus horridus</i>	NL	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto	Bexar	No	No impact	Although several small riparian areas occur within the project area and easements, the vegetation at these locations is not typical of habitat for these species (i.e. no dense ground cover, palmetto, or upland pine woodlands).
Birds							
American Peregrine Falcon <i>Falco peregrinus anatum</i>	DL	T	Resident in west Texas; migrant across rest of state; winters along coast and farther south; occupies wide range of habitats during migration, including urban, with stopovers at leading landscape edges	Both	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	Winters along the coast and farther south. Occupies a wide range of habitats during migration including urban and leading landscape edges such as lake shores, coastlines, etc.	Both	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; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	Kendall	No	No impact	No rivers or large lakes, tall trees or cliffs near water occur within or adjacent to the project area.

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Black-capped Vireo <i>Vireo atricapilla</i>	DL	E	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer	Both	No	No Impact	No oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces are located in the project area.
Golden-cheeked Warbler <i>Dendroica (=Setophaga) chrysoparia</i>	LE	E	Juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer	Both	No	No effect	Although juniper-oak woodlands occur in the project area, neither the age classes nor the composition of the woodlands is suitable for this species. Therefore, no suitable vegetation communities that would support this species occur within the project area or within 300 feet of the project area.
Interior least tern <i>Sterna antillarum athalassos</i>	LE	E	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	Both	No	No effect	The USFWS only considers impacts to this species for wind energy projects. No suitable habitat occurs in the project area.
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	Both	No	No impact	No high plains or shortgrass prairie, or plowed field occur within the project area.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Piping Plover <i>Charadrius melodus</i>	LT	T	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	Neither	No	No effect	The USFWS only considers impacts to this species for wind energy projects. No suitable habitat occurs in the project area.
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. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters.	Bexar	No	No effect	The USFWS only considers impacts to this species for wind energy projects. No suitable habitat occurs in the project area. The species is a potential migrant.
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	Both	No	No impact	The species is a potential migrant, though the prevalence of edges and lack of upland prairie in the project area renders the project unsuitable as habitat for this species.
Western Burrowing Owl <i>Athene cunicularia hypugea</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	Both	No	No impact	The species is a potential migrant through the project area; however, the project site is outside of the typical breeding range. No abandoned burrows were observed during field investigation.
White-faced Ibis <i>Plegadis chihi</i>	NL	T	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	Bexar	No	No impact	No suitable habitat occurs in the project area.

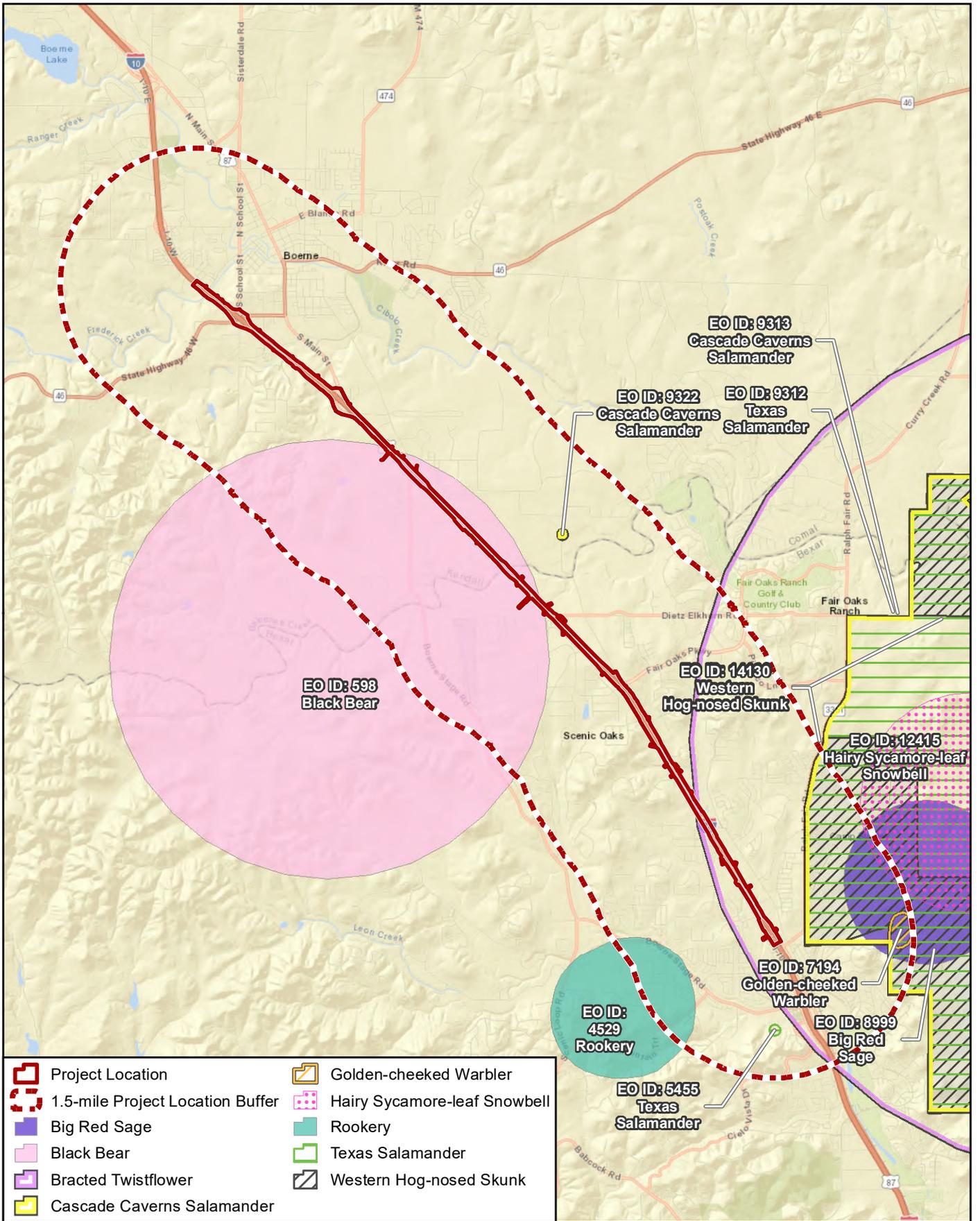
Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Whooping Crane <i>Grus americana</i>	LE	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio Counties	Both	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 incidental.
Wood stork <i>Mycteria americana</i>	NL	T	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	Bexar	No	No impact	No breeding or roosting habitat is present within the project area. Although ditches and several creek crossings may have shallow standing water, these areas within the I-10 corridor are low quality foraging habitat. The species is a potential migrant; 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 country, 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	Both	No	No impact	No suitable habitat occurs in the project area. The species is a potential migrant.
Mammals							
Black bear <i>Ursus americanus</i>	DL	T	Bottomland hardwoods and large tracts of inaccessible forested areas	Both	No	No impact	No bottomland hardwoods or inaccessible forested areas occur within the project area.

Species	Federal Status	State Status	Habitat Description	County of Occurrence	Habitat Present in Project Area?	Species Effect/ Impact	Pertinent Project Information
Cave myotis bat <i>Myotis velifer</i>	NL	SGCN	Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and 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.	Both	Yes	No impact	The species could potentially occur within the project area in association within existing bridges, culverts, or other natural structures. However, bridge structures were surveyed for evidence of bat occupation (smell, bat noise, staining, etc.) during the site visit and no bats or evidence of bats was observed. Due to the lack of observed evidence of maternity colonies, presence of this species within the project area would be restricted to incidental occurrences and would not be reasonably expected to impact any individuals.
Gray wolf <i>Canis lupus</i>	LE*	E	Extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	Both	No	No effect	Species is extirpated and would not be reasonably expected to occur in Bexar or Kendall Counties.
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	Both	Yes	May impact	This species may occur in unmaintained vegetation in the project area.
Red wolf <i>Canis rufus</i>	LE*	E	Extirpated; formerly known throughout eastern half of Texas in brushy/forested areas and coastal prairies	Both	No	No effect	Species is extirpated and would not be reasonably expected to occur in Bexar and Kendall Counties.
	Status Codes:		LE = Federally-Listed Endangered LT = Federally-Listed Threatened E = State-Listed Endangered T = State-Listed Threatened		SGCN = Species of Greatest Conservation Need NL = Not listed C = Candidate for listing DL = Delisted		* = Species not recognized by the respective agency as occurring within the project area but designated by the opposing agency as potentially occurring within the County

Sources: Texas Parks and Wildlife Department (TPWD). Annotated County Lists of Rare Species: Bexar County (last revision 8/8/2018), Kendall County (last revisions 8/8/2018). U.S. Fish and Wildlife Service (USFWS). Official Species List for project area. <http://ecos.fws.gov/ipac/>, accessed October 23, 2018.

Attachment 3

TXNDD Element of Occurrence (EO) Map



	Project Location		Golden-cheeked Warbler
	1.5-mile Project Location Buffer		Hairy Sycamore-leaf Snowbell
	Big Red Sage		Rookery
	Black Bear		Texas Salamander
	Bracted Twistflower		Western Hog-nosed Skunk
	Cascade Caverns Salamander		

TXNDD
Elements of Occurrence
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Note: only elements of occurrence intersecting the 1.5-mile buffer are illustrated on this map

0 1.5 Mile
 0 1.5 Kilometers

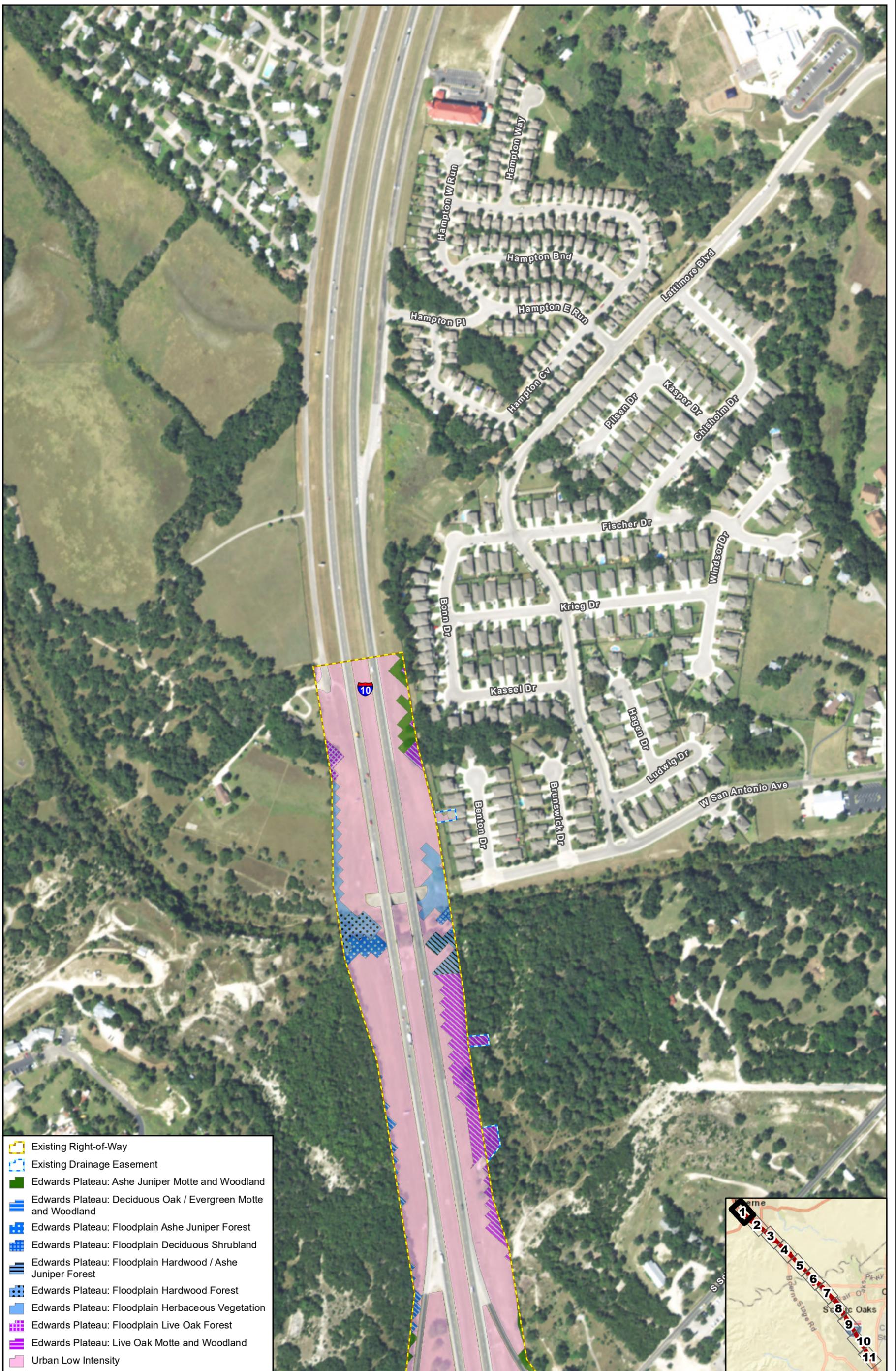
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 Scale: 1:95,040
 Date: 9/10/2018

