Golden-cheeked Warbler (*Setophaga* [=*Dendroica*] *chrysoparia*) - Effect Determination Justification

State Highway 46 from Bulverde Road to Farm-to-Market (FM) 3159, Comal County, Texas

CSJs: 0215-07-027, 0215-01-044, 0215-01-051, & 0215-07-049

June 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 San Antonio District of the Texas Department of Transportation (TxDOT) proposes improvements to State Highway (SH) 46 from Bulverde Road to Farm-to-Market Road (FM) 3159, in two phases. The project area is within the city of Bulverde and unincorporated areas of Comal County, Texas. The total length of the two phases is seven miles. **Figure 1** in **Attachment A** shows the project location and limits, **Photographs 1** and **2** in **Attachment B** show representative views of the project's termini.

The purpose of this report is to determine the potential effect on the Golden-cheeked Warbler (*Setophaga* [=*Dendroica*] *chrysoparia*) from the proposed SH 46 project.

2.0 SITE DESCRIPTION

2.1 PROJECT DESCRIPTION

TxDOT proposes to widen SH 46 in Comal County, Texas, from two to six lanes with a raised median, beginning at Bulverde Road and continuing east to FM 3159, a distance of approximately 7 miles. SH 46 is classified as an urban/suburban arterial. The project would be constructed in phases. Phase I is from Farhills Drive to FM 3159. Phase II is from Bulverde Road to Farhills Drive.

The existing SH 46 facility within the overall project limits is a two-lane, undivided roadway. Lane widths are approximately 12 feet with shoulders of varying widths. Existing right-of-way is approximately 100 feet. The posted speed limit varies from 35 miles per hour (mph) to 65 mph.

The proposed SH 46 project would widen the roadway from its existing two-lane highway to two different configurations. The curbed with storm drain configuration, constructed in the more developed areas, would consist of six 11-foot travel lanes with a 16-foot raised median. The roadway would have 5-foot bike lanes and 6-foot sidewalks to accommodate cyclists and pedestrians. Drainage would be via underground storm sewer. Typical right-of-way width of the curbed with storm drain configuration would be 130 feet. The other configuration, a curbed with grass-lined open-ditch configuration, would be constructed in less developed areas and would consist of six 11-foot travel lanes with a 16-foot raised median. The roadway would have 5-foot bike lanes and 6-foot sidewalks to accommodate cyclists and pedestrians. Drainage would be via grass-lined open ditches. Typical right-of-way width for the curbed with grass-lined open-ditch configuration would be 170 feet. Additional right-of-way would be required for both roadway configurations. A grade-separated intersection would be constructed at SH 46 and FM 3159. The project would transition back to the existing two-lane configuration east of FM 3159.

Phase I of the proposed SH 46 project would extend between logical termini at Farhills Drive on the western end and FM 3159 on the eastern end with transitions to tie in to the existing pavement widths.

Phase II would extend between logical termini at Bulverde on the western end and Farhills Drive on the eastern end with transitions to tie in to the existing pavement widths. Each phase of the project has independent utility.

3.0 NATURAL SETTING AND LAND USE

Natural Setting

The project area is located within the Edwards Plateau ecoregion of Texas (Gould et al. 1960). The project area is underlain by two geologic formations: the Upper and Lower Glen Rose Formations. These formations are Cretaceous age and comprised of limestone, dolomite, and marl (TNRIS 2016).

Land Use

The proposed project area is located within the city of Bulverde and unincorporated areas within Comal County. The existing right-of-way is dedicated to transportation use. Land surrounding the existing right-of-way consists of a mixture of rural, residential, and commercial uses (**Photographs 3** through **6**).

Project Area Soils

According to data from the Natural Resources Conservation Service (NRCS), the proposed project is underlain by eight different soil types (NRCS 2016). The map unit symbol and names are listed in **Table 1** below.

Table 1: Project Area Soils

Map Unit Symbol	Map Unit Name
BrB	Bolar clay loam, 1 to 3 percent
BtD	Brackett Rock outcrop-Comfort complex, 1 to 8 percent slopes
BIG	Brackett Rock outcrop-Real complex, 8 to 30 percent slopes
DeB	Denton silty clay, 1 to 3 percent slopes
LeB	Lewisville silty clay, 1 to 3 percent slopes, eroded
Pt	Pits
PuC	Purves clay, 1 to 5 percent
SuB	Sunev clay loam, 1 to 3 percent slopes

4.0 PROJECT AREA VEGETATION

The project area is dominated by Low Intensity Urban and Edwards Plateau: Live Oak-Ashe Juniper Woodland Ecological Mapping Systems of Texas vegetation types. The project area also includes relatively small areas best described as Edwards Plateau: Live Oak-Ashe Juniper Shrubland, Edwards Plateau: Live Oak Motte and Woodland, Edwards Plateau: Savannah Grassland, and Row Crops. Existing vegetation at the site, as observed during the field investigations, is described below and shown on **Figures 2a–2g**.

The Urban Low Intensity vegetation type is described as maintained roadway grasses in the existing right-of-way. Vegetation was composed of native and non-native herbaceous species that are regularly mowed. These included little bluestem (*Schizachyrium scoparium*), Johnsongrass (*Sorghum halepense*), inland sea oats (*Chasmanthium latifolium*), Bermudagrass (*Cynodon dactylon*), plains love grass (*Eragrostis intermedia*), meadow garlic (*Allium canadense*), King Ranch bluestem (*Bothriochloa ischaemum*), saw green briar (*Smilax bona-nox*), southern dewberry (*Rubus trivialis*), and poison ivy (*Toxicodendron radicans*) (**Photograph 3**).

The Edwards Plateau: Live Oak-Ashe Juniper Woodland vegetation type composed a majority of the project area's unmaintained vegetation, especially in areas of proposed right-of-way. Dominant canopy species were plateau live oak (*Quercus fusiformus*) and Ashe juniper (*Juniperus ashei*); however, this vegetation type was highly variable within the project area, especially with respect to the age and percent composition of Ashe juniper, which is presumably a result of past land use practices. **Photographs 4** and **5** show general depictions of this vegetation type.

In many areas, Ashe juniper was a minor component of this woodland type, and individual trees were clustered very near to live oaks, often within or adjacent to the dripline. In these cases, typical average diameter at breast height (DBH) of Ashe juniper was less than 5 inches. Ashe juniper in these settings were more of an understory component than a canopy component, which resulted in highly variable canopy heights and cover percentage. Other dominant understory components included agarita (*Mahonia trifoliolata*), yaupon (*Ilex vomitoria*), and elbowbush (*Forestiera pubescens*). It appears that much of this woodland type has undergone selective clearing of Ashe juniper in the past that preserved the hardwood component, especially live oaks. In fact, recent juniper removal was evident in areas of proposed right-of-way where windrows of cut juniper could be seen amongst the remaining live oak trees.