CSJs: 0072-06-082 & 0072-07-075

Data Source: TPWD (6/14/2018)
 Basemap Source: ESRI (2018)

Attachment 4

EMST Vegetation Map
EMST Report



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Floodplain Ashe Juniper Forest
-  Edwards Plateau: Floodplain Deciduous Shrubland
-  Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest
-  Edwards Plateau: Floodplain Hardwood Forest
-  Edwards Plateau: Floodplain Herbaceous Vegetation
-  Edwards Plateau: Floodplain Live Oak Forest
-  Edwards Plateau: Live Oak Motte and Woodland
-  Urban Low Intensity

EMST Mapped Vegetation Types

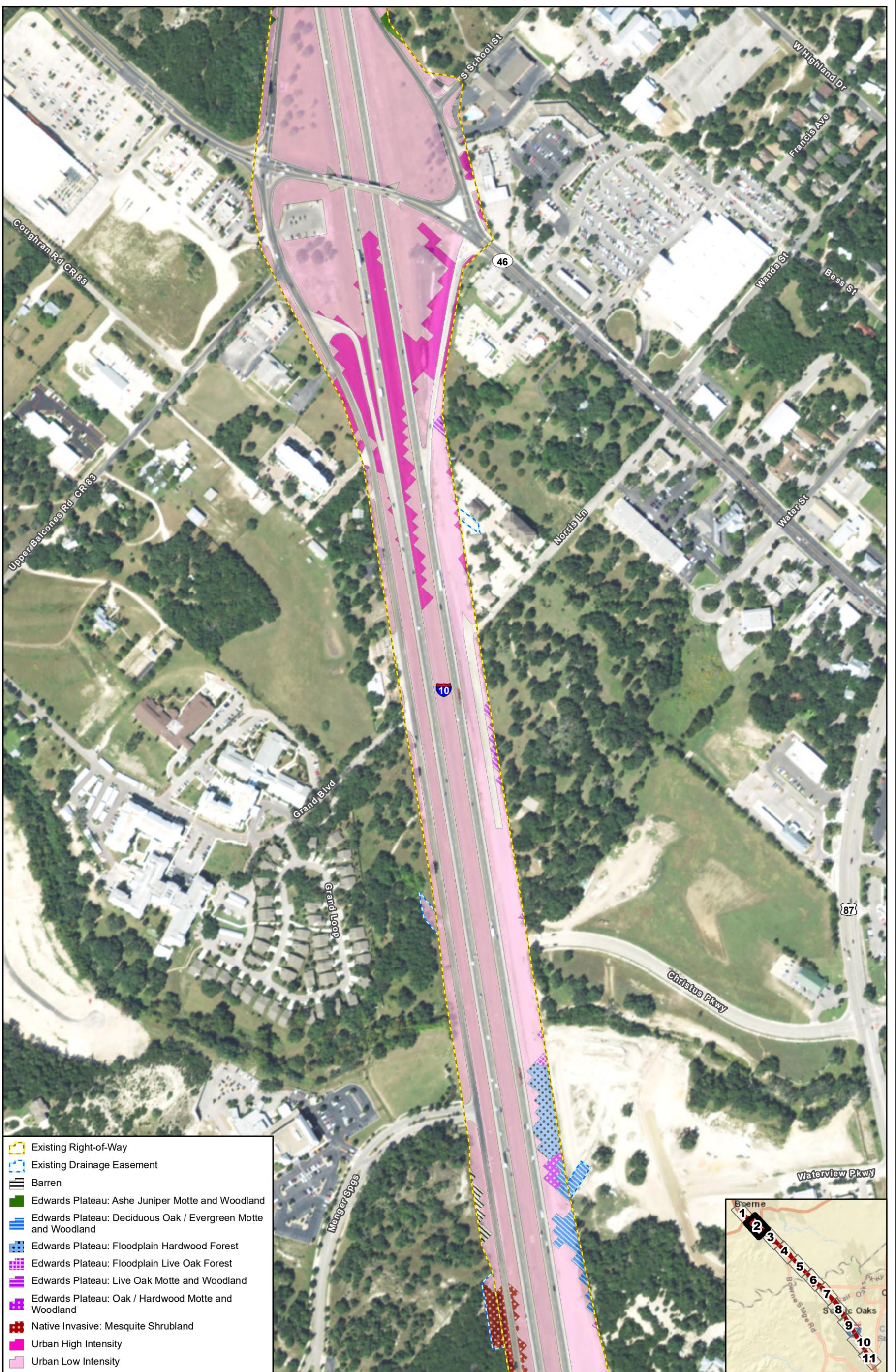
Sheet 1 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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Data Source: TxDOT/TPWD EMST/MoRAP (2013)
Aerial Source: NAIP (2016)

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Prepared for: TxDOT	Date: 9/10/2018	
CSJs: 0072-06-082 & 0072-07-075		



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Barren
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Floodplain Hardwood Forest
-  Edwards Plateau: Floodplain Live Oak Forest
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Oak / Hardwood Motte and Woodland
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity

EMST Mapped Vegetation Types

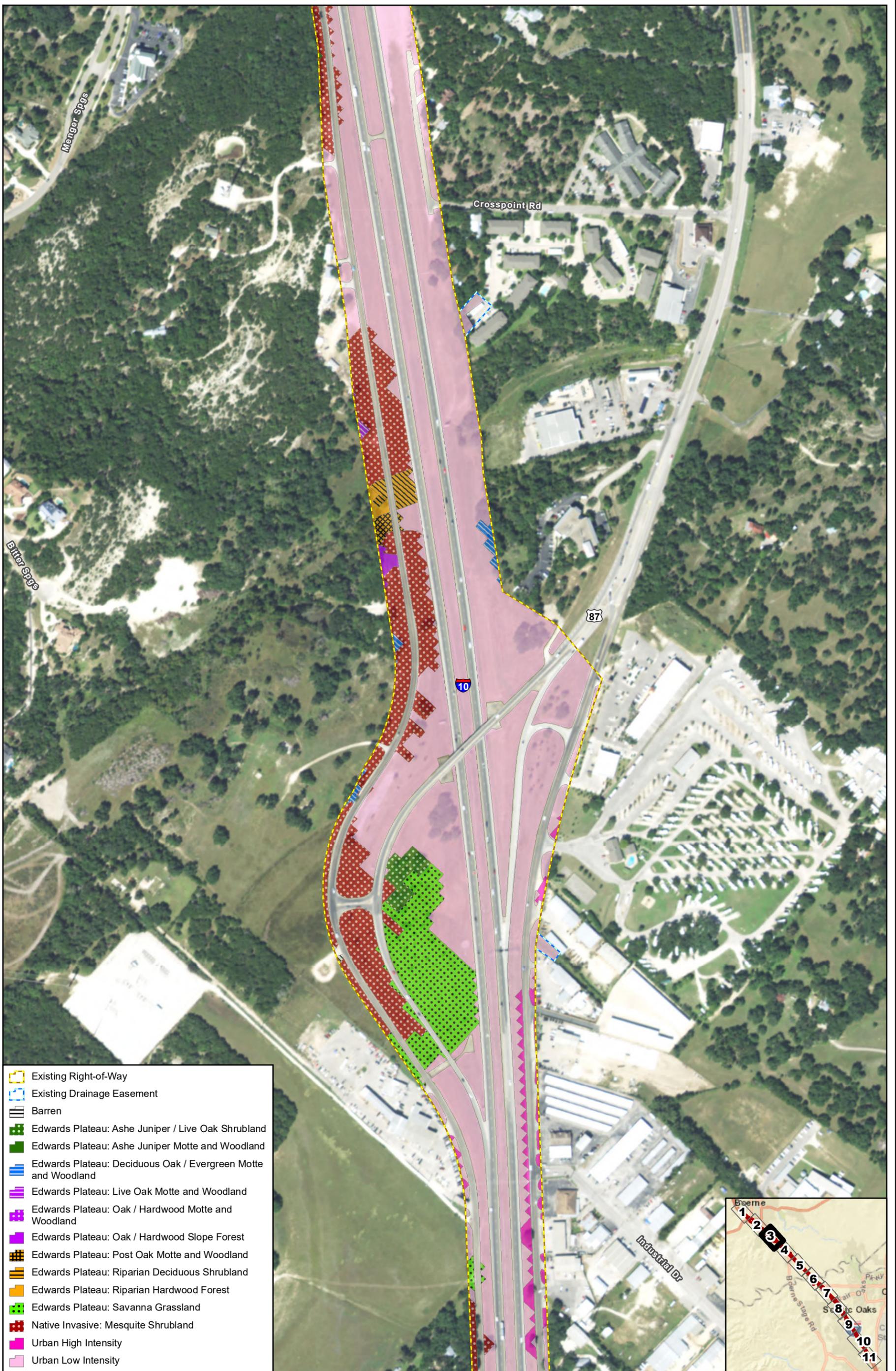
Sheet 2 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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Prepared for: TxDOT	Date: 9/10/2018	
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Data Source: TxDOT/TPWD EMST/MoRAP (2013)
Aerial Source: NAIP (2016)



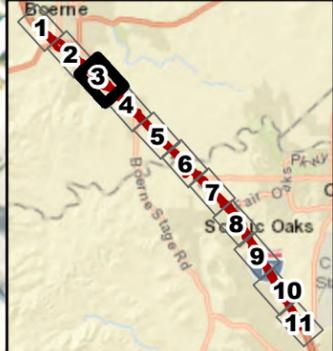
-  Existing Right-of-Way
-  Existing Drainage Easement
-  Barren
-  Edwards Plateau: Ashe Juniper / Live Oak Shrubland
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Oak / Hardwood Motte and Woodland
-  Edwards Plateau: Oak / Hardwood Slope Forest
-  Edwards Plateau: Post Oak Motte and Woodland
-  Edwards Plateau: Riparian Deciduous Shrubland
-  Edwards Plateau: Riparian Hardwood Forest
-  Edwards Plateau: Savanna Grassland
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity

EMST Mapped Vegetation Types

Sheet 3 of 11

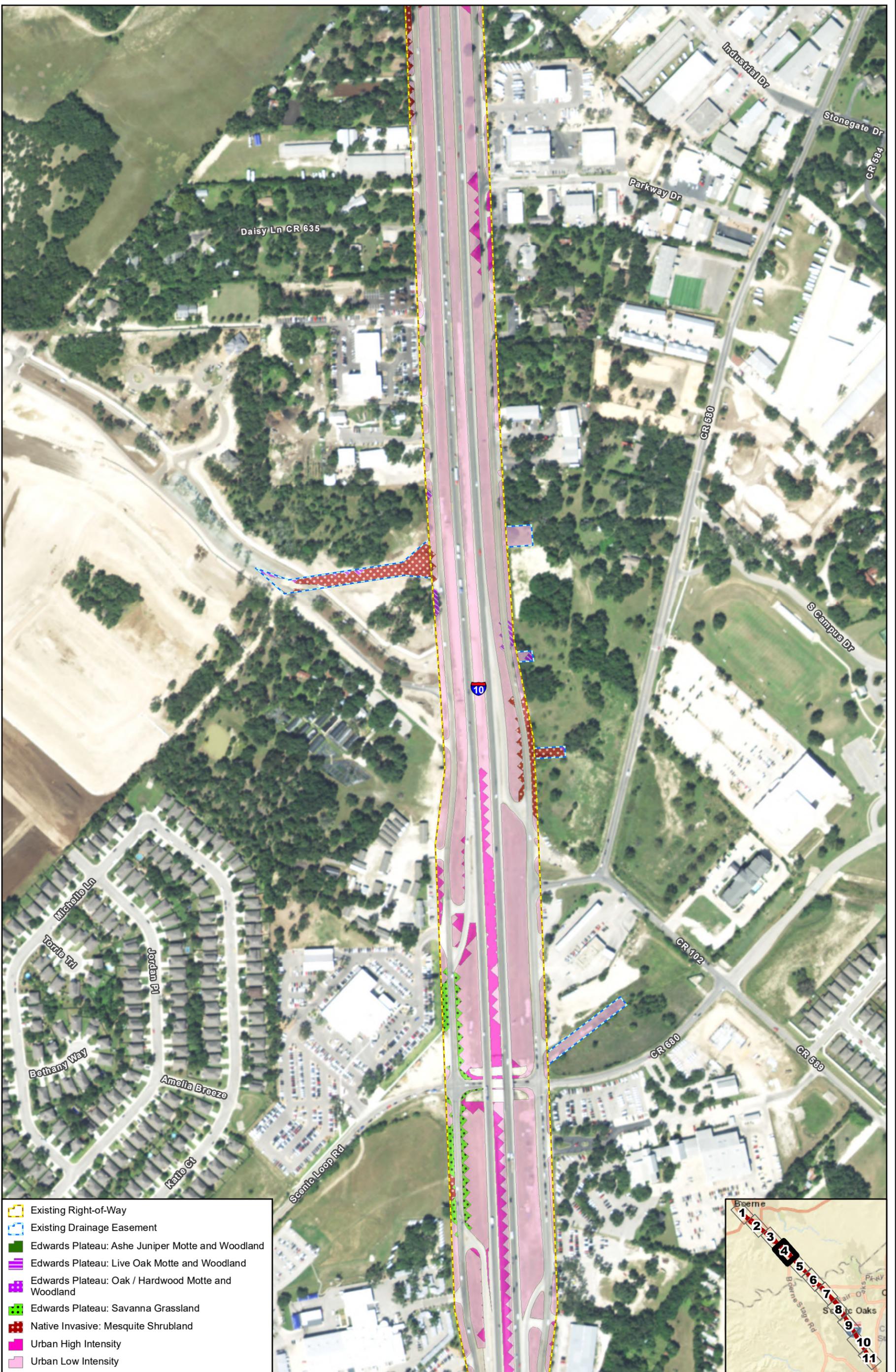
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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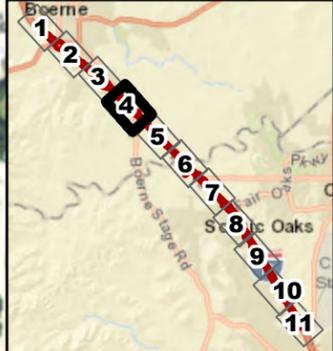


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Prepared for: TxDOT	Date: 9/10/2018	
CSJs: 0072-06-082 & 0072-07-075	Aerial Source: NAIP (2016)	

Data Source: TxDOT/TPWD EMST/MoRAP (2013)
Aerial Source: NAIP (2016)



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Oak / Hardwood Motte and Woodland
-  Edwards Plateau: Savanna Grassland
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity



EMST Mapped Vegetation Types

Sheet 4 of 11

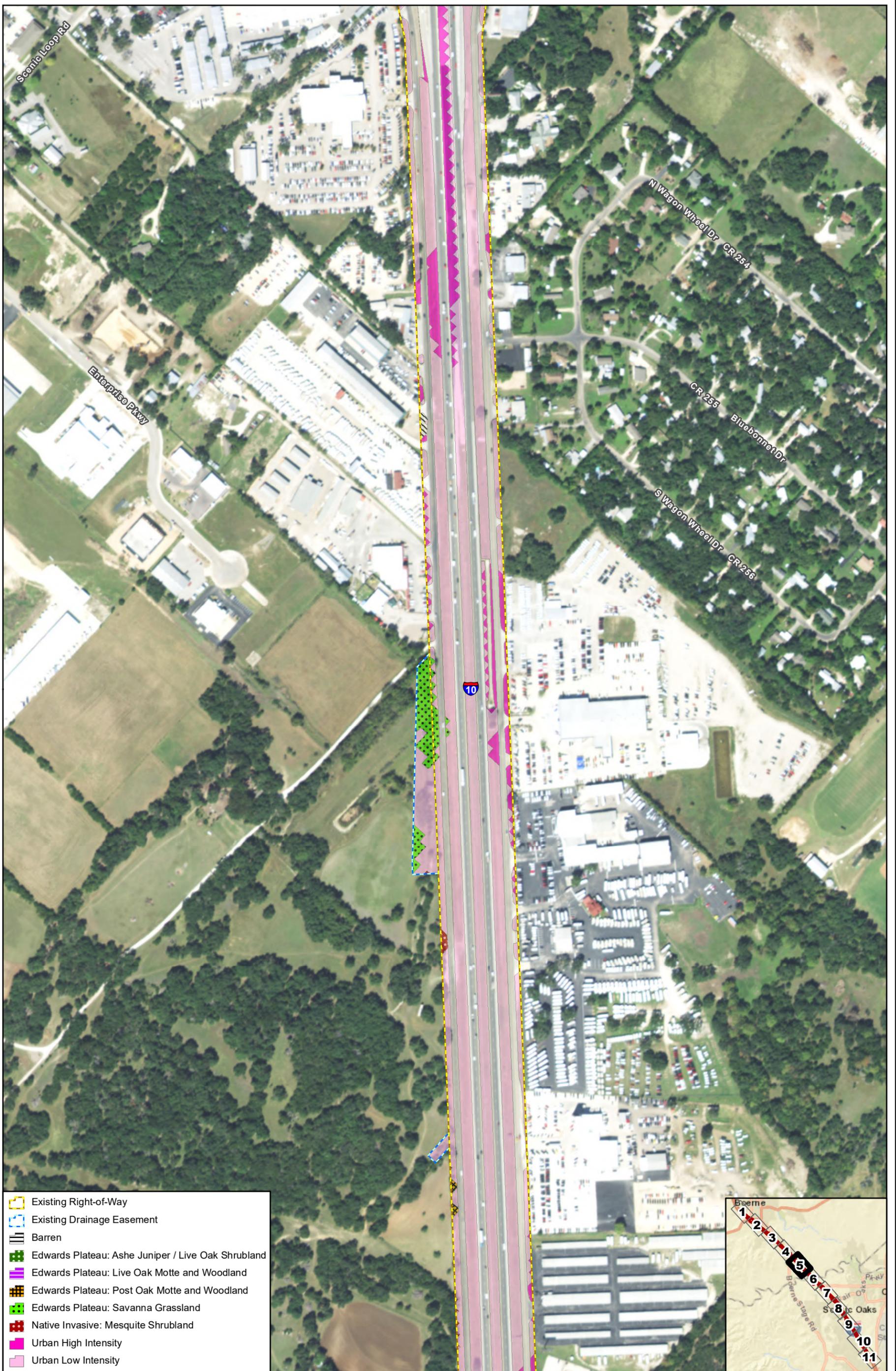
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Aerial Source: NAIP (2016)

CSJs: 0072-06-082 & 0072-07-075



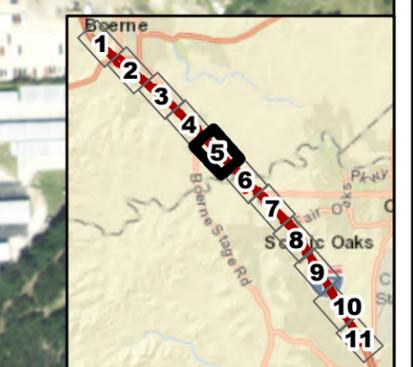
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-  Existing Drainage Easement
-  Barren
-  Edwards Plateau: Ashe Juniper / Live Oak Shrubland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Post Oak Motte and Woodland
-  Edwards Plateau: Savanna Grassland
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity

EMST Mapped Vegetation Types

Sheet 5 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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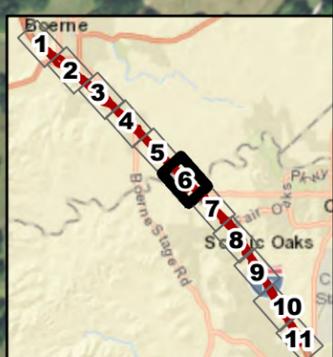
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 Scale: 1:4,200
 Date: 9/10/2018



Kendall County
Bexar County

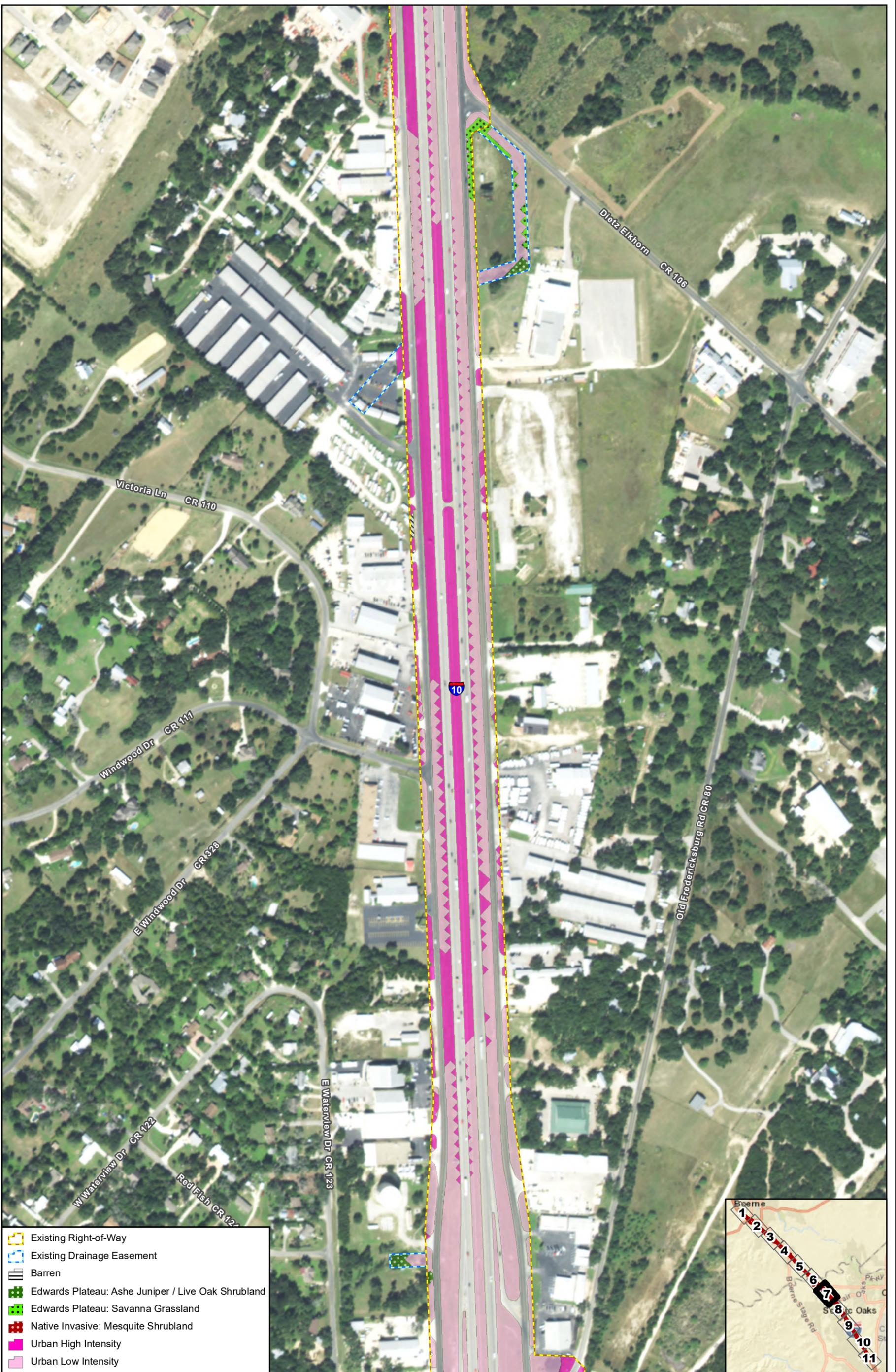
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- Existing Right-of-Way
- Existing Drainage Easement
- Barren
- Edwards Plateau: Ashe Juniper / Live Oak Shrubland
- Edwards Plateau: Ashe Juniper Motte and Woodland
- Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
- Edwards Plateau: Floodplain Ashe Juniper Forest
- Edwards Plateau: Floodplain Ashe Juniper Shrubland
- Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest
- Edwards Plateau: Floodplain Hardwood Forest
- Edwards Plateau: Live Oak Motte and Woodland
- Edwards Plateau: Oak / Hardwood Motte and Woodland
- Edwards Plateau: Post Oak Motte and Woodland
- Edwards Plateau: Riparian Deciduous Shrubland
- Edwards Plateau: Riparian Herbaceous Vegetation
- Edwards Plateau: Savanna Grassland
- Native Invasive: Mesquite Shrubland
- Urban High Intensity
- Urban Low Intensity