In other areas, Ashe juniper was dense, almost to the exclusion of hardwood species. Here again, typical average DBH was less than 5 inches, and individual trees were relatively short (less than 15 feet) with dense low branches. This secondary successional pattern often results when Ashe juniper encroaches on previously cleared areas.

Some patches of co-dominant, mature oak and juniper woodlands were observed; however, these patches were typically less than an acre in size with high edge-to-interior ratios. Most of the largest Ashe juniper trees (12-15 inch DBH) were observed within the right-of-way and/or along the adjacent fence lines. These trees were often isolated from adjacent woodland areas and near to existing SH 46 (i.e., high edge ratio).

This vegetation type also contained sugarberry (*Celtis laevigata*), mustang grape (*Vitis mustangensis*), poison ivy, and joe-pye weed (*Eutrochium fistulosum*). This vegetation was observed in various locations throughout the proposed right-of-way along SH 46. Additional information on the occurrence of this vegetation type is provided below with reference to the locations of representative photographs, as shown on **Figures 2a-2g**.

The Edwards Plateau: Live Oak-Ashe Juniper Shrubland vegetation type had the same species composition as the Live Oak-Ashe Juniper Woodland, though in an earlier successional stage. Woody vegetation was shorter in height, lacked a clear overstory, and contained a more dominant shrub component. An additional species noted in this habitat type was Texas sotol (*Dasylirion texanum*). The vegetation was limited to mid-story and understory vegetation. (**Photographs 6** and **7**). This vegetation was observed in various locations throughout the proposed right-of-way along SH 46.

The Edwards Plateau: Live Oak Motte and Woodland was dominated by mottes of mature plateau live oaks with little mid-story. Some areas appeared to be actively grazed, removing horizontal cover. In addition to plateau live oak, species composition included agarita, Texas prickly pear (*Opuntia engelmanni* var. *engelmannii*), and Roosevelt weed (*Baccharis neglecta*). There were no Ashe junipers in this vegetation type. Herbaceous species included Brazilian vervain (*Verbena brasiliensis*), Canada wild rye (*Elymus canadensis*), and antelope horn milkweed (*Asclepias asperula*). This vegetation was observed in various locations throughout the proposed right-of-way along SH 46 (**Photograph 8** and **9**).

A small area of Edwards Plateau: Savannah Grassland was also observed in the proposed right-of-way along SH 46. The savannah vegetation type is characterized by scattered woody vegetation interspersed amid a grassland. This vegetation is a gradient between woodland and grasslands. Species composition was similar to the surrounding area, including plateau live oak, agarita, Ashe juniper, cedar elm (*Ulmus crassifolia*), little bluestem, and joe-pye weed (**Photograph 10**).

The relatively small areas of Row Crop were observed near the western terminus of the project area. These areas were devoid of vegetation and had been recently cleared, presumably for cultivation in the near future (**Photograph 11**). This vegetation type offers little habitat value for wildlife.

The Disturbed Prairie vegetation type represents plant communities recovering from past agricultural uses observed in the proposed right-of-way. Vegetation was composed of native and non-native species in relatively early successional stages with a minor woody species component. The vegetation was not maintained. Species included Roosevelt weed, Johnsongrass, little bluestem, southern dewberry, joe-pye weed, and panic switchgrass (*Panicum virgatum*) (**Photograph 12**).

5.0 BIOLOGICAL RESOURCES

5.1 ENDANGERED SPECIES ACT

The U.S. Fish and Wildlife Service (USFWS) regulates the take of federally listed threatened and endangered species. No habitat for federally listed endangered or threatened species occurs in the project area.

5.2 MIGRATORY BIRD TREATY ACT

The project area was investigated for any structures containing migratory birds or indications of nesting migratory birds. No migratory birds were observed nesting during the site visit, although individuals may arrive in the project area to breed during construction of the proposed project. Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young in accordance with the Migratory Bird Treaty Act, through phasing of work or preventative measures. Bird best management practices (BMPs) will be followed to minimize impacts. Bird BMPs include not disturbing, destroying, or removing active nests, including those of ground nesting birds, during the nesting season; avoiding the removal of unoccupied, inactive nests, as practicable; preventing the establishment of active nests during the nesting season on TxDOT-owned and -operated facilities and structures proposed for replacement or repair; and not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

6.0 HABITAT ASSESSMENT FOR GOLDEN -CHEEKED WARBLER

6.1 SPECIES LIFE HISTORY

The proposed project is within range of the federally endangered Golden-cheeked Warbler (GCWA), a small insectivorous songbird that nests exclusively in Central Texas. The species inhabits juniper-oak woodlands in Central Texas during the nesting season, typically March to early summer and winters in Mexico, Guatemala, Honduras, and Nicaragua. Males are characterized by yellow cheeks with a black stripe from the beak to the nape, extending through the eye. The wings are black with two white wing bars, and the crown, upperparts, throat, neck, and upper breast are white with black streaking throughout. The female has similar plumage but is less colorful. The wings and tail are grey with yellow-olive green upperparts. The cheeks are a muted yellow compared to their male counterpart (USFWS 1990). The primary threats to the species are habitat destruction and habitat fragmentation (USFWS 1990).

The GCWA occurs in 31 counties in Central Texas, following the distribution of Ashe juniper, which it depends on for nest material. This species breeds primarily in April and May, and typically lays three or four eggs. The nest is a small cup composed of strips of juniper bark lined with fur and feathers, bound by cobwebs. It is typically 4.5 meters from the ground (USFWS 1990). Nestlings fledge around

8 or 9 days of age and remain in a loose family group while both parents care for them. The species feeds on a variety of insects and spiders (USFWS 1990).

6.2 HABITAT DESCRIPTION

The GCWA has a distinct habitat requirement of mature juniper-oak forests with old-growth juniper that it relies on for several features, including closed canopy, canopy height, and strips of shedding bark from the older trees. Ashe junipers with long, fine, bark strips suitable for nest material begin shedding bark at the base of the tree at approximately 20 years of age and in the canopy at approximately 40 years of age. Deciduous oaks (*Quercus* spp.), including Texas Oak (*Quercus buckleyi*) and scrub oak (*Quercus durandii breviloba*), are also important components for foraging habitat (USFWS 1990). The species requires closed canopy, averaging >70%, and old growth canopy height, approximately 4 to 7.5 meters high. A vital component of indicating maturity of the trees is the DBH. Suitable Ashe junipers have a DBH greater than or equal to 5 inches (USFWS 1990). The preferred topography is canyons, slopes and associated creek bottoms (Campbell 2003).