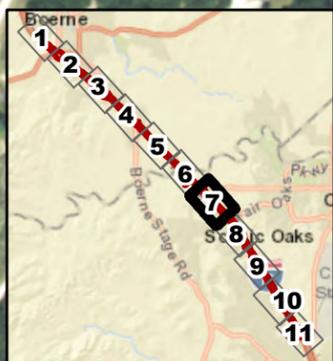


EMST Mapped Vegetation Types
Sheet 6 of 11
 I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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	0 120 Meters	Scale: 1:4,200
Prepared for: TxDOT	CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Barren
-  Edwards Plateau: Ashe Juniper / Live Oak Shrubland
-  Edwards Plateau: Savanna Grassland
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity



EMST Mapped Vegetation Types

Sheet 7 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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Prepared for: TxDOT	Date: 9/10/2018	
CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018	

Data Source: TxDOT/TPWD EMST/MoRAP (2013)
Aerial Source: NAIP (2016)



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Barren
-  Edwards Plateau: Ashe Juniper / Live Oak Shrubland
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Oak / Hardwood Motte and Woodland
-  Edwards Plateau: Savanna Grassland
-  Edwards Plateau: Shin Oak Shrubland
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity

EMST Mapped Vegetation Types

Sheet 8 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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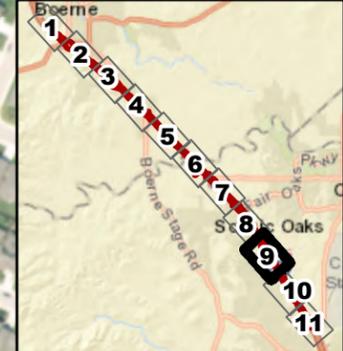


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	Date: 9/10/2018	

Data Source: TxDOT/TPWD EMST/MoRAP (2013)
Aerial Source: NAIP (2016)



- Existing Right-of-Way
- Existing Drainage Easement
- Edwards Plateau: Ashe Juniper / Live Oak Shrubland
- Edwards Plateau: Ashe Juniper Motte and Woodland
- Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
- Edwards Plateau: Live Oak Motte and Woodland
- Edwards Plateau: Oak / Hardwood Motte and Woodland
- Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest
- Edwards Plateau: Riparian Herbaceous Vegetation
- Edwards Plateau: Riparian Live Oak Forest
- Edwards Plateau: Savanna Grassland
- Native Invasive: Mesquite Shrubland
- Urban High Intensity
- Urban Low Intensity



EMST Mapped Vegetation Types

Sheet 9 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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	0	120 Meters
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CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018	

Data Source: TxDOT/TPWD EMST/MoRAP (2013)
Aerial Source: NAIP (2016)



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Barren
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Post Oak Motte and Woodland
-  Edwards Plateau: Riparian Hardwood Forest
-  Edwards Plateau: Riparian Herbaceous Vegetation
-  Edwards Plateau: Savanna Grassland
-  Native Invasive: Mesquite Shrubland
-  Row Crops
-  Urban High Intensity
-  Urban Low Intensity

EMST Mapped Vegetation Types

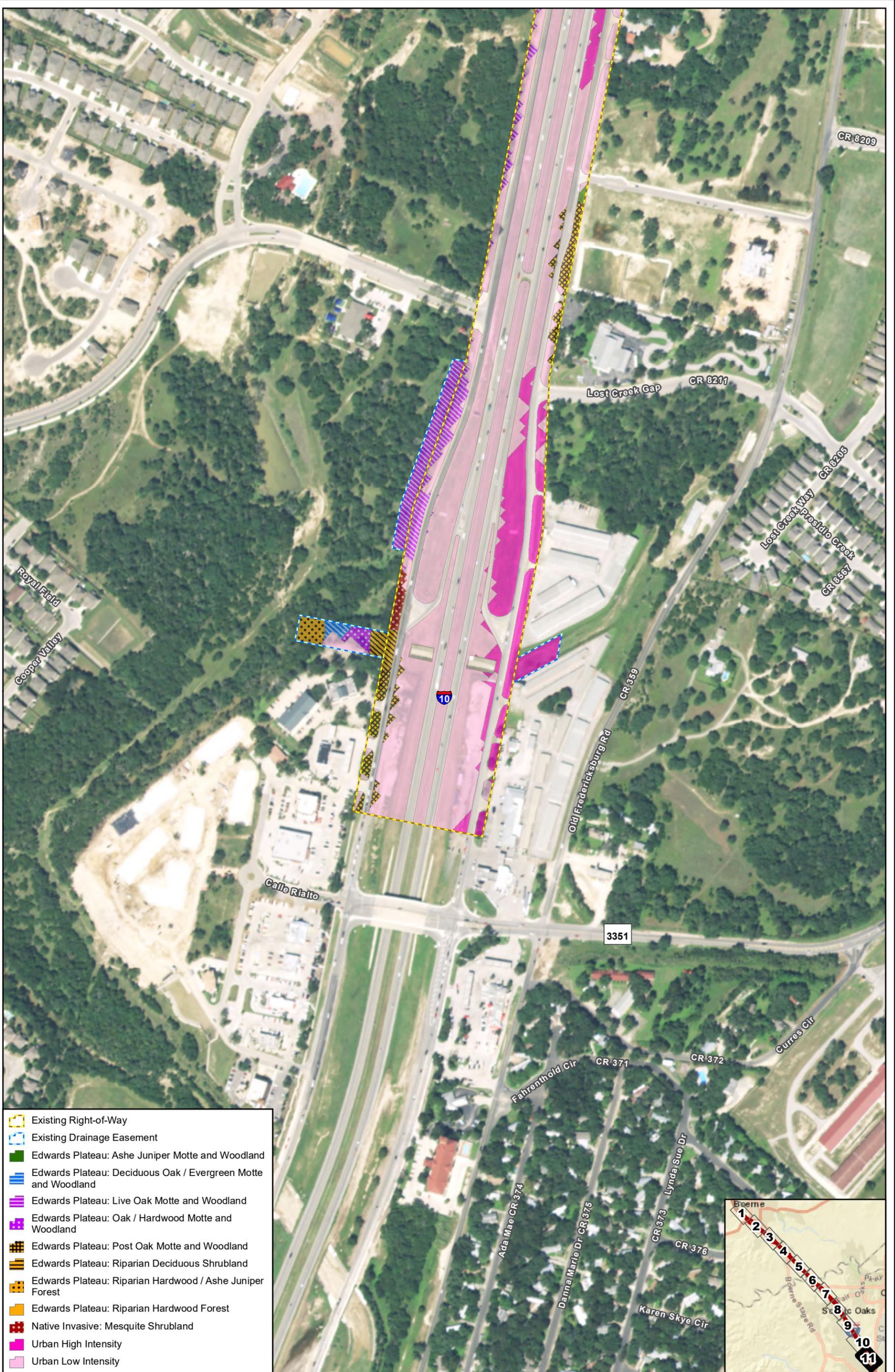
Sheet 10 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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Aerial Source: NAIP (2016)

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Prepared for: TxDOT	Date: 9/10/2018	
CSJs: 0072-06-082 & 0072-07-075		



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Ashe Juniper Motte and Woodland
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Oak / Hardwood Motte and Woodland
-  Edwards Plateau: Post Oak Motte and Woodland
-  Edwards Plateau: Riparian Deciduous Shrubland
-  Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest
-  Edwards Plateau: Riparian Hardwood Forest
-  Native Invasive: Mesquite Shrubland
-  Urban High Intensity
-  Urban Low Intensity

EMST Mapped Vegetation Types

Sheet 11 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\I10_SH46_to_FM3351\BEF_EMST_20180910.mxd

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Prepared for: TxDOT	Date: 9/10/2018	
Data Source: TxDOT/TPWD EMST/MoRAP (2013)	CSJs: 0072-06-082 & 0072-07-075	
Aerial Source: NAIP (2016)		

Project EMST Vegetation Types

MOU Habitat	Ecosystem Name	Common Name	acres
Agriculture			
	Agriculture		
		Row Crops	0.07
	Barren		
		Barren	0.773
MOU Habitat Sum acres			0.843
Disturbed Prairie			
	Native Invasive Shrub and Woodland		
		Native Invasive: Mesquite Shrubland	13.766
MOU Habitat Sum acres			13.766
Edwards Plateau Savannah, Woodland, and Shrubland			
	Edwards Plateau Dry-Mesic Slope Forest and Woodland		
		Edwards Plateau: Oak / Hardwood Slope Forest	0.129
	Edwards Plateau Limestone Savanna and Woodland		
		Edwards Plateau: Ashe Juniper Motte and Woodland	0.93
		Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland	2.309
		Edwards Plateau: Live Oak Motte and Woodland	6.641
		Edwards Plateau: Oak / Hardwood Motte and Woodland	0.534
		Edwards Plateau: Post Oak Motte and Woodland	1.606
		Edwards Plateau: Savanna Grassland	13.695
	Edwards Plateau Limestone Shrubland		
		Edwards Plateau: Ashe Juniper / Live Oak Shrubland	3.455
		Edwards Plateau: Shin Oak Shrubland	0.058
MOU Habitat Sum acres			29.358

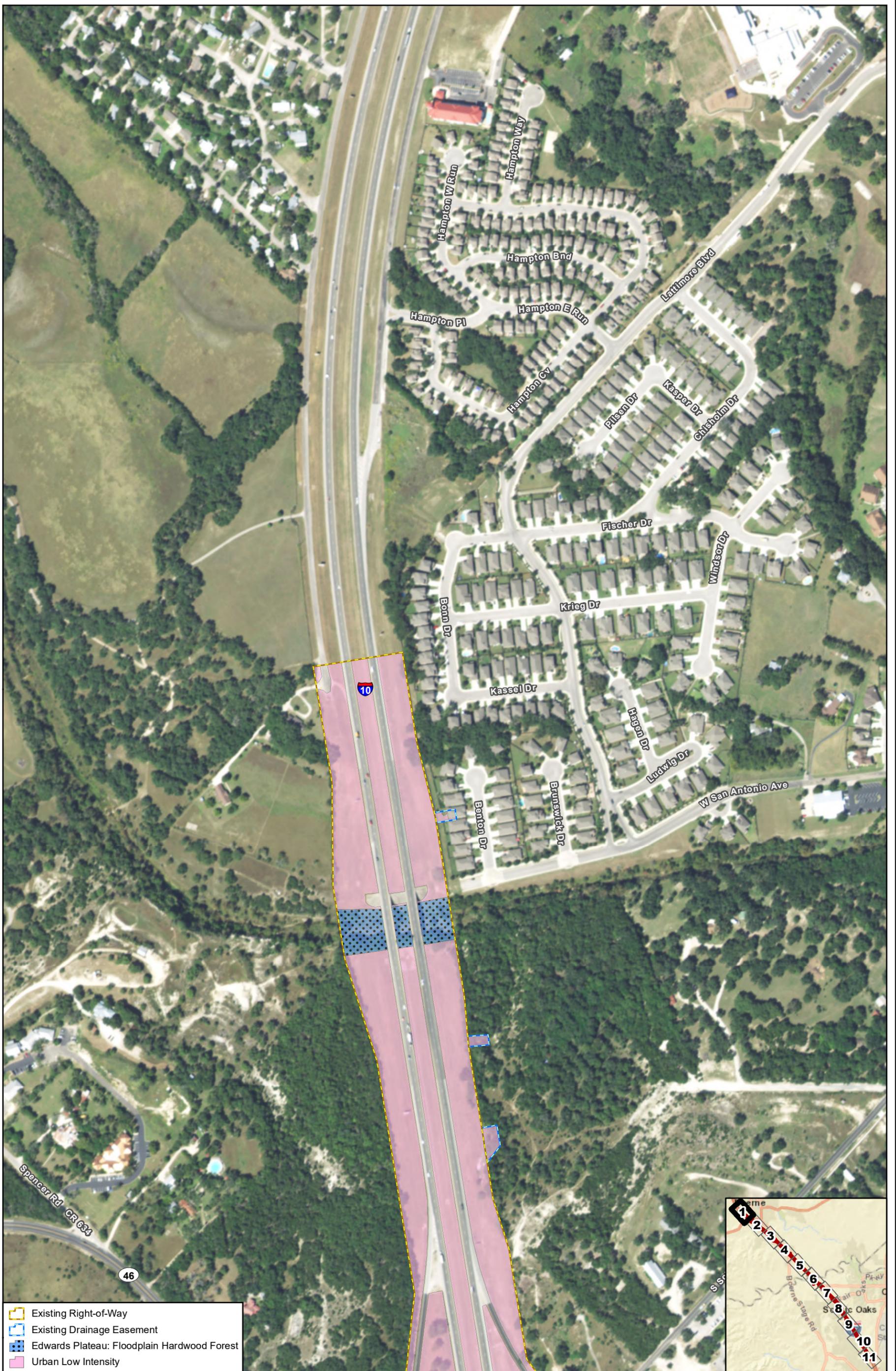
Riparian

Edwards Plateau Floodplain

MOU Habitat	Ecosystem Name	Common Name	acres
		Edwards Plateau: Floodplain Ashe Juniper Forest	0.272
		Edwards Plateau: Floodplain Ashe Juniper Shrubland	0.005
		Edwards Plateau: Floodplain Deciduous Shrubland	0.071
		Edwards Plateau: Floodplain Hardwood / Ashe Juniper Forest	0.606
		Edwards Plateau: Floodplain Hardwood Forest	1.047
		Edwards Plateau: Floodplain Herbaceous Vegetation	0.767
		Edwards Plateau: Floodplain Live Oak Forest	0.166
	Edwards Plateau Riparian		
		Edwards Plateau: Riparian Deciduous Shrubland	1.129
		Edwards Plateau: Riparian Hardwood / Ashe Juniper Forest	0.608
		Edwards Plateau: Riparian Hardwood Forest	0.808
		Edwards Plateau: Riparian Herbaceous Vegetation	1.472
		Edwards Plateau: Riparian Live Oak Forest	0.438
MOU Habitat Sum acres			7.387
Urban			
	Urban		
		Urban High Intensity	33.742
		Urban Low Intensity	218.035
MOU Habitat Sum acres			251.778
Sum acres			303.131

Attachment 5

Observed Vegetation Map
Observed EMST Vegetation Table



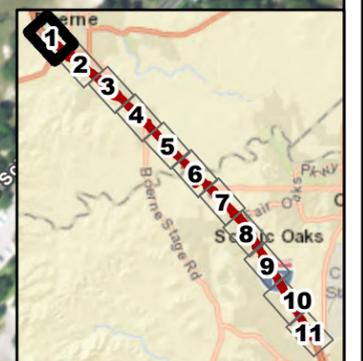
- Existing Right-of-Way
- Existing Drainage Easement
- Edwards Plateau: Floodplain Hardwood Forest
- Urban Low Intensity

Observed Vegetation Types

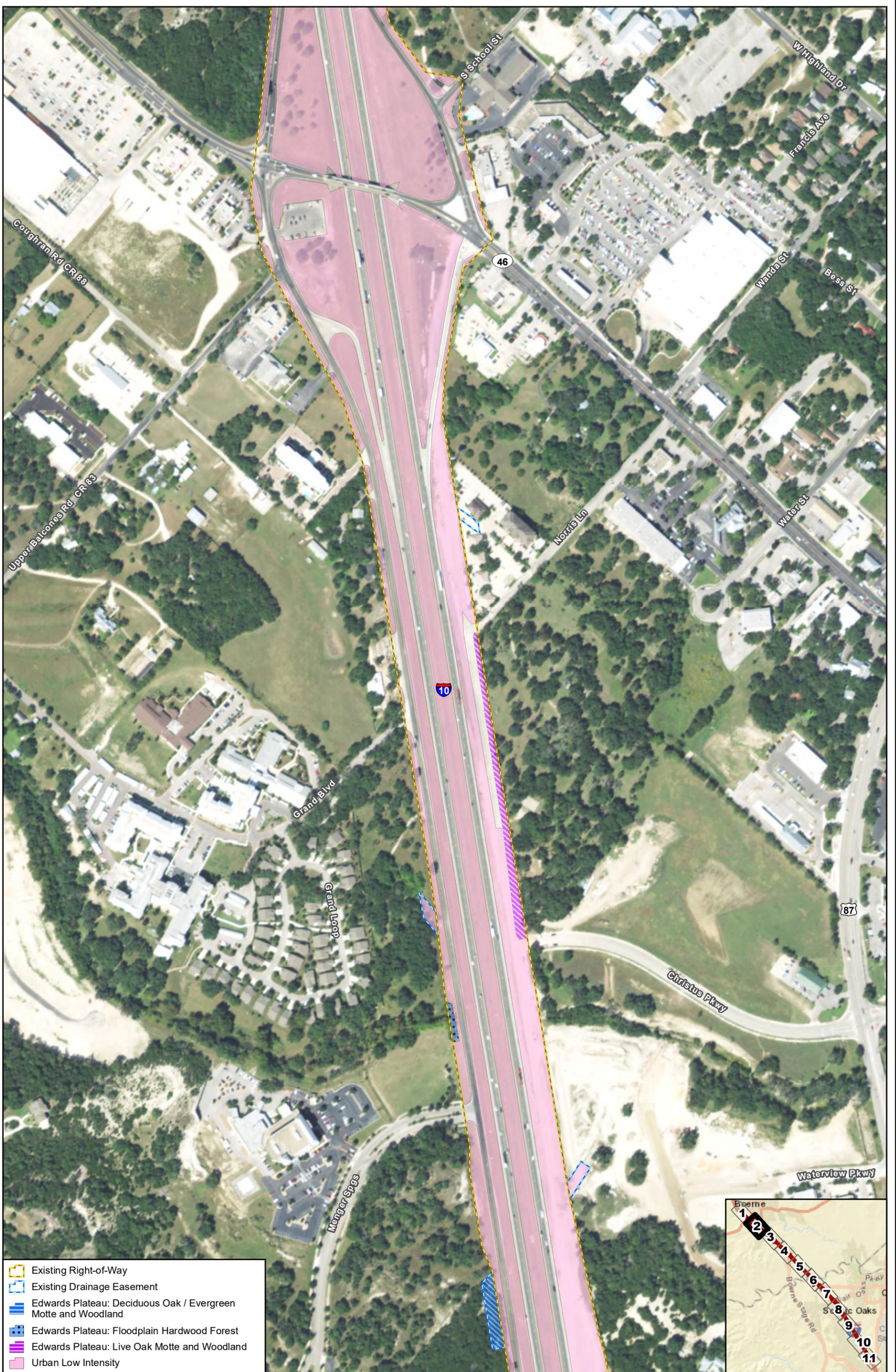
Sheet 1 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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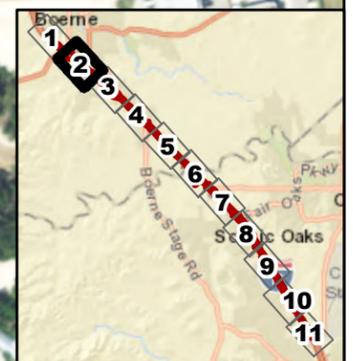
-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Floodplain Hardwood Forest
-  Edwards Plateau: Live Oak Motte and Woodland
-  Urban Low Intensity

Observed Vegetation Types

Sheet 2 of 11

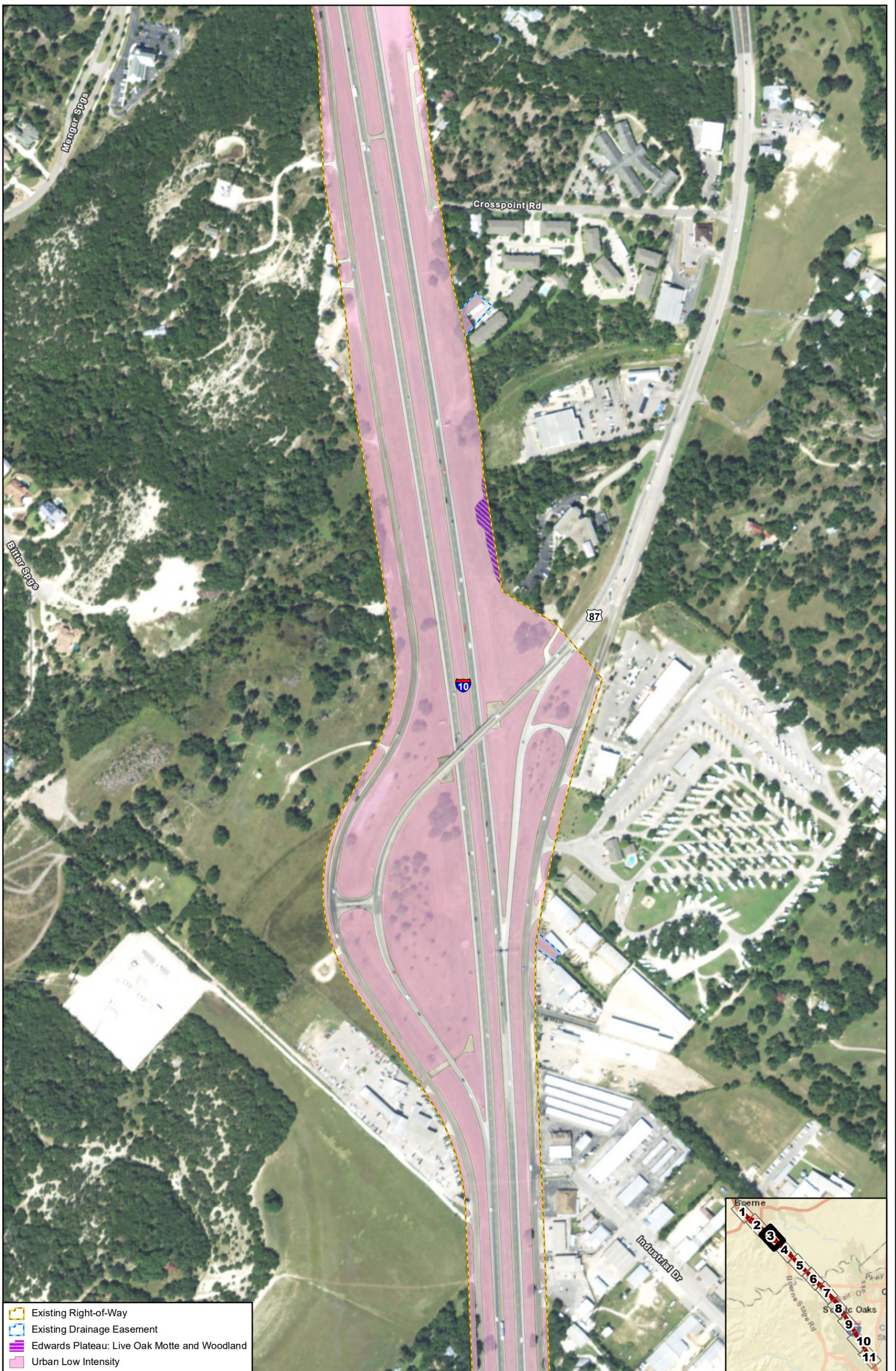
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018	