The species also requires relatively large tracts of habitat with low edge, at a density of approximately 15 pairs per 247 acres. Tracts smaller than 50 acres are typically not considered suitable for occupancy (Groce et al. 2010). Open edge and forest fragmentation are negatively associated with occupancy and density of the species (Reidy et al. 2016). High density of edge has a negative effect on reproductive success of the species (Peak and Thompson 2014).

6.3 SH 46 HABITAT ASSESSMENT

The SH 46 project area is located within the historic range of the GCWA (**Figure 3**). A habitat assessment was completed within the existing and proposed right-of-way utilizing a combination of desktop analysis (vegetation mapping, soils information, and geology information) and field verification by qualified biologists (USFWS Species Recovery Permit # TE168185-3 and TPWD Scientific Research Permit # SPR-0691-409). Field assessments were completed by permitted biologists in February and April of 2016 as well as June 2018. The following is a sheet-by-sheet description of areas mapped by the project biologists as Edwards Plateau: Live Oak-Ashe Juniper Woodland. Please see **Figure 2** for aerial depictions and approximate photo locations.

Figure 2a:

Vegetation mapped as Live-Oak Ashe Juniper Woodland north of SH 46 is located in a small strip of unmaintained vegetation surrounded and dissected by roadways. The average DBH of Ashe junipers in this area is less than 5 inches. This area lacks the required canopy cover, patch size, and absence of edge required for suitable nesting habitat (**Photo 13**).

Figure 2b:

Vegetation mapped as Live-Oak Ashe Juniper Woodland in these areas is largely surrounded by residential and some commercial development. Residential areas north of SH 46 were typically dominated by live oak, with the exception of small unmaintained areas (e.g., near drainages and property borders). See **Photo 14**. A small patch of vegetation with mature Texas oak and Ashe juniper trees was observed south of SH 46 and east of Farhills Drive. Commercial development to the east and residential development and roads to the south essentially isolated this patch of co-dominant oak and juniper woodland, which was further restricted to the eastern slope of a small hill (**Photo 15**). This area had sufficient canopy cover and Ashe juniper maturity (greater than or equal to 8 inches DBH), though the patch size is considerably smaller than the 50 acres typically required by the species. West of this small patch of vegetation, on the western slope of the previously mentioned small hill, Ashe juniper was young and dense. Live oak was present, though it was a minor component, and it was also young. This area may have been previously cleared (**Photo 16**). These areas lack the required canopy cover, patch size, and absence of edge required for suitable nesting habitat.

Figure 2c:

Vegetation mapped as Live-Oak Ashe Juniper Woodland north and south of SH 46 is located in very small isolated strips surrounded by urban development. Some of these strips have been essentially cleared of Ashe Juniper. These areas lack the required canopy cover, patch size, and absence of edge required for suitable nesting habitat.

Figures 2d and 2e:

Vegetation mapped as Live-Oak Ashe Juniper Woodland north and south of SH 46 is located in small strips of unmaintained vegetation. The areas north of SH 46 are small isolated patches surrounded by roadways and development. The strip south of SH46 has only a small line of trees within the proposed project area and, east of Brentwood Drive, this area is intersected by a waterline easement that is cleared of woody vegetation. Much of the adjacent land is used for cattle grazing and Ashe juniper has apparently been selectively removed. These areas lack the required canopy cover, patch size, and absence of edge required for suitable nesting habitat. See **Photo 17**.

Figure 2f:

Vegetation mapped as Live-Oak Ashe Juniper Woodland south of SH 46 and tiny patches north of SH 46 were characterized by patchy vegetation of live oaks with Ashe junipers selectively cleared. The clearing of Ashe junipers appears to be a current management regime for ranching purposes. The strip south of SH 46 is intersected by a waterline easement parallel to SH 46. Ashe junipers occur most often around the trunks of mature live oaks and they do not reach the canopy layer. The typical DBH of Ashe junipers in this area is less than 5 inches. Isolated mature Ashe junipers were observed in the

existing right-of-way. This area lacks the required canopy cover, patch size, and absence of edge required for suitable nesting habitat. See **Photos 18, 19,** and **20**.

Figure 2g:

Vegetation mapped as Live-Oak Ashe Juniper Woodland south of SH 46 between Smithson Valley Road and Smithson Valley High School was characterized by a dominance of oaks with a midstory of agarita, Texas persimmon (*Diospyros texana*), and a minor component of young Ashe junipers less than 5 inches in DBH. This area lacks canopy cover, mature Ashe junipers, patch size, and absence of edge required for suitable nesting habitat. See **Photo 21**.

Vegetation mapped as Live-Oak Ashe Juniper Woodland north of SH 46 and east of Smithson Valley Road was highly variable. Some stands had mature Ashe juniper (DBH 6 – 8 inches) that reached the canopy level mixed with live oak trees in a composition suitable for GCWA habitat. However, this area was isolated and small with a high edge ratio (**Photo 22**). Other areas are open with scrubby Ashe Juniper and grasses. The average DBH of Ashe junipers in this area is less than 5 inches (**Photo 23**). Other wooded areas were dominated by oak with an understory of young Ashe Juniper (**Photo 24**). Two large Ashe juniper trees were observed within the existing right-of-way with a DBH of approximately 15 inches; however, these trees were approximately 15 feet from the edge of the SH 46 pavement and they were surrounded by woodlands that were not suitable due to a lack of canopy cover, small patch size, and high edge ratios.

NDD Data

TPWD's Texas Natural Diversity Database (NDD) was accessed in order to locate the nearest reported occurrences of GCWA to the project area. As there are no occurrences of the species within the project area, the closest recorded occurrence was associated with Honey Creek State Natural Area and is located approximately 3.0 miles northwest of the proposed project area (see **Attachment C: Golden-cheeked Warbler NDD EO Report- EO Id 6126**) (TPWD 2018). The sightings are associated with canyonlets (draws) to Honey Creek in riparian vegetation. It should be noted that NDD data cannot be used for presence/absence determination.

Aerial Imagery

Based on historic and current imagery, vegetation adjacent to SH 46 does not meet the minimum patch size requirements for the species. Effects of past land use on forest structure are evident on historic imagery. For example, the area south of SH 46 adjacent to the intersection of Sun Valley Road was largely void of vegetation in 1973 (NETRO 2018). Aerials depict a heavily dissected landscape with areas of bare ground (Google Earth 2018).