Data Source: CMEC (2018)
Aerial Source: NAIP (2016)



- Existing Right-of-Way
- Existing Drainage Easement
- Edwards Plateau: Live Oak Motte and Woodland
- Urban Low Intensity

Observed Vegetation Types

Sheet 3 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\IH10_SH46 to FM3351\BEF_Observed Vegetation_20180910.mxd



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		CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018

Data Source: CMEC (2018)
Aerial Source: NAIP (2016)



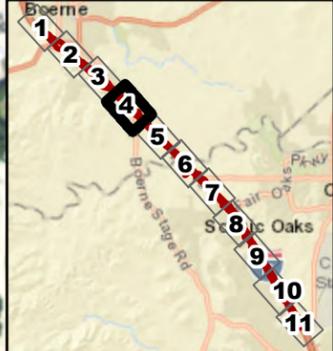
- Existing Right-of-Way
- Existing Drainage Easement
- Edwards Plateau: Ashe Juniper / Live Oak Shrubland
- Urban Low Intensity

Observed Vegetation Types

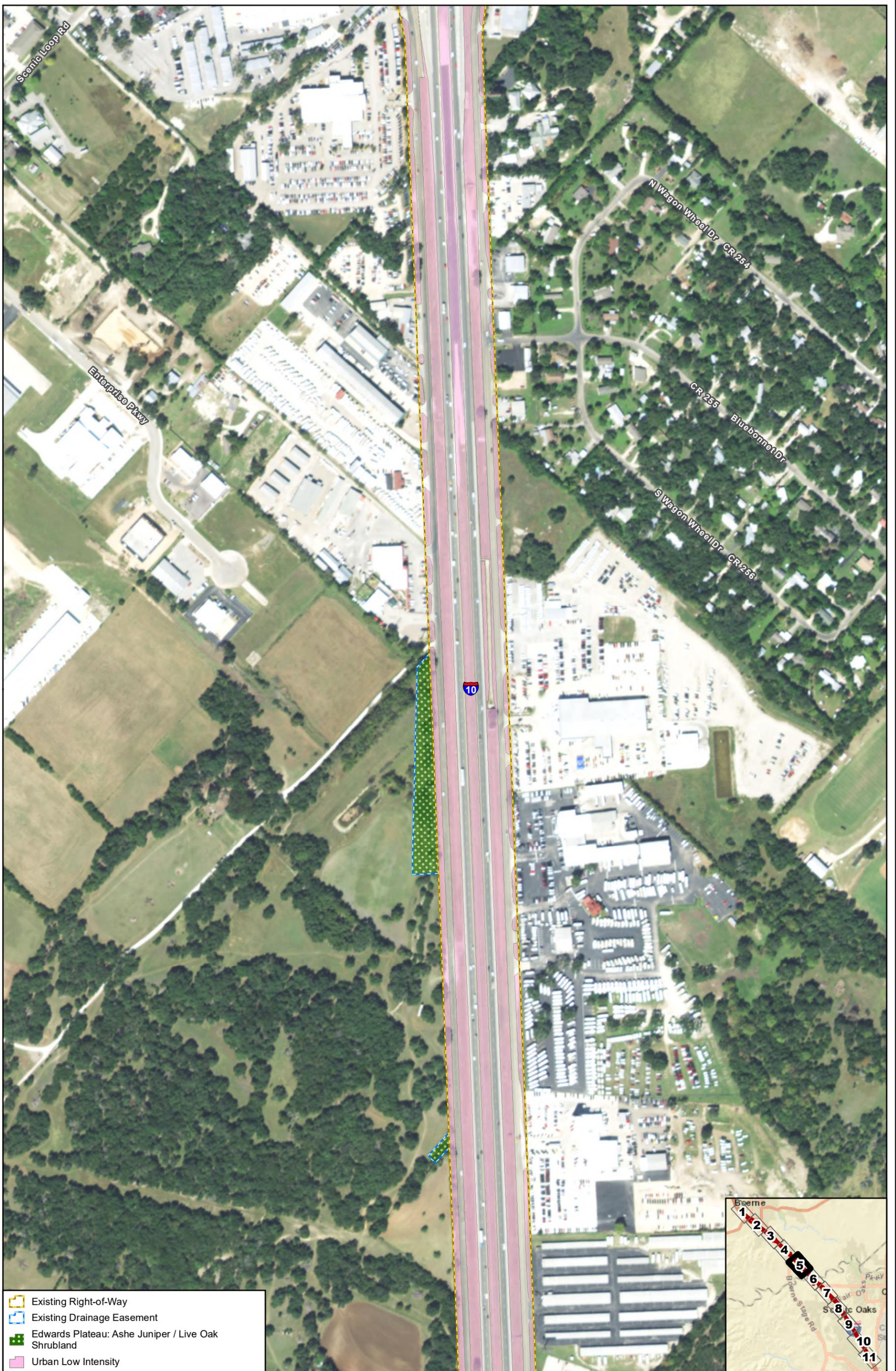
Sheet 4 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

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Aerial Source: NAIP (2016)	Date: 9/10/2018
CSJs: 0072-06-082 & 0072-07-075	

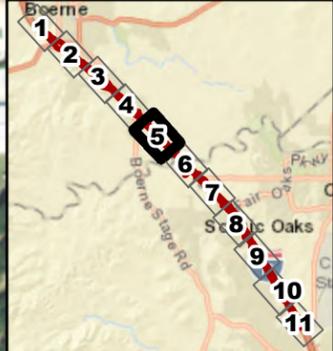


-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Ashe Juniper / Live Oak Shrubland
-  Urban Low Intensity

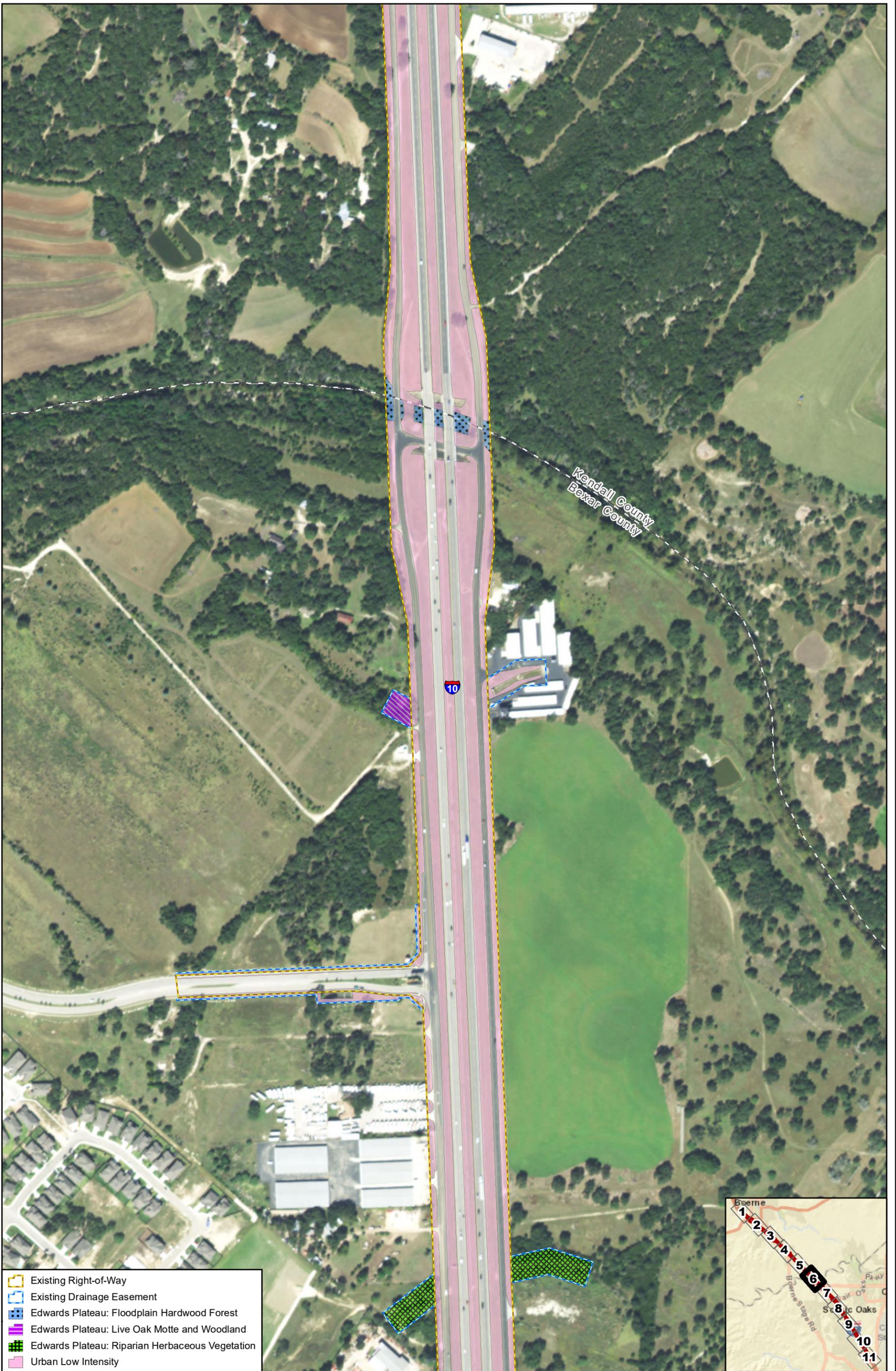
Observed Vegetation Types

Sheet 5 of 11

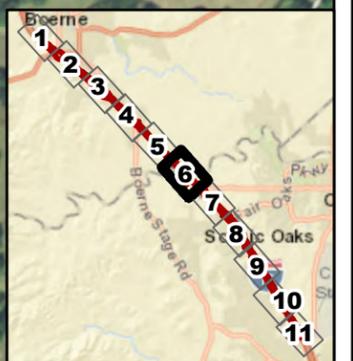
I-10 from SH 46 to Ralph Fair Rd (FM 3351)



	0	350 Feet
	0	120 Meters
Prepared for: TxDOT	1 in = 350 feet	
Date: 9/10/2018	Scale: 1:4,200	



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Floodplain Hardwood Forest
-  Edwards Plateau: Live Oak Motte and Woodland
-  Edwards Plateau: Riparian Herbaceous Vegetation
-  Urban Low Intensity

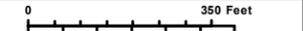


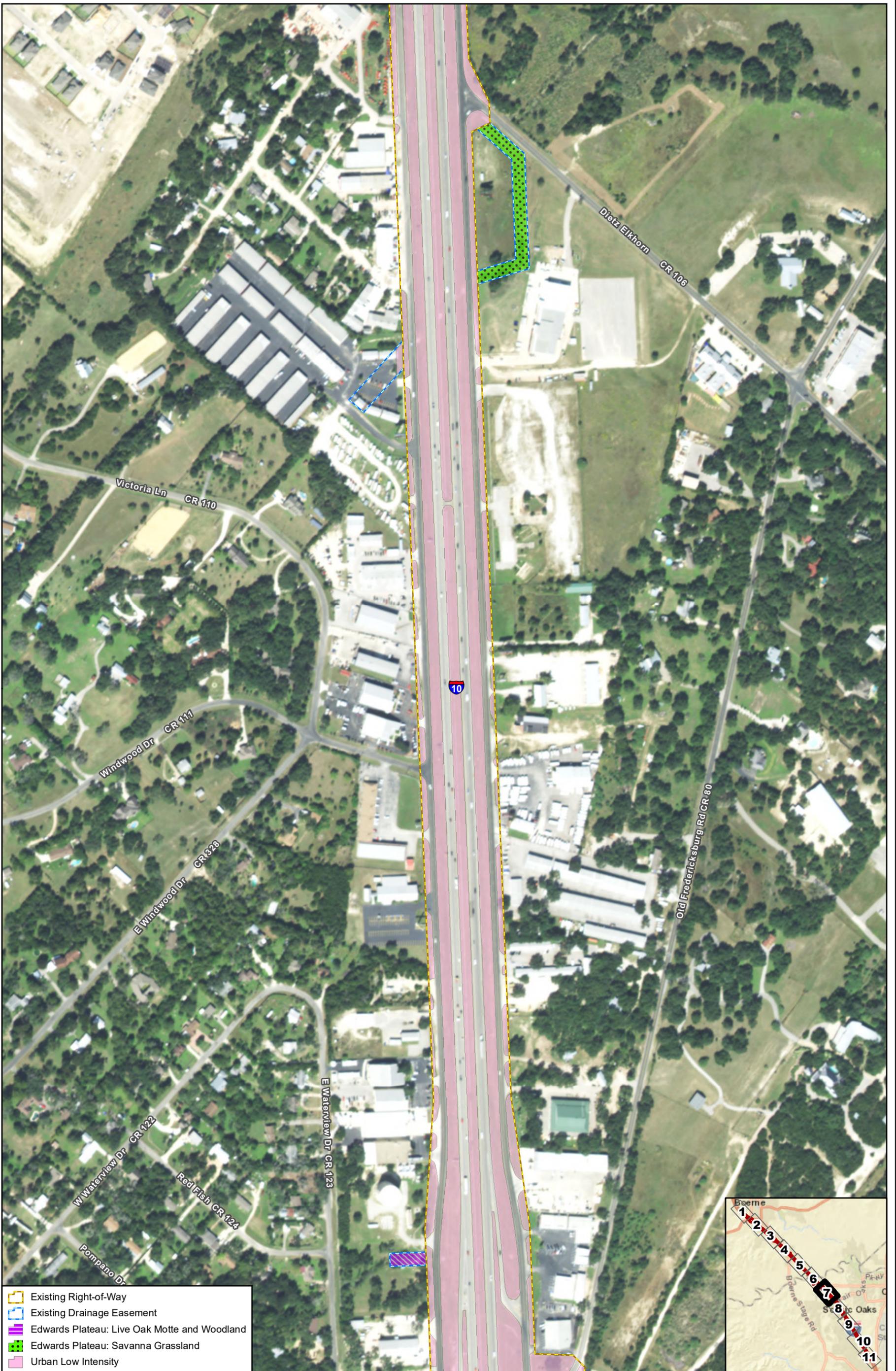
Observed Vegetation Types

Sheet 6 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\I10_SH46 to FM3351\BEF_Observed Vegetation_20180910.mxd

	 							
	<table border="0" style="width: 100%;"> <tr> <td style="font-size: small;">Prepared for: TxDOT</td> <td style="font-size: small;">1 in = 350 feet</td> </tr> <tr> <td style="font-size: x-small;">Data Source: CMEC (2018)</td> <td style="font-size: x-small;">Scale: 1:4,200</td> </tr> <tr> <td style="font-size: x-small;">Aerial Source: NAIP (2016)</td> <td style="font-size: x-small;">Date: 9/10/2018</td> </tr> <tr> <td style="font-size: x-small;">CSJs: 0072-06-082 & 0072-07-075</td> <td></td> </tr> </table>	Prepared for: TxDOT	1 in = 350 feet	Data Source: CMEC (2018)	Scale: 1:4,200	Aerial Source: NAIP (2016)	Date: 9/10/2018	CSJs: 0072-06-082 & 0072-07-075
Prepared for: TxDOT	1 in = 350 feet							
Data Source: CMEC (2018)	Scale: 1:4,200							
Aerial Source: NAIP (2016)	Date: 9/10/2018							
CSJs: 0072-06-082 & 0072-07-075								



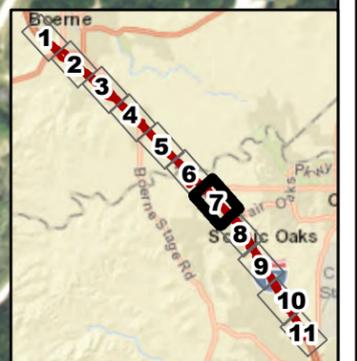
- Existing Right-of-Way
- Existing Drainage Easement
- Edwards Plateau: Live Oak Motte and Woodland
- Edwards Plateau: Savanna Grassland
- Urban Low Intensity

Observed Vegetation Types

Sheet 7 of 11

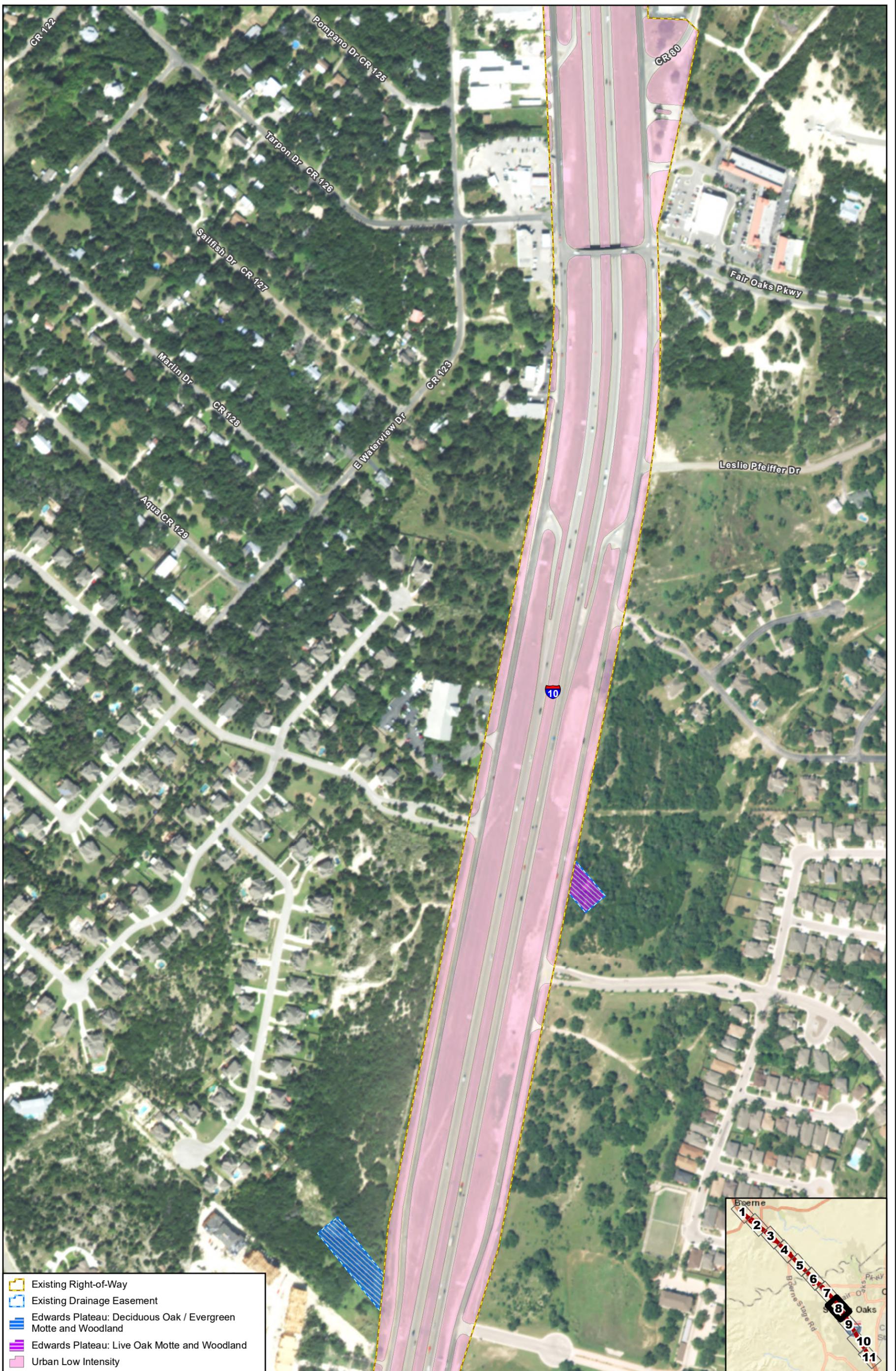
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\I10_SH46 to FM3351\BEF_Observed Vegetation_20180910.mxd

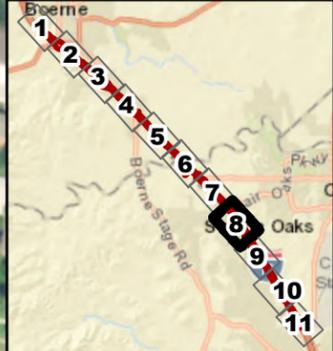


 	350 Feet
	120 Meters
Prepared for: TxDOT	Scale: 1:4,200
CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018

Data Source: CMEC (2018)
Aerial Source: NAIP (2016)



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Live Oak Motte and Woodland
-  Urban Low Intensity



Observed Vegetation Types

Sheet 8 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\I10_SH46 to FM3351\BEF_Observed Vegetation_20180910.mxd

	0 350 Feet	1 in = 350 feet
	0 120 Meters	Scale: 1:4,200
Prepared for: TxDOT	Date: 9/10/2018	
Data Source: CMEC (2018)	CSJs: 0072-06-082 & 0072-07-075	
Aerial Source: NAIP (2016)		



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland
-  Edwards Plateau: Floodplain Hardwood Forest
-  Edwards Plateau: Live Oak Motte and Woodland
-  Native Invasive: Mesquite Shrubland
-  Urban Low Intensity