7.0 CONCLUSION AND EFFECT DETERMINATION

The project area lacked the abundance of old growth Ashe junipers and contiguous habitat void of edge required by the species. The Live Oak-Ashe Juniper Woodland vegetation has been highly modified by ranching and has undergone selective Ashe juniper removal. The entire corridor is abutted by urban development, creating a long stretch of edge habitat adjacent to SH 46. The topography for the project area is characterized by relatively flat to rolling uplands, which are not preferable for the species. A very minimal number of potentially mature Ashe juniper trees, that the species requires for nest construction, were observed in the project area, though they were observed in areas that, as mentioned above, did not meet habitat specifications for the species. No suitable nesting habitat occurred within the project area.

This report has been prepared to address the proposed construction of SH 46 in Comal County, Texas, in compliance with Section 7 of the Endangered Species Act of 1973, as amended. Specifically, this report assesses the effects of the proposed action on the federally listed GCWA. Cox|McLain Environmental Consulting, Inc. has determined that the proposed project would have no effect on the listed species due to lack of suitable habitat within the project area.

8.0 REFERENCES

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Attachment A- Figures

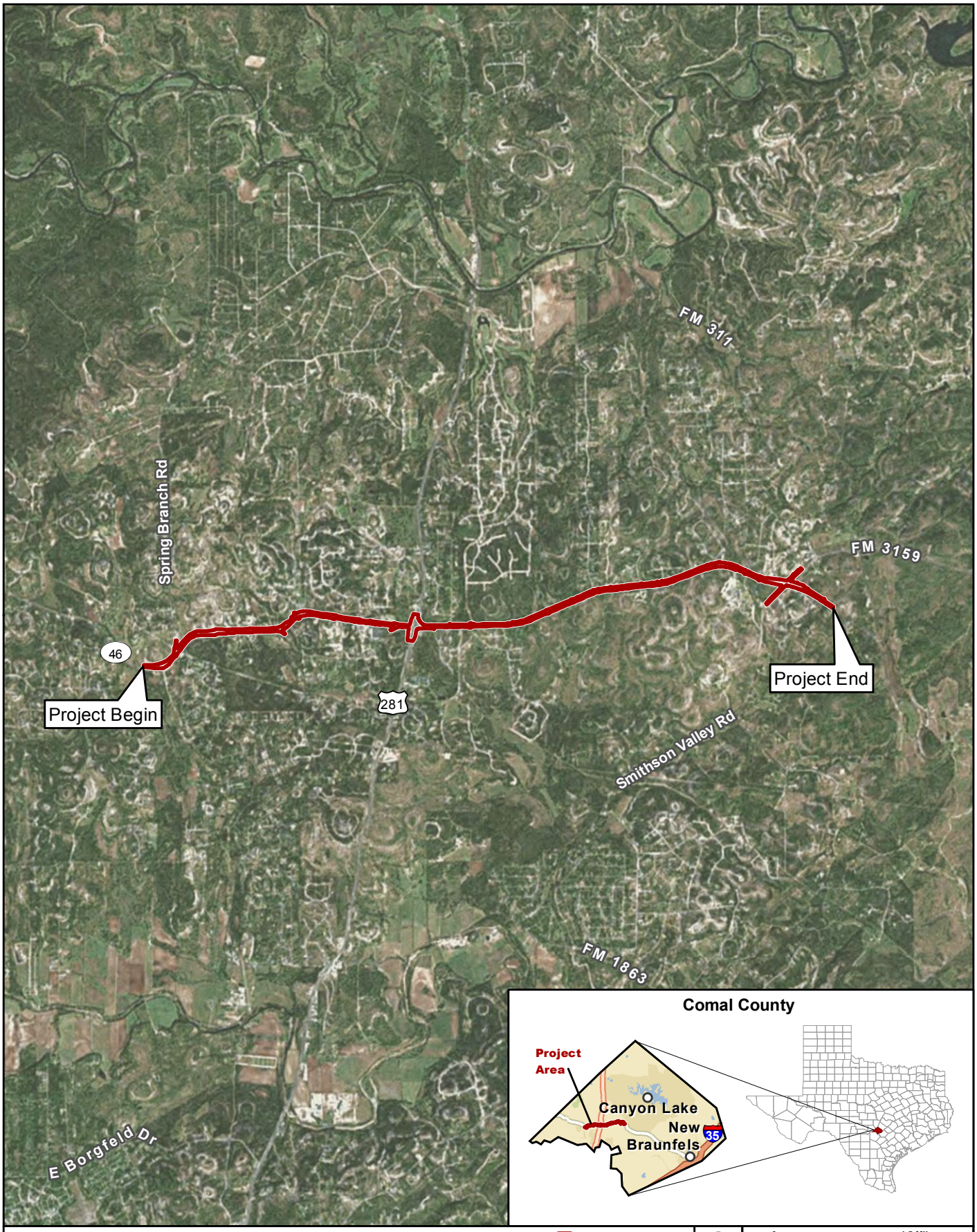

Figure 1

Project Location (Aerial Base)

SH 46 from Bulverde Rd to FM 3159

Project Location

Basemap Source: ESRI (2015)

0 1.5 Miles

0 2 Kilometers

Prepared for: TxDOT	1 in = 1.5 miles
	Scale: 1:95,040
CSJ: 0215-01-044, 0215-07-027	Date: 10/19/2016

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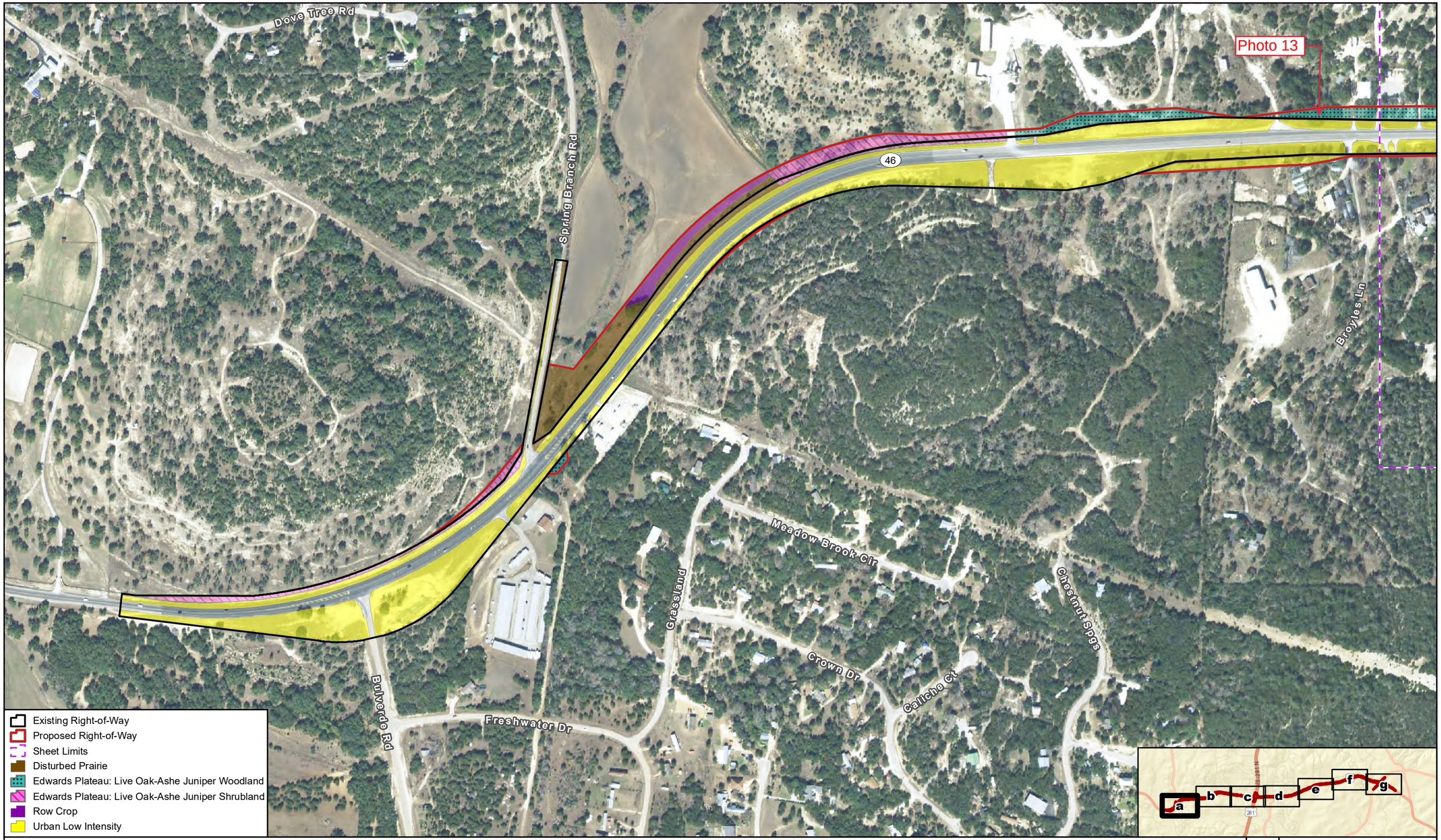

Figure 2a

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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Figure 2b

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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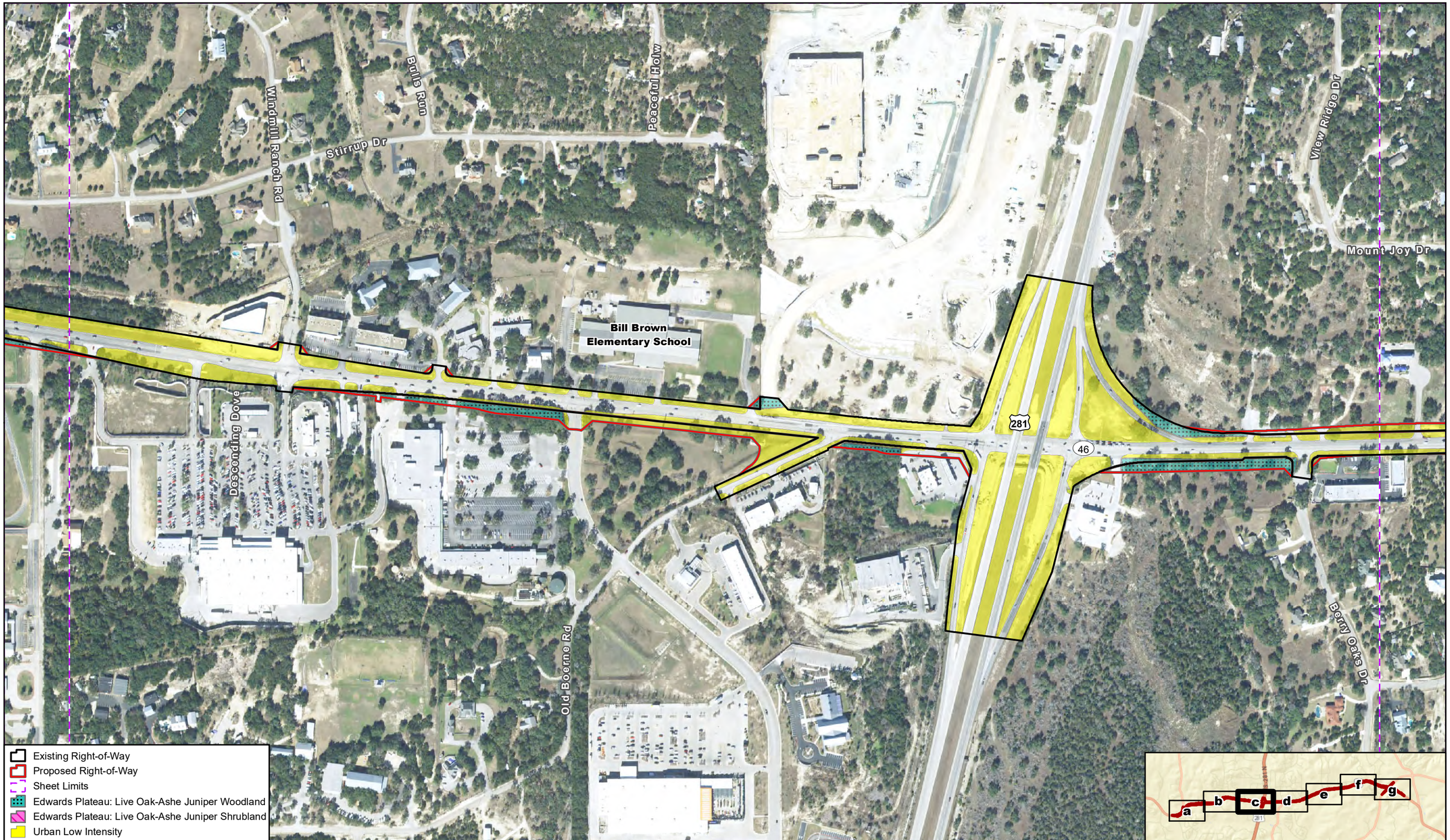