Observed Vegetation Types

Sheet 9 of 11

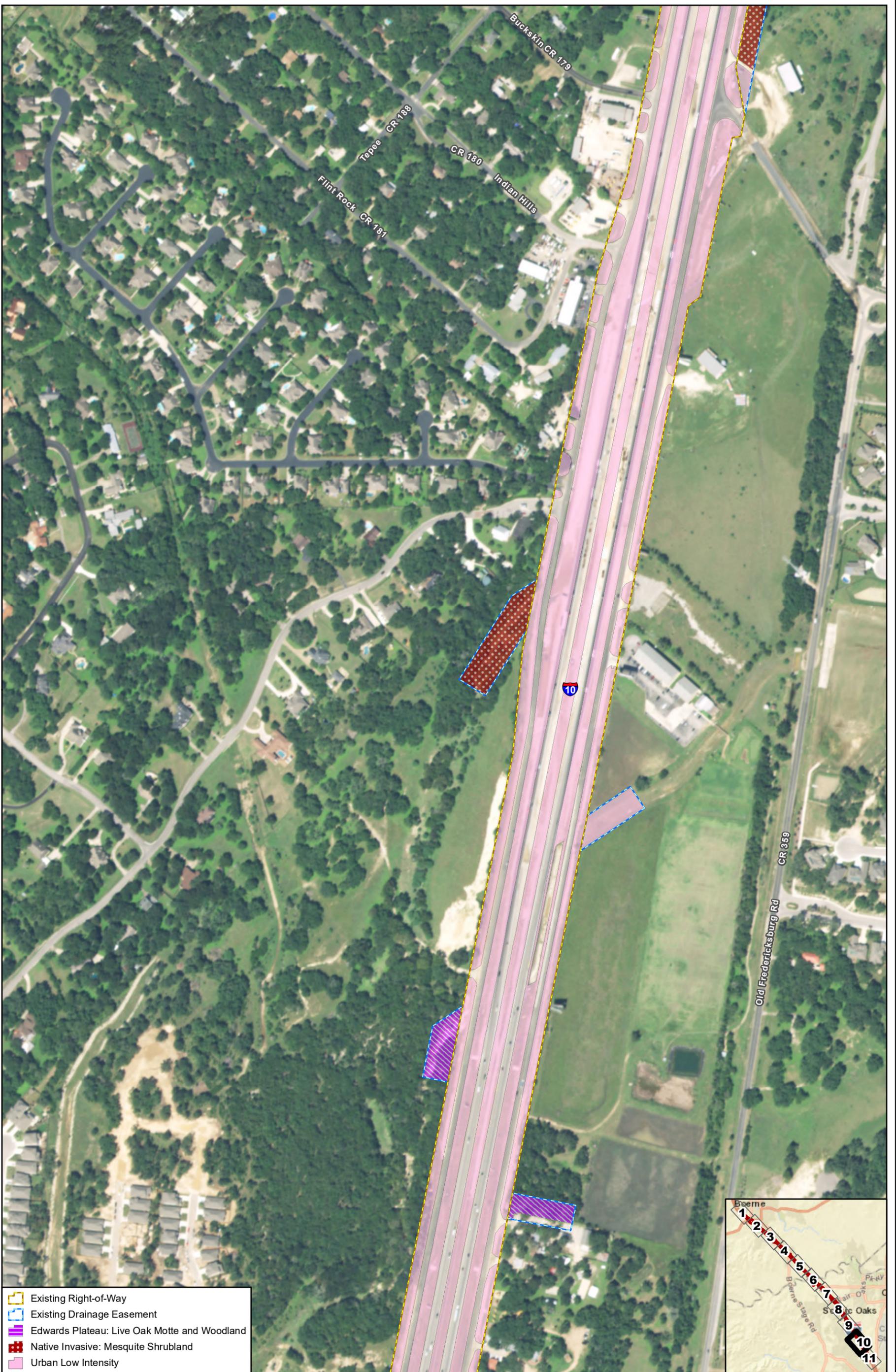
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\I10_SH46 to FM3351\BEF_Observed Vegetation_20180910.mxd



	0 350 Feet	1 in = 350 feet
	0 120 Meters	Scale: 1:4,200
Prepared for: TxDOT	CSJs: 0072-06-082 & 0072-07-075	Date: 9/10/2018

Data Source: CMEC (2018)
Aerial Source: NAIP (2016)



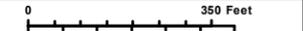
-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Live Oak Motte and Woodland
-  Native Invasive: Mesquite Shrubland
-  Urban Low Intensity

Observed Vegetation Types

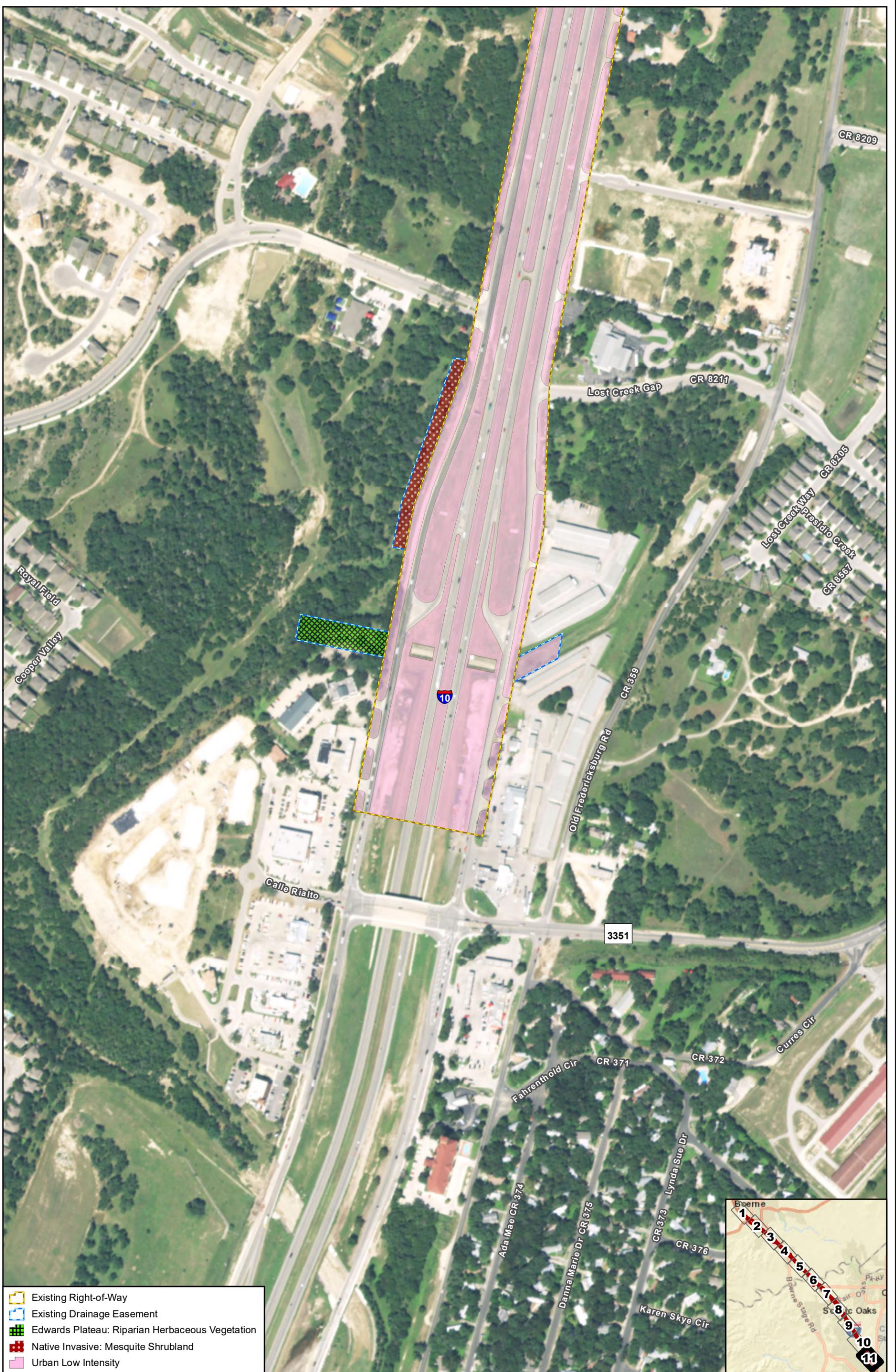
Sheet 10 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\IH10_SH46 to FM3351\BEF_Observed Vegetation_20180910.mxd

		Prepared for: TxDOT	1 in = 350 feet
		Data Source: CMEC (2018) Aerial Source: NAIP (2016)	Scale: 1:4,200 Date: 9/10/2018

CSJs: 0072-06-082 & 0072-07-075



-  Existing Right-of-Way
-  Existing Drainage Easement
-  Edwards Plateau: Riparian Herbaceous Vegetation
-  Native Invasive: Mesquite Shrubland
-  Urban Low Intensity

Observed Vegetation Types

Sheet 11 of 11

I-10 from SH 46 to Ralph Fair Rd (FM 3351)

G:\Projects\TXDOT\I10_SH46_to_FM3351\BEF_Observed_Vegetation_20180910.mxd



	0	350 Feet
	0	120 Meters
Prepared for: TxDOT	1 in = 350 feet	
Data Source: CMEC (2018)	Scale: 1:4,200	
Aerial Source: NAIP (2016)	Date: 9/10/2018	
CSJs: 0072-06-082 & 0072-07-075		

Observed EMST Vegetation within the Project Area

MOU Habitat Type	EMST Vegetation Type	Acreage of Impacts	Threshold Value	Threshold Exceeded?
Edwards Plateau Savanna, Woodland, and Shrubland	Edwards Plateau: Ashe Juniper/ Live Oak Shrubland	1.88	1.0	Yes
	Edwards Plateau: Live Oak Motte & Woodland	3.42		
	Edwards Plateau: Deciduous Oak Evergreen Motte & Woodland	1.50		
	Edwards Plateau: Savanna Grassland	0.89		
MOU Type Acreage Total:		7.69		
Riparian	Edwards Plateau: Riparian Herbaceous Vegetation	2.02	0.1	Yes
	Edwards Plateau: Floodplain Hardwood Forest	3.05		
	MOU Type Acreage Total:			
Disturbed Prairie	Non-native Invasive: Mesquite Shrubland	3.21	2.0	Yes
MOU Type Acreage Total:		3.21		
Urban	Urban Low Intensity	287.17	N/A	No
Total Acreage:		303.14		

Source: CMEC Field Team, 2018.

Attachment 6

Project Area Photographs



Photo 1: I-10 northwestern project terminus; facing east.



Photo 2: Frederick Creek crossing, maintained grasses in right-of-way (ROW), riparian vegetation along creek in background; facing east.



Photo 3: Inactive swallow nests under Frederick Creek bridge.



Photo 4: Frederick Creek under mainlanes of I-10; Riparian vegetation present; facing north and upstream.



Photo 5: Drainage easement with mowed and maintained urban vegetation adjacent to a subdivision; viewing north.



Photo 6: Typical mowed and maintained vegetation (Urban) within the I-10 ROW; viewing west.



Photo 7: Riparian vegetation within drainage easement, east of Menger Creek; viewing south.



Photo 8: Edwards Plateau: Ashe Juniper/ Live Oak Shrubland observed within a drainage easement adjacent to ROW; viewing south.



Photo 9: View of Menger Creek outside of the ROW; facing south.



Photo 10: Concrete lines unnamed blueline within project area after rain event; viewing south.



Photo 11: Typical mowed and maintained (Urban) vegetation within I-10 ROW; facing east.



Photo 12: Channelized drainage easement on north side of I-10 with herbaceous Riparian vegetation and rock gabions; viewing north.



Photo 13: Edwards Plateau: Ashe Juniper/ Live Oak Shrubland adjacent to I-10 ROW in a drainage easement; viewing west.



Photo 14: Balcones Creek conveyed below I-10 mainlanes; viewing north.



Photo 15: View of Balcones Creek (downstream) from frontage road; viewing south.



Photo 16: Dense fenceline vegetation (Edwards Plateau: Deciduous Oak Evergreen Motte & Woodland) encroaching into I-10 ROW; viewing south.



Photo 17: Non-native Invasive: Mesquite Shrubland located within an easement adjacent to I-10 ROW; viewing southeast.



Photo 18: Landscaped urban vegetation within the I-10 ROW; viewing west.



Photo 19: Edwards Plateau: Deciduous Oak Evergreen Motte & Woodland located adjacent and encroaching into the I-10 ROW; viewing north.



Photo 20: Edwards Plateau: Savanna Grassland within I-10 ROW; viewing northwest.



Photo 21: Active construction within the I-10 ROW; viewing east.



Photo 22: Edwards Plateau: Live Oak Motte & Woodland within I-10 ROW and adjacent easement; viewing west.



Photo 23: Southeastern project terminus along I-10; viewing west.