Figure 2c

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

0 400 Feet
0 120 Meters

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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Figure 2d

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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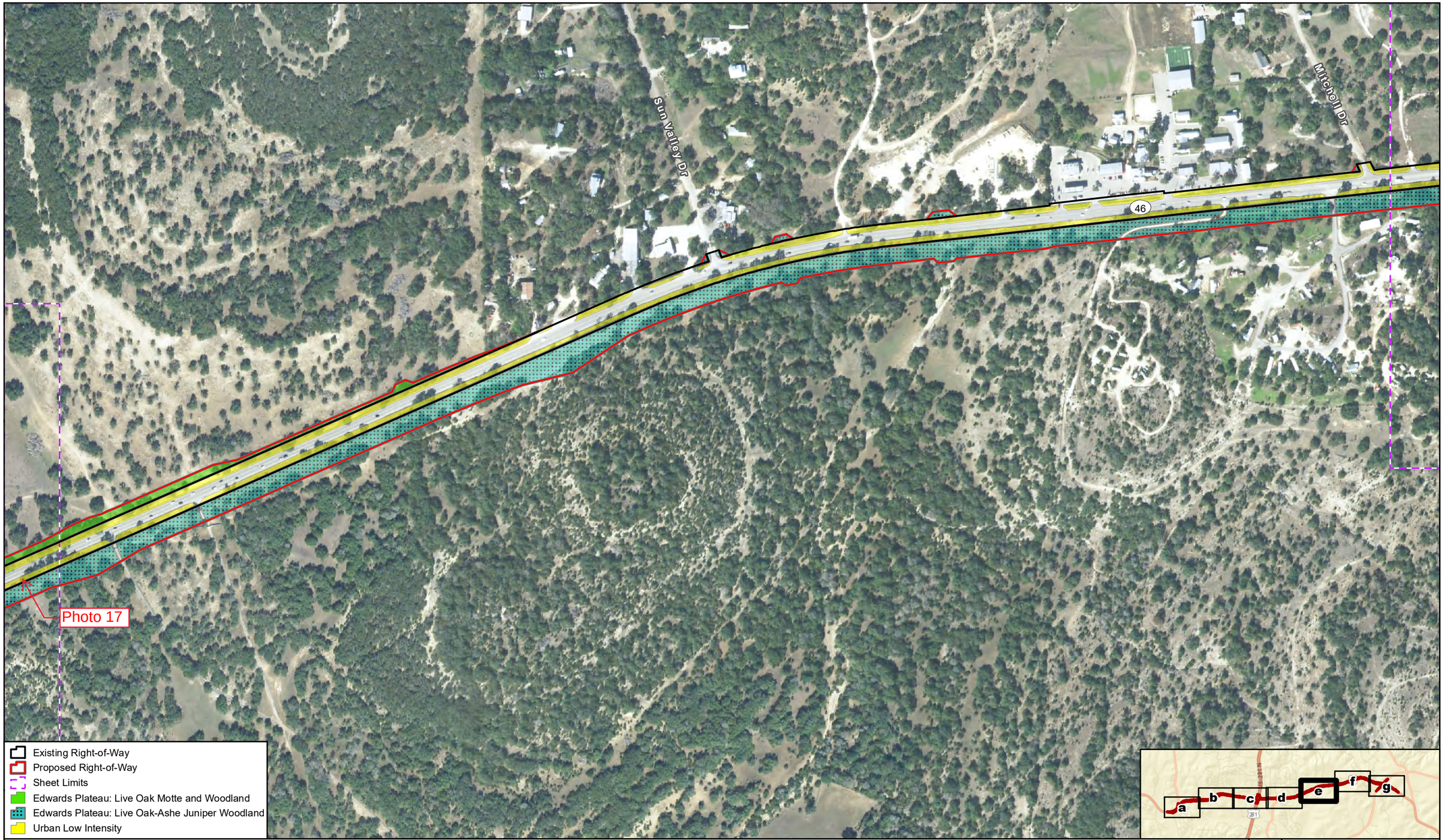

Figure 2e

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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Figure 2f

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

0 400 Feet
0 120 Meters

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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Figure 2g

Observed Vegetation Types

SH 46 from Bulverde Rd to FM 3159

Data Source: CMEC (2016)
Aerial Source: NAIP (2015)

Prepared for: TxDOT	1 in = 400 feet
	Scale: 1:4,800
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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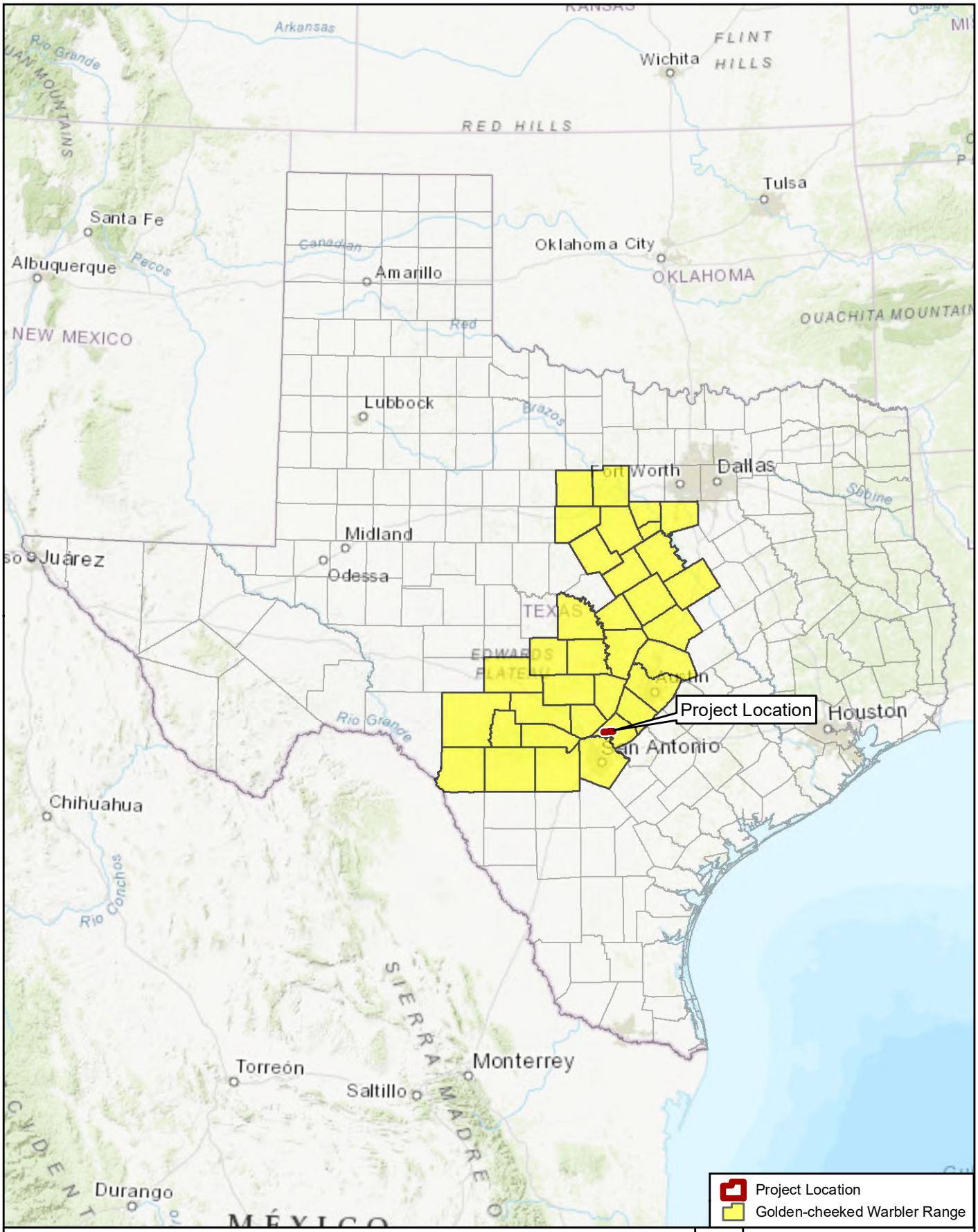

Figure 3

Range of the Golden-cheeked Warbler in Texas

SH 46 from Bulverde Rd to FM 3159

Data Source: TPWD
Basemap Source: ESRI (2018)

Prepared for: TxDOT	1 in = 110 miles
	Scale: 1:6,969,600
CSJ: CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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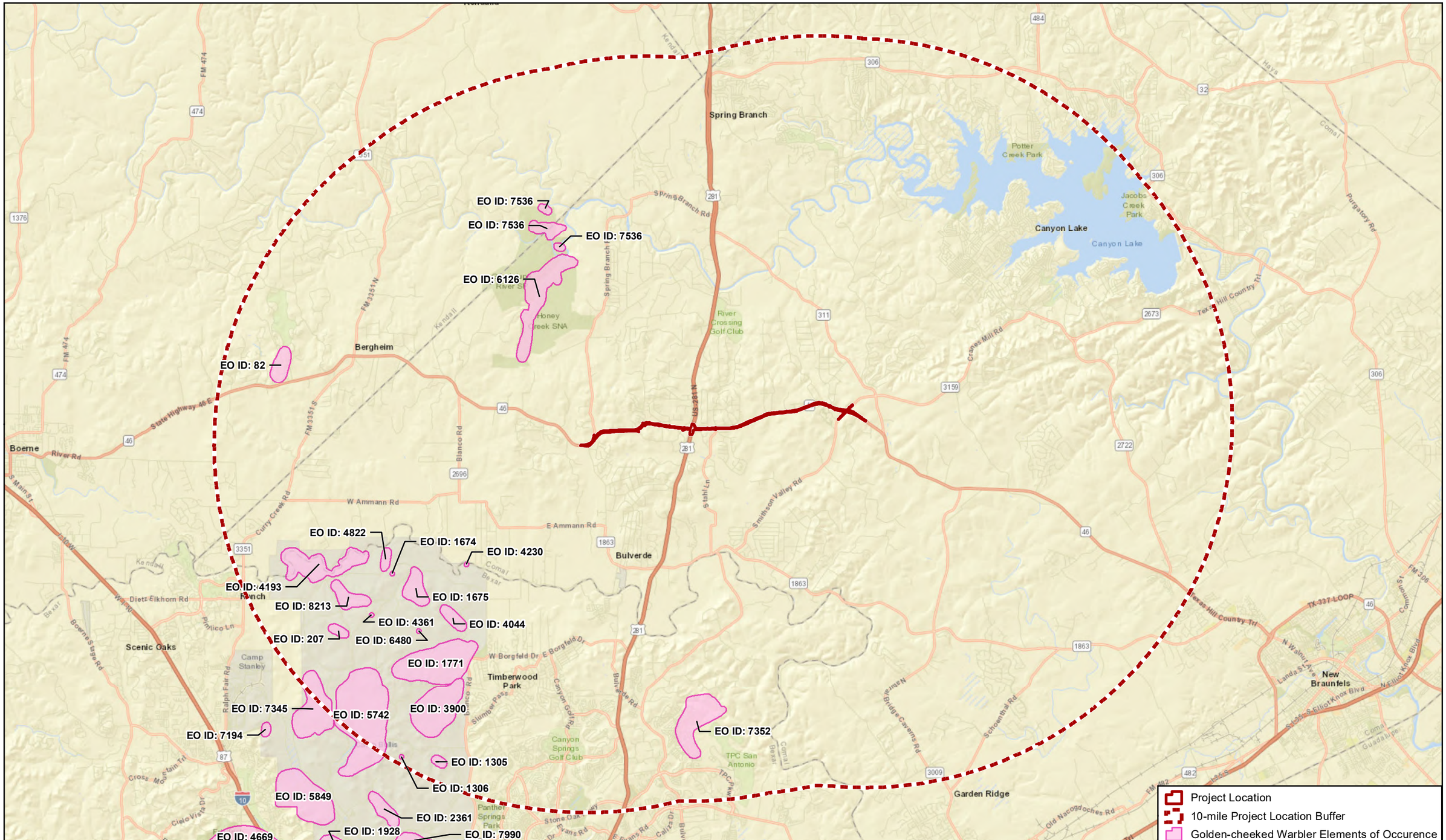

Figure 4

TXNDD Elements of Occurrence for the Golden-cheeked Warbler

SH 46 from Bulverde Rd to FM 3159

Data Sources: TPWD (4/30/2018)
Basemap Source: ESRI (2018)

0 2.5 Miles
0 4 Kilometers

Prepared for: TxDOT	1 in = 2.5 mile
	Scale1:158,400
CSJ: 0215-01-044, 0215-07-027	Date: 5/29/2018

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Attachment B- Project Area Photographs

Photo 1: Western project limit; facing east.

Photo 2: Eastern project limit; facing west.

Photo 3: Proposed project area and Urban Low Intensity habitat type along the existing right-of-way; facing west.

Photo 4: Proposed project area and Edwards Plateau: Live Oak-Ashe Juniper Woodland habitat type in the proposed right-of-way; facing west.

Photo 5: Edwards Plateau: Live Oak-Ashe Juniper Woodland habitat type in the proposed right-of-way; facing southwest. Plateau live oaks are mature while the Ashe junipers are not.

Photo 6: Edwards Plateau: Live Oak-Ashe Juniper Shrubland habitat type in the proposed right-of-way; facing north.

Photo 7: Edwards Plateau: Live Oak-Ashe Juniper Shrubland habitat type in the proposed right-of-way; facing north.

Photo 8: Edwards Plateau: Live Oak Motte and Woodland habitat type in the proposed right-of-way; facing north.

Photo 9: Edwards Plateau: Live Oak Motte and Woodland (background) and Disturbed Prairie (foreground) habitat types in the proposed right-of-way; facing west.

Photo 10: Edwards Plateau: Savannah Grassland habitat type within the proposed right-of-way; facing north.

Photo 11: Row crop habitat type within the proposed right-of-way; facing north.

Photo 12: Disturbed Prairie Vegetation type (to the left of the fence); facing east.

Photo 13: Live-Oak Ashe Juniper Woodland north of SH 46, viewing north. Note the difference in age between the live oak and Ashe Juniper.

Photo 14: Live-Oak Ashe Juniper Woodland north of SH 46, viewing west. Note selective preservation of live oak with remnant, young Ashe juniper near the drainage in the distance.

Photo 15: Live-Oak Ashe Juniper Woodland south of SH 46 and east of Farhills Drive, viewing south. This stand had potentially suitable composition and structure; however, it is fragmented by commercial development, residential access roads, and the existing SH 46 (**Figure 2b**).

Photo 16: Live-Oak Ashe Juniper Woodland south of SH 46 and east of Farhills Drive, viewing south. This stand was dominated by dense, young Ashe juniper and had a minor component of young live oak (**Figure 2b**).

Photo 17: Live-Oak Ashe Juniper Woodland south of SH46, viewing southeast. The bare ground in the foreground is due, in part, to a waterline easement that lies parallel to SH 46. Notice absence of mature Ashe junipers, variability of canopy heights, and variability of canopy cover, presumably due to selective clearing (**Figure 2d**).

Photo 18: Live-Oak Ashe Juniper Woodland south of SH46, viewing southwest. Notice the pipeline easement in the foreground, the difference in age between live oaks and Ashe Juniper in the proposed right-of-way, and the isolated mature Ashe juniper in the existing right-of-way. The area is generally characterized by. patchiness of vegetation, high amount of edge, absence of mature Ashe junipers due to selective clearing (**Figure 2f**).

Photo 19: Live-Oak Ashe Juniper Woodland south of SH46, viewing southwest. Note the easement in the foreground and the oak-dominated woodland in the distance. Ashe juniper made up a minor, understory component.

Photo 20: Live-Oak Ashe Juniper Woodland south of SH46, viewing east. Note the easement in the foreground and the oak-dominated woodland in the distance. Ashe juniper made up a minor, understory component.

Photo 21: Immature Ashe juniper trees with low canopy cover and high edge south of SH 46 between Smithson Valley Road and Smithson Valley High School, viewing southeast (**Figure 2g**).

Photo 22: Mature Ashe juniper trees with mixed hardwoods north of SH 46 and east of Smithson Valley Road, viewing north. This stand has suitable tree ages and composition. The stands lacks adequate extent and it has a high edge ratio, as evidenced by the sun-lit area in the distance (edge of the stand) (**Figure 2g**).

Photo 23: Open canopy with high edge ratio in the vegetation north of SH 46 and east of Smithson Valley Road (**Figure 2g**).

Photo 24: Oak-dominated woodland patch north of SH 46, viewing north. Note the young, shrubby, patchy Ashe juniper in the foreground and the mature oak canopy visible in the distance (**Figure 2g**).

Photo 25: Mature Ashe juniper in the existing right-of-way, viewing northwest. Note the proximity to SH 46, which is visible in the left of frame. Ashe junipers in the adjacent proposed right-of-way were considerably younger (see **Photo 24**) (**Figure 2g**).

Attachment C- Golden-cheeked Warbler NDD EO Report- EO Id 6126

Element Occurrence Record

Scientific Name: Setophaga chrysoparia **Occurrence #:** 1 **Eo Id:** 6126

Common Name: Golden-cheeked Warbler **Track Status:** Track all extant and selected historical EOs

Identification Confirmed: Y - Yes **TX Protection Status:** E

Global Rank: G2 **State Rank:** S2B **Federal Status:** LE

Location Information:

Directions

WEST ON HIGHWAY 46 FROM INTERSECTION WITH HIGHWAY 281 FOR 3 MILES, THEN NORTH ON PARK ROAD 31 TO ENTRANCE OF GUADALUPE RIVER STATE PARK; ENTRANCE TO NATURAL AREA IS WITHIN PARK

Survey Information:

First Observation: 1988-05 **Survey Date:** 2000-04-11 **Last Observation:** 2000-04-11

Eo Type: **Eo Rank:** A **Eo Rank Date:** 1999-05-01

Observed Area:

Comments:

General Description: RIPARIAN VEGETATION OF SMALL, SPRINGFED STREAM. TRIBUTARY DRAWS TO MAIN STREAM CHANNEL CONTAIN SINGING MALES. LIVE OAK - JUNIPER PLANT COMMUNITY.

Comments: GOOD HABITAT WITHIN RANGE OF SPECIES; MANY SINGING MALES NOTED BY OBSERVER; IN 2000, BROWN-HEADED COWBIRDS FAIRLY COMMON IN WARBLER HABITAT

Protection Comments: ADEQUATE PROTECTION BY CONSERVATION EASEMENT AFTER TRANSFER.

Management Comments:

Data:

EO Data: 8 SINGING MALES/100 HA. OBSERVED IN SPRING 1988 DURING BREEDING SEASON IN SIDE CANYONLETS (DRAWS) TO MAIN HONEY CREEK, IMMATURES ALSO SEEN; IN 1992, TNC REPORTED ONE; IN 1993, NO GCW WERE OBSERVED; IN 1995, 15 GCW TERRITORIES WERE FOUND ON HONEY CREEK SNA, FEMALE WARBLERS WERE OBSERVED WITH SEVEN OF THE MALES ON HONEY CREEK SNA; IN 1999, 22 TERRITORIES; IN 2000, 13 TERRITORIES

Community Information:

Scientific Name:	Stratum:	Dominant:	Lifeform:	Composition Note:

Reference: