Appendix B

Technical Memoranda and Reports

Technical memoranda and reports were prepared as independent documents to support the preparation of the Final Environmental Impact Statement (FEIS) for the Cotton Belt Corridor Regional Rail Project. Information from these documents was incorporated into the FEIS to provide information on existing conditions, and in some cases assess potential impacts to the resources. Information contained in the FEIS is the most current and supersedes information in the technical memoranda and reports.
B-14

Biological Resources

Technical Memorandum
Memo

Date: Friday, September 08, 2017

Project: Cotton Belt Corridor

To: John Hoppie, Project Manager, DART Capital Planning

From: Tom Shelton, GPC6 Program Manager

Subject: DART GPC VI; Contract Number: C-2012668; Cotton Belt Corridor Biological Resources Existing Conditions Technical Memorandum; HDR PN: 10024656

Introduction: This technical memorandum describes the vegetative and wildlife communities found within and adjacent to the Cotton Belt rail project area which could be impacted by construction of the proposed project.

The biological resource study area used for the assessment of impacts generally includes the project study area. However, a much larger search radius (10 miles) was used in the examination of threatened or endangered species occurrence data. Existing literature and mapping were reviewed for the project study area to identify potential vegetative communities, potential wildlife assemblages, and threatened or endangered species of potential occurrence. Maps examined include aerial imagery for the project study area, United States Geological Survey (USGS) topographic maps for the Garland, Grapevine, Carrollton, Plano, and Addison, Texas quadrangles (USGS, 1973; USGS, 1981), and Geographic Information Shapefiles (GIS) obtained from the Texas Parks and Wildlife Department’s (TPWD) Ecological Systems Classification and Mapping Project (EMST), and the Texas Commission on Environmental Quality’s Ecoregions of Texas.

This report was built upon detailed field investigations conducted by project biologists in 2011 and 2013 for the Cotton Belt project, and additional field reconnaissance in May 2017 to verify vegetative communities, wildlife habitat, migratory bird use, and potential habitat for rare, threatened and endangered species within the project study area.

Description of Existing Conditions: This section describes the existing natural vegetation types, ecoregion and Biotic Province areas found within the project study area, and provides information regarding rare, threatened, or endangered species of potential occurrence in Collin, Dallas, and Tarrant counties.

Ecoregion and Biotic Province

The study area occurs within the Northern Blackland Prairie Ecoregion (Figure 2-1) (Griffith et al, 2007). This ecoregion includes rolling to nearly level plains which stretch from Sherman in the
Figure 2-1
DART Cotton Belt
Ecoregions of Texas

Legend

Source: Griffith et. al., 2007.
north to San Antonio in the south. Historically this area was distinguished by a vast expanse of tallgrass prairie vegetation. This vegetation was supported by frequent fire events which suppressed invading woody species and stimulated the growth of grass and forbs. In addition, the grazing of bison within this area resulted in the production of organic matter and the spreading of seeds within the disturbed soil of the area, helping to sustain it.

Historical vegetation of this ecoregion was originally dominated by little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), yellow Indiangrass (*Sorghastrum nutans*), and tall dropseed (*Sporobolus compositus*). In lowlands areas the dominant grasses included eastern gamagrass (*Tripsacum dactyloides*), switchgrass (*Panicum virgatum*), and Silveus dropseed (*Sporobolus silveanus*). Common forb species consisted of Mead’s sedge (*Carex meadiii*), prairie bluets (*Stenaria nigricans*), and black-eyed susan (*Rudbeckia hirta*). Woody species which are often found on stream bottoms include bur oak (*Quercus macrocarpa*), Shumard oak (*Quercus shumardii*), sugar hackberry (*Celtis laevigata*), elm (*Ulmus spp.*), ash (*Fraxinus spp.*), eastern cottonwood (*Populus deltoides*), and pecan (*Carya illinoiinensis*) (Diamond and Smeins 1993). The majority of the Northern Blackland Prairie has since been converted to agricultural or urban uses.

The study area is also located within the Texan Biotic Province ([Figure 2-2](#)) (Blair, 1950). The Texan Biotic Province is a variable region which trends from north to south, extending from the Red River to the Gulf Coast. This province includes sandy soils which support the growth of post oak-blackjack oak-hickory savannahs scattered among tallgrass prairies (Werler and Dixon, 2000). This biotic province also contains numerous interior wetland areas including freshwater marshes, peat bogs, and major river systems.

**Vegetation**

According to *The Vegetation Types of Texas*, three vegetation types are mapped within the project study area: “Urban”, “Crops”, and “Other Native and/or Introduced Grasses” (McMahan et al., 1984) ([Figure 2-3 to 2-6](#)). “Urban” vegetation occurs within approximately 36% of the project study area, and generally consists of maintained grasses in yards and transportation right-of-way, along with various ornamental plantings. “Crops” occurs within approximately 49% of the study area, and includes cultivated cover crops or row crops used for the purpose of producing food and/or fiber for either man or domestic animals. This type also includes grassland associated with crop rotations. The remaining areas within the study area, or approximately 15%, include “Other Native and/or Introduced Grasses” which consists of mixed native or introduced grasses and forbs on grassland sites or mixed herbaceous communities resulting from the clearing of woody vegetation.

Within the project study area, vegetation found in association with residential areas and commercial developments is generally comprised of turf grasses, such as bermudagrass (*Cynodon dactylon*) or St. Augustine grass (*Stenotaphrum secundatum*), and ornamental plantings which can include a variety of types of trees, shrubs, or herbaceous plants.
Figure 2-2
DART Cotton Belt
Biotic Provinces of Texas

Legend
- Proposed Alignment

Province
- Austroriparian
- Balconian
- Chihuahuan
- Kansan
- Navahonian
- Tamaulipan
- Texan
- Counties

Source: W. Frank Blair, 1950.
Figure 2-3
Eco Regions in the Cotton Belt Study Area
Data Source: Texas Parks and Wildlife, 2017

Cotton Belt Corridor Regional Rail Project
Draft Environmental Impact Statement
Figure 2-4
Eco Regions in the Cotton Belt Study Area
Data Source: Texas Parks and Wildlife, 2017
Figure 2-5
Eco Regions in the Cotton Belt Study Area
Data Source: Texas Parks and Wildlife, 2017
Undeveloped land, including parks and stream corridors, may include vegetation types such as grasslands, savannahs, or woodlands. Stream corridors often have riparian woodland vegetation growing along their banks. Grasslands may include a variety of native and nonnative grasses and forbs. Savannahs have grassland vegetation along with invading woody shrubs and trees. Woodlands in the project vicinity are likely to be dominated by a variety of deciduous and evergreen tree species with an understory consisting of grasses, forbs, and small shrubs or vines.

A more detailed vegetation analysis was also performed within the project study area using Ecological Mapping Systems (EMST) shapefiles which were used to estimate vegetation areas and unique habitat types within the study area. The EMST data set provides an updated ecological system classification for Texas which includes more land cover classes than were previously identified for the state (TPWD, 2016). The spatial resolution of this data was developed by first classifying the existing vegetation, and then modeling the resulting ecological systems by overlaying data such as land position, slope, aspect, and soil type. The data was then clipped using the study area shapefile, and lists of specific area vegetation types were determined (Table 2-1). A calculation of the percent area and acres of each vegetation type was then created to support the determination of possible significant vegetation area impacts within the study area.

### Table 2-1. EMST Vegetation Types within the Study Area

<table>
<thead>
<tr>
<th>Vegetation Type*</th>
<th>Acres</th>
<th>% of Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Low Intensity</td>
<td>5,181.52</td>
<td>43.11</td>
</tr>
<tr>
<td>Urban High Intensity</td>
<td>3,754.43</td>
<td>31.23</td>
</tr>
<tr>
<td>Blackland Prairie: Disturbance or Tame Grassland</td>
<td>1,010.84</td>
<td>8.41</td>
</tr>
<tr>
<td>Native Invasive: Deciduous Woodland</td>
<td>719.61</td>
<td>5.99</td>
</tr>
<tr>
<td>Central Texas: Floodplain Hardwood Forest</td>
<td>365.46</td>
<td>3.04</td>
</tr>
<tr>
<td>Row Crops</td>
<td>343.38</td>
<td>2.86</td>
</tr>
<tr>
<td>Crosstimbers: Post Oak Woodland</td>
<td>88.45</td>
<td>0.74</td>
</tr>
<tr>
<td>Central Texas: Riparian Hardwood Forest</td>
<td>72.58</td>
<td>0.60</td>
</tr>
<tr>
<td>Central Texas: Floodplain Herbaceous Vegetation</td>
<td>66.06</td>
<td>0.55</td>
</tr>
<tr>
<td>Barren</td>
<td>49.91</td>
<td>0.42</td>
</tr>
<tr>
<td>Crosstimbers: Savanna Grassland</td>
<td>27.86</td>
<td>0.23</td>
</tr>
<tr>
<td>Native Invasive: Mesquite Shrubland</td>
<td>25.59</td>
<td>0.21</td>
</tr>
<tr>
<td>Edwards Plateau: Oak / Hardwood Motte and Woodland</td>
<td>21.69</td>
<td>0.18</td>
</tr>
<tr>
<td>Grass Farm</td>
<td>20.43</td>
<td>0.17</td>
</tr>
<tr>
<td>Swamp</td>
<td>15.14</td>
<td>0.13</td>
</tr>
<tr>
<td>Edwards Plateau: Oak / Hardwood Slope Forest</td>
<td>7.11</td>
<td>0.06</td>
</tr>
<tr>
<td>Central Texas: Floodplain Hardwood / Evergreen Forest</td>
<td>6.59</td>
<td>0.05</td>
</tr>
<tr>
<td>Central Texas: Floodplain Live Oak Forest</td>
<td>3.46</td>
<td>0.03</td>
</tr>
<tr>
<td>Edwards Plateau: Savanna Grassland</td>
<td>3.09</td>
<td>0.03</td>
</tr>
</tbody>
</table>
Cotton Belt Corridor Regional Rail Project

<table>
<thead>
<tr>
<th>Vegetation Type*</th>
<th>Acres</th>
<th>% of Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native Invasive: Juniper Shrubland</td>
<td>2.50</td>
<td>0.02</td>
</tr>
<tr>
<td>Central Texas: Riparian Herbaceous Vegetation</td>
<td>2.49</td>
<td>0.02</td>
</tr>
<tr>
<td>Edwards Plateau: Live Oak Motte and Woodland</td>
<td>1.21</td>
<td>0.01</td>
</tr>
<tr>
<td>Central Texas: Riparian Deciduous Shrubland</td>
<td>0.59</td>
<td>0.005</td>
</tr>
<tr>
<td>Central Texas: Floodplain Evergreen Shrubland</td>
<td>0.50</td>
<td>0.004</td>
</tr>
<tr>
<td>Central Texas: Floodplain Deciduous Shrubland</td>
<td>0.46</td>
<td>0.004</td>
</tr>
<tr>
<td>Central Texas: Riparian Evergreen Shrubland</td>
<td>0.29</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Totals for Study Area</strong></td>
<td>12,020.01</td>
<td>100.00</td>
</tr>
</tbody>
</table>

* Open water, which is not a vegetation type includes 228 acres or 1.9 % of the study area.

The majority of the project study area is contained within areas defined by the EMST criteria as urban (approximately 74.3 percent, or 8,935 acres). Four additional vegetation types include one or more percent of the study area. These include Blackland Prairie: Disturbance or Tame Grassland at approximately 8.4 percent, Native Invasive: Deciduous Woodland at approximately 6.0 percent, Central Texas: Floodplain Hardwood Forest at approximately 3.0 percent, and row crops at 2.9 percent. The additional twenty vegetation categories all included less than one percent each of the project study area.

According to data obtained from Texas Parks and Wildlife Department’s (TPWD’s) Texas Natural Diversity Database (TXNDD) (TPWD, 2017a), three rare plant series are found within 10 miles of the project area. The Texas oak (*Quercus buckleyi*) series has been reported to occur approximately three miles south of the eastern terminus of the study area. The little bluestem (*Schizachyrium scoparium*)-Indiangrass (*Sorghastrum nutans*), Big Bluestem (*Andropogon gerardii*)-Prairie Bishop Vertisol Grassland series, commonly known as Vertisol Blackland Prairie, has been reported to occur at two areas, approximately 5 and 10 miles north/northwest of the western terminus of the project area. In addition, the little bluestem (*Schizachyrium scoparium*)-Big Bluestem (*Andropogon gerardii*)-Indiangrass (*Sorghastrum nutans*), Prairie Bishop Mollisol Grassland series, commonly known as Mollisol Blackland Prairie, is situated approximately six miles southeast of the central portion of the study area.

The proposed project corridor crosses the communities of Addison, Carrollton, Coppell, Dallas, Grapevine, Plano and Richardson. All of these municipalities have some form of tree protection ordinances in place. Removal or alteration of trees on public property may require a permit from the city in question. Some of these cities also have protection provisions in place for trees on private property. Any tree removals associated with project activities would be done in accordance with city ordinances, and permits would be obtained if necessary.

Field Assessment

Detailed field investigations were performed in March 2013 to assess the specific vegetation types and species occurring within and adjacent to the project corridor and reexamined during
Cotton Belt Corridor Regional Rail Project

Biological Resources Existing Conditions

Field work in May 2017. The field assessment as originally performed in March 2013 was surveyed in three segments (Figure 2-4). Recent field work utilized the same segments as the 2013 survey, comparing the previous surveys photos and descriptions of each segment with current field conditions. In addition, aerial photography obtained from the Texas Natural Resource Information System (TNRIS) from 2012 and 2016 were compared within the project corridor to determine if any significant changes in land use had occurred since the earlier field survey. Analysis of these aerial photos indicated that approximately four percent of the project corridor had been developed since the original field survey had been completed. No significant changes in land use or vegetation type were observed within the project corridor during the 2017 field survey. Representative photos of the project area for each segment are included in Appendix A and their location is shown on Figure 2-7.

Segment A originates in Tarrant County in the City of Grapevine at the Dallas Fort Worth International Airport (DFW) (Figure 2-7). From that point the project corridor continues in a northwest direction to State Highway 26, then continues in a northeast direction within Dallas County, to an area just east of Interstate Highway 35 East in the City of Carrollton (Figure 2-4). Segment B continues from Segment A in a northeast direction ending just east of State Highway 289 in Dallas, Texas and entering Collin County. Segment C continues from Segment B in a northeast direction terminating east of Shiloh Rd. in Plano, Texas (Figure 2-4). In general, the project corridor contains vegetation commonly found in the Northern Blackland Prairie Ecoregion. No crops were observed in the project corridor during the field surveys. The following paragraphs include the 2013 detailed field descriptions of each segment, in addition to any changes which were observed during the 2017 field survey.

Segment A included little or no vegetation management within the right-of-way (ROW) and vegetation within this area was dense. Woody vegetation consisted primarily of hackberry (*Celtis* spp.), honey locust (*Gleditsia triacanthos*) and osage orange (*Maclura pomifera*) along with hawthorne (*Crataegus* spp.), McCartney rose (*Rosa bracteata*), gum bumelia (*Sideroxylon lanuginosum*), willow baccharis (*Baccharis salicina*) and mesquite (*Prosopis glandulosa*). The herbaceous layer was more diverse, containing johnsongrass (*Sorghum halepense*), downy ground cherry (*Physalis grisea*), giant ragweed (*Ambrosia trifida*), greenbrier (*Smilax bona-nox*), poison ivy (*Toxicodendron radicans*), goldenrod (*Solidago* sp.), sunflower (*Helianthus annuus*) and southern dewberry (*Rubus trivialis*). The Elm Fork of the Trinity River located in Segment A was approximately 150 feet wide surrounded by a rocky sloped bank with primarily mature trees (30 to 50 feet in height) of cedar elm (*Ulmus crassifolia*) and hackberry. Segment A photographs are included in Appendix A, photos 1-15.

The portion of Segment A near DFW primarily runs through undeveloped property and included undeveloped fields with a small portion of woodlands near the Cottonwood Branch crossing. Vegetation in these woodlands consisted of mature hackberry, Ashe juniper (*Juniperus ashei*), and honey locust (15 dbh and 15-foot height on average). Vegetation north of the woodland consisted of scattered Ashe juniper (5-foot height on average) with Canada wildrye.
Figure 2-7
DART Cotton Belt Field Survey Segments (2013)
(Elymus canadensis), Panicum spp., and common ragweed (Ambrosia psilostachya). Vegetation south of the woodland included of Roosevelt weed (Baccharis neglecta), Canada wildrye, and common ragweed.

The part of Segment A which occurs northwest of North Lake runs along business/warehouse developments and some undeveloped land associated with Oncor Electric that is simultaneously being used for some agricultural use (i.e. cattle). This portion of the corridor generally had a maintained ROW with the exception of the Oncor parcel and the woodlands associated with the crossing at Grapevine Creek. Vegetation in the woodlands included tall woody species (approximately 40-foot height) such as Texas oak (Quercus Texana), hackberry, American elm, yaupon (Ilex vomitoria), along with some Canada wildrye, ragweed and pigeonberry (Rivina humilis). Vegetation in the Oncor parcel consisted of maintained grasses with some 12-foot tall mesquite.

The eastern portion of the Segment B project area had a well-maintained right-of-way. Although a few trees were noted along the eastern half of the segment, the western half of the segment had a higher density of woody species, similar to those found in Segment A. The creeks and riparian areas of this segment included cottonwood (Populus deltoides), black willow (Salix nigra), and sycamore (Plantanus occidentalis), although hackberry and mesquite were also common. Trees with larger diameter at breast height (dbh) (36 to 72 in.) were also noted along Perry Creek. Segment B photographs are included in Appendix A, photos 16-29.

The western portion of the Segment B corridor generally had an unmaintained ROW. Vegetation in this corridor was similar to Segment A with some larger trees along White Rock Creek. In addition, bamboo (Bambusa vulgaris), poison ivy, greenbrier, osage orange, and some invasive species such as Viburnum spp., chinaberry (Melia azedarach), paper mulberry (Broussonetia papyrifera), King Ranch bluestem (Bothriochloa ischaemum), silver bluestem (Bothriochloa saccharoides), goldenrod, downy ground cherry, smartgrass (Polygonum spp.), needlegrass (Achnatherum spp.), and Texas wintergrass (Nassella leucotricha) were also noted.

The Segment C corridor generally had a maintained ROW. Woody vegetation (generally along the fenceline) consisted primarily of hackberry in addition to eastern red cedar (Juniper virginiana), American elm (Ulmus americana), winged elm (Ulmus alata), cedar elm, gum bumelia, red oaks (Quercus spp.), pecan (Carya illinoinesis), green ash (Fraxinus pennsylvanica), black gum (Nyssa sylvatica) and sweet gum (Liquidambar styraciflua) along the creeks. Few trees with a large diameter at breast height (dbh) were noted along Segment C with the exception of the Pittman Creek/Spring Creek area. Herbaceous species included common bermudagrass (Cynodon dactylon), Johnsongrass, dallisgrass (Paspalum dilatatum), tall dropseed (Sporobolus compositus), frogfruit (Phyla nodiflora), curly dock (Rumex crispus) and common ragweed. Segment C photographs are included in Appendix A, photos 30-43.

The portion of Segment C near the President George Bush Turnpike occurs along a hike-and-bike trail/utility line easement, and includes undeveloped land with some crop use (annual ryegrass (Lolium multiflorum)), woodlands associated with Spring Creek, and some maintained ROW with business/warehouse development. Vegetation along the hike and bike trail consisted of woody species...
Existing Conditions

Vegetation adjacent to Spring Creek consisted of tall woody species (45-foot height) of sycamore, Texas oak, chinaberry, American elm, Texas ash (*Fraxinus texensis*), hackberry, and deciduous holly (*Ilex decidua*), along with herbaceous species of Canada wildrye, common blue violet (*Viola sororia*), wild onion (*Allium spp.*), and ragweed.

**Wildlife**

Approximately 49 species of mammals, 57 species of reptiles, and 23 species of amphibians occur in the Texan Biotic Province (Blair, 1950). In addition, approximately 471 avian species, including both residents and migrants, have been reported in the Oaks and Prairies and Osage Plains of Texas (Freeman, 2003), an area that is roughly analogous to the Texan Biotic Province.

The project area is mostly urban and suburban in nature. The majority of wildlife species inhabiting the project area would be anticipated to be those which are generally associated with these types of areas.

Approximately twenty seven parks are located adjacent or within the proposed project corridor, including Gravley, Keller Springs, Preston Green, R. J. McInnish Park, Grapevine Creek Park, and Grapevine Springs Park. Numerous creek crossings also occur in the project right-of-way. These creeks and undeveloped portions of the parks could provide habitat for various species of wildlife.

The Migratory Bird Treaty Act (MBTA) of 1918 prohibits harm to all migratory birds, their nests, eggs, and nestlings. The Bald and Golden Eagle Protection Act further provides protection for Bald Eagles and Golden Eagles. According to data obtained from TPWD’s TXNDD, one rookery utilized by snowy egrets (*Egretta thula*), little blue herons (*Egretta caerulea*), and cattle egrets (*Bubulcus ibis*) has been reported to occur within the central portion of the project area (TPWD, 2017a). An additional rookery which includes a colonial wading bird colony occurs approximately 5.4 miles southeast of the eastern terminus of the project area.

During the original field investigations several Red-tailed Hawks (*Buteo jamaicensis*), and other raptors, several heron species (*Ardea spp.*), Mallards (*Anas platyrhynchos*), soft-shelled turtles (*Apalone spinifera*), raccoon (*Procyon lotor*) tracks, bobcats (*Lynx rufus*), and several fish and turtle species were observed along the project corridor. No rookeries were noted within or adjacent to the project corridor. Swallow (unknown species) nests were noted under the President George Bush Turnpike.

**Threatened and Endangered Species**

The Endangered Species Act of 1972, as amended, provides protection for federally-listed species and their habitats. Texas state law includes provisions which prohibit direct harm to state-listed species. USFWS’ endangered species list for Tarrant, Dallas, and Collin counties and TPWD’s Annotated County List of Rare Species for Tarrant, Dallas, and Collin counties were examined along with project area information to determine whether the project is likely to have an effect on listed species or their...
habitats. In addition, TPWD’s TXNDD was reviewed to determine previously recorded occurrences of any of the listed species within or near the project area.

Six federally-listed endangered species, two federally-listed threatened species, six state-listed endangered species, fourteen state-listed threatened species, and 20 state species of concern (which are tracked by TPWD for monitoring purposes, but do not currently receive regulatory protection) are listed as having potential to occur in Tarrant, Dallas, or Collin counties (TPWD, 2017b; USFWS, 2017a). Table 2-2 contains a listing of all of these species, along with their habitat descriptions, information about recorded occurrences of the species, and a determination of whether habitat exists within the project area.

<table>
<thead>
<tr>
<th>Species</th>
<th>Federal Status</th>
<th>State Status</th>
<th>Species/Habitat Description</th>
<th>Element of Occurrence Records</th>
<th>Habitat Present?</th>
<th>Other Pertinent Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Peregrine Falcon</td>
<td>DL</td>
<td>T</td>
<td>Resident in west Texas; migrant across the rest of the state from more northern breeding areas; winters along coast and farther south; occupies wide range of habitats during migration, including urban; stopovers at leading landscape edges.</td>
<td>-</td>
<td>No</td>
<td>No impact. Potential migrant through the project area.</td>
</tr>
<tr>
<td>Arctic Peregrine Falcon</td>
<td>DL</td>
<td>SOC</td>
<td>Migrant throughout state; winters along coast and farther south; occupies wide range of habitats during migration, including urban; stopovers at leading landscape edges; similar in appearance to the American subspecies.</td>
<td>-</td>
<td>No</td>
<td>No impact. Potential migrant through the project area.</td>
</tr>
</tbody>
</table>
## Table 2-2

### Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas

<table>
<thead>
<tr>
<th>Species</th>
<th>Federal Status</th>
<th>State Status</th>
<th>Species/ Habitat Description</th>
<th>Element of Occurrence Records¹</th>
<th>Habitat Present?</th>
<th>Other Pertinent Information²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald Eagle</td>
<td>DL T</td>
<td>T</td>
<td>Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts</td>
<td>-</td>
<td>Yes</td>
<td>May impact. Tall trees near rivers are present in project area. Potential migrant through the project area.</td>
</tr>
<tr>
<td>Black-capped Vireo</td>
<td>LE E</td>
<td>E</td>
<td>Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; foliage reaching to ground level for nesting cover; broad-leaved shrubs and trees provide insects for feeding; nesting March-late summer</td>
<td>-</td>
<td>No</td>
<td>No effect. No multi-layered oak-juniper woodlands occur in the project area.</td>
</tr>
<tr>
<td>Golden-cheeked Warbler</td>
<td>LE E</td>
<td>E</td>
<td>Juniper-oak woodlands; dependent on Ashe Juniper (Juniperus ashei) for long, fine bark strips from mature trees, used in nest construction; nests placed in various trees; forage for insects in broad-leaved trees and shrubs; nesting late March-early summer.</td>
<td>-</td>
<td>Yes</td>
<td>No effect. Mature juniper-oak woodlands occur in the project area. However, these woodlands occur in small patches and would not be conducive for travel corridors and make the occurrence unlikely.</td>
</tr>
</tbody>
</table>
### Table 2-2

**Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas**

<table>
<thead>
<tr>
<th>Species</th>
<th>Federal Status</th>
<th>State Status</th>
<th>Species/Habitat Description</th>
<th>Element of Occurrence Records</th>
<th>Habitat Present?</th>
<th>Other Pertinent Information²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henslow’s Sparrow Ammodramus henslowii</td>
<td>NL</td>
<td>SOC</td>
<td>Wintering individuals found in weedy fields or cut-over areas where bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking</td>
<td>-</td>
<td>No</td>
<td>No impact. No fields with bunch grasses and bare ground occur in the project area.</td>
</tr>
<tr>
<td>Interior Least Tern Sterna antillarum athalassos</td>
<td>LE</td>
<td>E</td>
<td>Subspecies listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also known to nest on man-made structures</td>
<td>-</td>
<td>No</td>
<td>No effect. No sand or gravel bars in braided streams or rivers occur in the project area.</td>
</tr>
<tr>
<td>Peregrine Falcon Falco peregrinus</td>
<td>DL</td>
<td>T</td>
<td>Both subspecies migrate across the state from more northern breeding areas to winter along coast and farther south.</td>
<td>--</td>
<td>No</td>
<td>Potential migrant, but no breeding or wintering habitat within study area.</td>
</tr>
<tr>
<td>Piping Plover Charadrius melodus</td>
<td>LT</td>
<td>T</td>
<td>Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats</td>
<td>-</td>
<td>No</td>
<td>Potential migrant, but no breeding or wintering habitat within study area.</td>
</tr>
<tr>
<td>Red Knot Calidris canutus rufa</td>
<td>LT</td>
<td>SOC</td>
<td>Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters.</td>
<td>-</td>
<td>No</td>
<td>Potential migrant, but no breeding or wintering habitat within study area.</td>
</tr>
</tbody>
</table>
Table 2-2
Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas

<table>
<thead>
<tr>
<th>Species</th>
<th>Federal Status</th>
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<th>Element of Occurrence Records¹</th>
<th>Habitat Present?</th>
<th>Other Pertinent Information²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprague’s Pipit <em>Anthus spragueii</em></td>
<td>NL</td>
<td>SOC</td>
<td>Only in Texas mid-September to early April; strongly tied to native upland prairie, can be locally common in coastal grasslands; sensitive to patch size and avoids edges</td>
<td>-</td>
<td>No</td>
<td>No impact. No upland prairie occurs in project area.</td>
</tr>
<tr>
<td>Western Burrowing Owl <em>Athene cunicularia hypugaea</em></td>
<td>NL</td>
<td>SOC</td>
<td>Open grasslands, especially prairie, plains, and savannah; vacant lots near human habitation or airports; nests and roosts in abandoned burrows</td>
<td>-</td>
<td>No</td>
<td>No impact. No burrows observed in project area.</td>
</tr>
<tr>
<td>White-faced Ibis <em>Plegadis chihi</em></td>
<td>NL</td>
<td>T</td>
<td>Prefers freshwater marshes, sloughs, and irrigated rice fields; nests in marshes</td>
<td>-</td>
<td>Yes</td>
<td>May impact. Freshwater marsh habitat exists within 2,000-ft of project area. Incidental occurrences of this species are possible in the project area.</td>
</tr>
<tr>
<td>Whooping Crane <em>Grus americana</em></td>
<td>LE</td>
<td>E</td>
<td>Potential migrant via plains throughout most of state to coast; winters in coastal marshes</td>
<td>-</td>
<td>No</td>
<td>No effect. Potential migrant through the project area.</td>
</tr>
<tr>
<td>Wood Stork <em>Mycteria americana</em></td>
<td>NL</td>
<td>T</td>
<td>Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water; usually roosts communally in tall snags; breeds in Mexico; formerly nested in Texas, but no breeding records since 1960</td>
<td>-</td>
<td>Yes</td>
<td>May impact. Flooded ditches and shallow standing water occurs in the project area.</td>
</tr>
<tr>
<td>Species</td>
<td>Federal Status</td>
<td>State Status</td>
<td>Species/Habitat Description</td>
<td>Element of Occurrence Records¹</td>
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</tr>
<tr>
<td><strong>Fishes</strong></td>
<td></td>
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</tr>
<tr>
<td>Shovelnose sturgeon</td>
<td>NL T</td>
<td></td>
<td>Open, flowing channels with sand or gravel substrate; spawns over gravel or rocks in area</td>
<td>-</td>
<td>No</td>
<td>No impact. Project is not</td>
</tr>
<tr>
<td><em>Scaphirhynchus platorynchus</em></td>
<td></td>
<td></td>
<td>with fast current; Red River below reservoir and rare occurrence in Rio Grande</td>
<td></td>
<td></td>
<td>located in Red River or Rio</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grande basins.</td>
</tr>
<tr>
<td><strong>Insects</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Lordithon rove beetle</td>
<td>NL SOC</td>
<td></td>
<td>Historically known from Texas; very little known</td>
<td>-</td>
<td>No</td>
<td>No impact. The species is</td>
</tr>
<tr>
<td><em>Lordithon niger</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>extirpated from Texas.</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cave myotis bat</td>
<td>NL SOC</td>
<td></td>
<td>Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under</td>
<td>-</td>
<td>No</td>
<td>No impact. No solid bridges</td>
</tr>
<tr>
<td><em>Myotis velifer</em></td>
<td></td>
<td></td>
<td>bridges, or in abandoned Cliff Swallow (<em>Hirundo pyrrhonota</em>) nests; roosts in large groups</td>
<td></td>
<td></td>
<td>occur in project area. Also,</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>no swallow nests noted during</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>field investigation.</td>
</tr>
</tbody>
</table>

¹Element of Occurrence Records
²Other Pertinent Information
### Table 2-2

**Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas**

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</tr>
</thead>
<tbody>
<tr>
<td>Gray wolf <em>Canis lupus</em></td>
<td>LE E</td>
<td>E</td>
<td>Extirpated; formerly known throughout western 2/3 of state in forests, brushlands, or grasslands</td>
<td>-</td>
<td>No</td>
<td>No effect. The species is extirpated and would not occur within study area.</td>
</tr>
<tr>
<td>Plains spotted skunk <em>Spilogale putorius interrupta</em></td>
<td>NL SOC</td>
<td>Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie</td>
<td>-</td>
<td>Yes</td>
<td>May impact. Fence rows, forest edges, woodlands, and wooded, brushy areas occur in project area.</td>
<td></td>
</tr>
<tr>
<td>Red wolf <em>Canis rufus</em></td>
<td>LE E</td>
<td>E</td>
<td>Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas and coastal prairies</td>
<td>-</td>
<td>No</td>
<td>No effect. The species is extirpated and would not occur within study area.</td>
</tr>
</tbody>
</table>

**Mollusks**
## Table 2-2

**Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas**

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</thead>
<tbody>
<tr>
<td>Louisiana pigtoe&lt;br&gt;<em>Pleurobema riddellii</em></td>
<td>NL</td>
<td>T</td>
<td>Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; historically known from Trinity River basin</td>
<td>EO ID 9969 – approximately 4.6 miles south of the project area</td>
<td>Yes</td>
<td>May impact. Project crosses several small and large rivers. Most bridges over rivers will need to be replaced however, use of Best Management Practices (BMPs) would avoid or minimize water quality impacts to the river, thus avoiding impacts to the species.</td>
</tr>
<tr>
<td>Sandbank pocketbook&lt;br&gt;<em>Lampsilis sativa</em></td>
<td>NL</td>
<td>T</td>
<td>Small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms. Found in east Texas from Sulfur south through San Jacinto River basins and Neches River.</td>
<td>EO ID 9771 – approximately 4.6 miles south of the project area</td>
<td>Yes</td>
<td>May impact. Project crosses several small and large rivers. Most bridges over rivers will need to be replaced however, use of BMPs would avoid or minimize water quality impacts to the river, thus avoiding impacts to the species.</td>
</tr>
<tr>
<td>Texas heelsplitter&lt;br&gt;<em>Potamilus amphichaenus</em></td>
<td>NL</td>
<td>T</td>
<td>Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.</td>
<td>EO ID 9883, – approximately 6.6 miles north of the project area; EO ID 9884 – 0.7 miles north of the project area</td>
<td>Yes</td>
<td>May impact. Project crosses several small and large rivers. Most bridges over rivers will need to be replaced however, use of BMPs would avoid or minimize water quality impacts to the river, thus avoiding impacts to the species.</td>
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### Table 2-2

**Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas**

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</tr>
</thead>
<tbody>
<tr>
<td>Texas pigtoe <strong>Fusconaia askewi</strong></td>
<td>NL</td>
<td>T</td>
<td>Rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures</td>
<td>--</td>
<td>Yes</td>
<td>May impact. Project crosses several small and large rivers. Most bridges over rivers will need to be replaced however, use of BMPs would avoid or minimize water quality impacts to the river, thus avoiding impacts to the species.</td>
</tr>
</tbody>
</table>

**Plants**

<table>
<thead>
<tr>
<th>Plants</th>
<th>Federal Status</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Auriculate false foxglove <strong>Agalinis auriculata</strong></td>
<td>NL</td>
<td>SOC</td>
<td>Known in Texas from one late nineteenth century specimen record labeled - Benbrook; in Oklahoma, degraded prairies, floodplains, fallow fields, and borders of upland sterile woods; in Arkansas, blackland prairie; Annual; Flowering August - October</td>
<td>--</td>
<td>No</td>
<td>No impact.</td>
</tr>
<tr>
<td>Species</td>
<td>Federal Status</td>
<td>State Status</td>
<td>Species/ Habitat Description</td>
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</tr>
</tbody>
</table>
| Glass Mountains coral-root  
*Hexalectris nitida* | NL | SOC | Rare in canyons in Brewster County, encountered more commonly under *Juniperus ashei* in woodlands over limestone on the Edwards Plateau, Callahan Divide, and Lampasas Cutplain. Flowering June-September; fruiting July-September | -- | No | No impact. |
| Glen Rose yucca  
*Yucca necopina* | NL | SOC | Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June | -- | No | No impact. No grasslands on sandy soils or limestone outcrops occur within the project study area. |
| Hall’s prairie clover  
*Dalea hallii* | NL | SOC | In grasslands on eroded limestone or chalk and in oak scrub on rocky hillside; perennial; flowers May-Sept, fruiting June-September | -- | No | No impact. |
| Osage Plains false foxglove  
*Agalinis densiflora* | NL | SOC | Mostly grasslands on shallow, gravelly, well-drained, calcareous soils; prairies, dry limestone soils. Annual, flowering August-October | -- | No | No impact. |
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Plateau milkvine Matelea edwardsensis</td>
<td>NL</td>
<td>SOC</td>
<td>Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; flowering March-October; fruiting August-October</td>
<td>--</td>
<td>No</td>
<td>No impact.</td>
</tr>
<tr>
<td>Reverchon’s curfpea Pediomelum reverchonii</td>
<td>NL</td>
<td>SOC</td>
<td>Mostly in prairies on shallow rocky calcareous substrate and limestone outcrops. Perennial; flowering June-September; fruiting June-July</td>
<td>--</td>
<td>No</td>
<td>No impact.</td>
</tr>
<tr>
<td>Texas milk vetch Astragalus reflexus</td>
<td>NL</td>
<td>SOC</td>
<td>Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; flowering February-June; fruiting April-June</td>
<td>--</td>
<td>No</td>
<td>No impact.</td>
</tr>
<tr>
<td>Topeka purple-coneflower Echinacea atrorubens</td>
<td>NL</td>
<td>SOC</td>
<td>Occurring in mostly tallgrass prairie.</td>
<td>--</td>
<td>No</td>
<td>No impact.</td>
</tr>
<tr>
<td>Tree dodder Cuscuta exaltata</td>
<td>NL</td>
<td>SOC</td>
<td>Parasitic on various Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros species as well as Acacia berlandieri and other woody plants; Annual; Flowering May-Oct; Fruitimg July-Oct</td>
<td>--</td>
<td>No</td>
<td>No impact.</td>
</tr>
</tbody>
</table>
Table 2-2

**Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas**

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<thead>
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<th>Habitat Present?</th>
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</tr>
</thead>
</table>
| Warnock’s coral-root  
*Hexalectris warnockii* | NL | SOC | In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creek beds in canyons; flowering June-September; individual plants do not usually bloom in successive years | - | No | No impact. No woodlands on slopes or canyons occur within study area. |
| **Reptiles** | | | | | | |
| Alligator snapping turtle  
*Macrochelys temminckii* | NL | T | Perennial water bodies; deep water of rivers, canals, lakes, oxbows; swamps, bayous, ponds near deep running water; prefers mud substrate and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October | - | Yes | May impact. Project crosses several small and large rivers. Most bridges over rivers will need to be replaced. However, use of BMPs would avoid or minimize water quality impacts to the river, thus avoiding impacts to the species. |
| Texas garter snake  
*Thamnophis sirtalis annectens* | NL | SOC | Wet or moist microhabitats are conducive to species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August | EO ID 434 – approximately 7 miles north of study area | Yes | May impact. Project crosses several rivers and moist habitats. Most bridges over rivers will need to be replaced. However, use of BMPs would avoid or minimize water quality impacts to the river, thus avoiding impacts to the species. |
Table 2-2

Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin counties, Texas

<table>
<thead>
<tr>
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<th>Habitat Present?</th>
<th>Other Pertinent Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas horned lizard</td>
<td>NL</td>
<td>T</td>
<td>Open, arid and semi-arid regions with sparse vegetation; soil varies in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September</td>
<td>-</td>
<td>No</td>
<td>No impact. No arid/semi-arid areas with sparse vegetation occur within the project area.</td>
</tr>
<tr>
<td><em>Phrynosoma cornutum</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timber rattlesnake</td>
<td>NL</td>
<td>T</td>
<td>Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover</td>
<td>-</td>
<td>Yes</td>
<td>May impact. Riparian woodland vegetation with dense ground cover is present in the project area.</td>
</tr>
<tr>
<td><em>Crotalus horridus</em></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

LE = Federally Endangered
DL = Delisted
LT = Federally Threatened
SOC = Species of concern
NL = Not Federally Listed
E = State Endangered
T = State Threatened
SOC = State Species of concern

1Includes all TXNDD Element of Occurrence Records within a 10-mile radius of the project area.
2Federally-listed species are discussed in terms of “effects”, while state-listed species and species of concern are discussed in terms of “impacts”. Species could be affected/impacted by the project if individuals of the species or habitat for the species occurs within the project study area.

None of the species listed above were observed during project field visits; however, potential habitat was identified for 9 state-listed threatened or endangered species, and 2 state species of concern as included in Table 2-2.

Federally-listed species and their habitats are protected under the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended. No designated critical habitat or preferred habitat for any federally-listed species was identified within or near the project study area, therefore the proposed project will have no effect on federally-listed species for Tarrant, Dallas or Collin counties.

Fourteen state-listed threatened species could occur in the project area. These include the American peregrine falcon (*Falco peregrinus anatum*), peregrine falcon (*Falco peregrinus*), piping plover (*Charadrius melodus*), alligator snapping turtle (*Macrochelys temminckii*), Texas horned lizard (*Phrynosoma cornutum*), timber rattlesnake (*Crotalus horridus*), bald eagle (*Haliaeetus leucocephalus*),
white-faced Ibis \textit{(Plegadis chihi)}, wood stork \textit{(Mycteria Americana)}, shovelnose sturgeon \textit{(Scaphirhynchus platyrynchus)}, Louisiana pigtoe \textit{(Pleurobema riddellii)}, sandbank pocketbook \textit{(Lampsilis satura)}, Texas pigtoe \textit{(Fusconaia askewi)} and Texas heelsplitter \textit{(Potamilus amphichaenus)}. The Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter, all have recorded TXNDD element of occurrences within 0.7 – 7 miles from the project area. The project may impact these state-listed species if they are present within the project area.

Twenty state-listed species of concern could occur within the project area counties, however only one of these, the Texas garter snake \textit{(Thamnophis sirtalis annectens)} has a TXNDD element of occurrence record located approximately 7 miles north of the project area.

Most of the existing bridges over rivers or streams within the project area will need to be replaced which may impact water species. However, the use of BMPs would avoid or minimize water quality impacts, thus avoiding impacts to these species.

State law prohibits direct harm for state-listed species, but does not currently provide for habitat protection. If any individuals of state-listed species are encountered within the project area during construction, care should be taken to avoid harming them.

Several swallow (unknown species) nests were identified under the President George Bush Turnpike. Although these species aren't listed as threatened or endangered, they would fall under the protection of the MBTA, and any work done in this area would need to be avoided during nesting season.

A discussion of the likelihood for each species listed in Table 2-2 to occur within the project study area is found in the following paragraphs.

**Federally Listed Endangered**

**Black-Capped Vireo \textit{(Vireo atricapilla)}**

The Black-capped Vireo is a small songbird that once ranged from Kansas south into Mexico but is now found primarily in Texas and Mexico with a restricted range in Oklahoma (Campbell, 1995). Habitat for the species consists of oak-juniper woodlands that have a distinct structure with tree and shrub layers occurring in a patchy mosaic with grasslands. Dense shrub vegetation reaching to ground level is required for nesting cover (Campbell, 1995). Black-capped Vireos arrive in Texas in mid-March and nesting takes place through late summer; the birds tend to return to the same nesting territory or one nearby each year.

No reported occurrences of this species are included in the most recent TXNDD data set. In addition, no multi-layered oak-juniper woodlands were noted in the project area during field investigations. Due to the urban nature of the study area and the lack of potential habitat, the occurrence of this species is unlikely.

**Golden-Cheeked Warbler \textit{(Setophaga chrysoparia)}**
The Golden-cheeked Warbler is a small songbird that breeds in central Texas and winters in central America (Campbell, 1995). It inhabits woodlands comprised of mature Ashe juniper (*Juniperus ashei*) mixed with oaks and a variety of other hardwood species, preferring steep-sided canyons and slopes above drainages. The long, fine bark strips from mature, shredding Ashe juniper trees are used for nest construction and cemented in place with spider webs (Campbell, 1995). Nesting takes place from March to early summer.

No reported occurrences of this species are included in the most recent TXNDD data set. Small tracts of mature juniper-oak woodlands were noted in the project area during field investigations. However, these woodlands occur in small patches (approximately 14 acres in size) in an urban setting and would not be conducive to species utilization. No potential habitat for the species occurs in the study corridor.

**Interior Least Tern (*Sterna antillarum athalassos*)**

The Interior Least Tern is a shorebird that is considered listed only when inland (i.e., more than 50 miles from the coastline where it breeds) (Campbell, 1995). The species nests on sand and gravel bars within braided streams and rivers and is also known to nest on man-made structures, such as sand and gravel mines, water treatment plants, ash disposal areas at power plants, and inland beaches such as those at reservoirs (Campbell, 1995). They prefer open areas, and tend to avoid habitats with thick vegetation or narrow beaches. Breeding takes place from early April to late August (Campbell, 1995).

No reported occurrences of this species are included in the most recent TXNDD data set and no potential habitat for the Interior Least Tern was noted during field investigations.

**Whooping Crane (*Grus americana*)**

The Whooping Crane breeds in the wetlands of northern Canada and spends the winter on the Texas coast near Rockport (TPWD, 2017c). Whooping cranes migrate to Texas’ coastal plains from November through March, passing through the central portion of the state from the eastern panhandle to the Dallas area and south through the Austin area. During migration, whooping cranes utilize a variety of habitats, including wetland mosaics, riverine complexes, prairies, and croplands. Croplands are utilized for feeding, while open wetland areas are preferred for roosting (Campbell, 1995). Isolated areas away from human disturbance are generally preferred. The nearest known major migration stops to Whooping Crane wintering grounds in the Aransas National Wildlife Refuge are at the Salt Plains National Wildlife Refuge in northern Oklahoma (ICF, 2017). As of February 2015, the total wild population of the species was estimated to be 442 individuals, and the combined wild and captive population was estimated to be 603 individuals (USFWS, 2017b).

No reported occurrences of this species are included in the most recent TXNDD data set. The project area is located within the migratory path of the whooping crane, and there is a possibility that the species could migrate through the project area; however, such occurrence would be considered incidental because the species’ preferred wetland roosting habitat is not present within the project area.
Gray wolf (Canis lupus)

This species was formerly known throughout the western two-thirds of Texas in forests, brushlands, and grasslands; however, the last documented gray wolves in Texas were killed in 1970 and the species is considered extinct in the state (Schmidly, 2004).

No reported occurrences of this species are included in the most recent TXNDD data set. The gray wolf would not occur within the project area because it is extirpated in Texas.

Red wolf (Canis rufus)

The red wolf was formerly known throughout the eastern half of Texas in brushy and forested areas and in coastal prairies (Schmidly, 2004); however, this species has been extinct in the wild in Texas since the early to mid-1970s, having succumbed to hunting pressure and genetic suppression due to hybridization with coyotes.

No reported occurrences of this species are included in the most recent TXNDD data set. The red wolf would not occur within the project area because it is extirpated in Texas.

Federally Listed Threatened Species

Piping Plover (Charadrius melodus)

The Piping Plover is a small shorebird that nests in the Great Plains and Great Lakes regions of the U.S. and winters along the Texas Gulf Coast (Campbell, 1995). Wintering Piping Plovers prefer sparsely-vegetated tidal mudflats, sandflats, and algal flats; however they also feed and roost on beaches.

No reported occurrences of this species are included in the most recent TXNDD data set. The Piping Plover could migrate through the project area on its way to or from its wintering grounds on the Texas Gulf Coast; however, because appropriate habitat for the species does not occur within the project area, any occurrence would be considered incidental.

Red Knot (Calidris canutus rufa)

The Red Knot is a medium-sized shorebird that migrates annually between its breeding grounds in the Canadian Artic to the southeast U.S. and Gulf of Mexico, and places further south including Brazil (USFWS, 2014). Wintering Red Knots prefer intertidal, marine habitats, especially near coastal inlets, estuaries and bays (AAB, 2017a).

No reported occurrences of this species are included in the most recent TXNDD data set. The Red Knot could migrate through the project area on its way to or from its wintering grounds on the Texas Gulf Coast, or areas further south; however, because appropriate habitat for the species does not occur within the project area, any occurrence would be considered incidental.

Federal Candidate Species

No federal candidate species are listed for the counties encompassing the Cotton Belt corridor.
State Listed Endangered Species

All state-listed endangered species listed within the counties encompassing the Cotton Belt corridor are also federally listed and have been discussed previously.

State Listed Threatened Species

American Peregrine Falcon (*Falco peregrinus anatum*)

The American peregrine falcon nests in the northern U.S. and Canada and in the Trans-Pecos region of west Texas; elsewhere in Texas, the species is considered a migrant (Campbell, 1995). Migrating falcons winter along the Texas Gulf Coast, with stopovers in various habitat types at leading landscape edges. Formerly federally-listed as endangered, the species was delisted by the USFWS on August 25, 1999 (USFWS, 1999).

No reported occurrences of this species are included in the most recent TXNDD data set. The American peregrine falcon could migrate through the project area; however, because appropriate habitat for the species does not occur within the project area, any occurrence would be considered incidental.

Bald Eagle (*Haliaeetus leucocephalus*)

The Bald Eagle was formerly federally-listed as threatened but was delisted on August 9, 2007 (USFWS, 20117c). The species is a large bird of prey that migrates through, breeds, and winters in various parts of Texas. In Texas, nesting habitat consists of undisturbed coastal regions or along rivers and lake shores with large, tall trees, in which the birds nest and roost (Campbell, 1995). Wintering eagles are generally found near large lakes and reservoirs, and roosting often takes place communally in large trees. According to Campbell (1995), Tarrant, Dallas and Collin Counties are not part of the usual breeding range of the Bald Eagle; however, the species winters in nearby counties.

No reported occurrences of this species are included in the most recent TXNDD data set. The Bald Eagle could migrate through the project area; in addition, tall trees near rivers are present in the project area (along Elm Fork of the Trinity River, and Grapevine Creek) as noted during field investigations. Its presence in an urban setting would be as an incidental migrant.

Peregrine Falcon (*Falco peregrinus*)

The peregrine falcon includes two subspecies which migrate across the state from more northern breeding areas in the U.S. and Canada to winter along the coast and farther south (USFWS, 2017d). The American peregrine falcon (*Falco peregrinus anatum*) is a resident breeder in west Texas. Because the two subspecies are not easily distinguishable at a distance reference is generally made only to the species level.

No reported occurrences of either of the subspecies are included in the most recent TXNDD data set. Either subspecies could migrate through the project area; however, because appropriate habitat for the species does not occur within the project area, any occurrence would be considered incidental.
**Piping plover (Charadrius melodus)**

The piping plover is also listed as federally threatened and has been previously discussed in the previous section.

**White-faced Ibis (Plegadis chihi)**

The White-faced Ibis is a wading bird that breeds and winters along the Texas Gulf Coast; in west and northwest Texas, the species may occur as a migrant (TPWD, 2011e). Freshwater marshes are the preferred habitat type (TPWD, 2017d), although they will also utilize sloughs, irrigated rice fields, and brackish or saltwater habitats. They nest colonially, constructing nests in marshes with shallow water in low trees, on the ground in bulrushes or reeds, or on floating mats (TPWD, 2017d).

No reported occurrences of this species are included in the most recent TXNDD data set. However, it is possible that the species could migrate through the project area, in which case the occurrence would be considered incidental. NWI maps show several emergent wetlands adjacent to the project area which may be utilized by this species, especially near the Elm Fork of the Trinity River.

**Wood Stork (Mycteria americana)**

The Wood Stork forages in shallow standing water of various types, including saltwater (TPWD, 2011c). This species roosts in active heronries. At one time wood storks were reported to have nested in Texas, but there have not been any breeding records from Texas since 1960; currently, it is assumed the species breeds in Mexico (USFWS, 2017e).

No reported occurrences of this species are included in the most recent TXNDD data set. However, it is possible that the species could migrate through the project area, in which case the occurrence would be considered incidental. Flooded ditches and shallow standing water which this species may utilize occurs in the project area, as noted during field investigations.

**Shovelnose sturgeon (Scaphirhinchus platorynchus)**

The shovelnose sturgeon is a long, slender fish with rows of spiny scales along its back (Klym and Garrett, 2002). The species generally weighs less than five pounds, and is a bottom feeder that inhabits open, flowing channels with a sand or gravel substrate, spawning over gravel or rocks in areas with fast current (USFWS, 2017f). In Texas, the shovelnose sturgeon is known only from the Red River below the Lake Texoma reservoir and from uncommon occurrences in the Rio Grande.

The project area is not located within the Red River or Rio Grande basins; therefore, occurrence of this species is not anticipated. No reported occurrences of this species are included in the most recent TXNDD data set.
**Louisiana pigtoe (Pleurobema riddellii)**

The Louisiana pigtoe, a freshwater mussel, is endemic to the San Jacinto, Trinity, Neches-Angelina, Sabine, Big Cypress and Sulphur River basins in Texas (TPWD, 2017e). This species occurs in streams and moderate-sized rivers with low to moderate flow. They occur on substrates of sand, silty sand, sand and gravel, and sand and clay. (TPWD, 2017e).

Reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. It is possible that the Louisiana pigtoe could inhabit project area streams.

**Sandbank pocketbook (Lampsilis satura)**

The sandbank pocketbook is a freshwater mussel that lives in creeks, medium, and large-sized rivers with moderate flows (NatureServe, 2017a). This mussel is typically found on gravel, gravel-sand and sandy bottoms (NatureServe, 2017a). The sandbank pocketbook has been found within Arkansas, Louisiana, Mississippi, and Texas; and has been recorded in Dallas County.

Reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. It is possible that the sandbank pocketbook could inhabit project area streams.

**Texas heelsplitter (Potamilus amphichaenus)**

The Texas heelsplitter is a unionid bivalve mussel. Although currently listed as threatened at the state level, the species is under review by USFWS for possible federal listing (USFWS, 2009). The Texas heelsplitter is restricted to the Neches, Trinity, and Sabine Rivers in Texas (TPWD, 2009). In small to medium rivers, the species inhabits flowing waters over mud or sand substrates (USFWS, 2009). It may also be found in reservoirs.

Reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. It is possible that the Texas heelsplitter could inhabit project area streams.

**Texas pigtoe (Fusconaia askewi)**

The Texas pigtoe is a freshwater mollusk normally found in rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures (TPWD, 2009). They are found in east Texas River basins, the Sulphur River, Cypress Creek, and Sabine through Trinity Rivers as well as the San Jacinto River. A regional endemic limited to a relatively small area in Texas and Louisiana, including the Trinity River above Lake Livingston, a tributary of the West Branch San Jacinto River, and the Sabine River above Toledo Bend Reservoir.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. However it is possible that the Texas pigtoe could occur within project area streams.
Alligator snapping turtle (*Macrochelys temmincki*)

The alligator snapping turtle is normally found in perennial water bodies, such as the deep waters of rivers, canals, lakes, and oxbows, but may also inhabit swamps, bayous, and ponds near deep running water (NWF, 2017). Sometimes this turtle may also be found in brackish coastal waters. The species prefers water bodies with mud substrates and abundant aquatic vegetation and is capable of migrating for several miles along rivers. The alligator snapping turtle breeds from April to October.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. Perennial creeks and rivers found within the project area could provide habitat for the alligator snapping turtle.

Texas Horned Lizard (*Phrynosoma cornutum*)

The Texas horned lizard prefers open, arid and semi-arid habitats with sparse vegetation, including grass and cactus (TPWD, 2017f). This species is commonly found on loose soils which may vary in texture from sandy to rocky, and they are known to burrow, enter rodent burrows or hide under rocks. The breeding season for the species is March through September (TPWD, 2017f).

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. No arid/semi-arid areas with sparse vegetation within the project area were noted during field investigations.

Timber rattlesnake (*Crotalus horridus*)

Timber rattlesnakes are found throughout east Texas (TPWD, 2011g) in swamps, floodplains, upland pine and deciduous woodlands, riparian zones, and abandoned farmland. They prefer moist areas with thickets, tree stumps, logs and branches that can provide hiding places (TPWD, 2011g). Timber rattlesnakes may be found on limestone bluffs, sandy soils, or black clay soils. They are diurnal during spring and fall, but tend to become nocturnal in the summer in order to avoid the heat.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set, however the timber rattlesnake could occur within the project area. The highest likelihood for occurrence of the species would be in riparian woodlands and floodplains associated with perennial creeks.

State Species of Concern

Auriculate False Foxglove (*Agalinis auriculata*)

Only known in Texas from one late nineteenth century specimen (Poole et. al., 2007). More commonly found in Oklahoma and Arkansas on blackland prairie. Anecdotal evidence suggests that periodic fire, pocket gopher activity, or other natural disturbance may be required to maintain habitat in an appropriate successional state (Poole et. al., 2007).
No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. Rarity of this species makes it unlikely to occur within the project study area.

**Glass Mountains Coral-Root (Hexalectris nitida)**

The Glass Mountain coral-root is a leafless orchid with a relatively short inflorescence that is widely scattered across Texas. Glass Mountain coral-root is self-pollinating and grows on rocky canyon side and bottoms in moderate to heavily shaded areas. (NAOCC, 2017).

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. Preferred habitat for this species does not occur within the project study area.

**Glen Rose Yucca (Yucca necopina)**

The Glen Rose yucca is an endemic stemless, colony-forming shrub with white flowers which are suspended from a single, tall stalk that grows from the center of the plant (Poole, et al., 2007). The species grows in grasslands on sandy soils and limestone outcrops and flowers from April to June (Poole, et al., 2007). The Glen Rose yucca is known only from north-central Texas. Historically, the species was known from Dallas, Denton, and Young Counties, but it is currently own known to occur in Hood, Parker, Somervell, and Tarrant Counties.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. No suitable grasslands were noted for the Glen Rose yucca during field investigations.

**Hall’s Prairie Clover (Dalea hallii)**

Hall’s prairie clover is endemic to 18 counties in central and north-central Texas. The species is rare and many of the sightings of this prairie clover are historical (the plants have not been seen in 50 years or more) and may be known from only one location in each county. Prairie clovers are indicators of healthy grasslands and savannahs. Hall’s prairie clover, and others in this genus, are threatened by invasion of woody species due to fire suppression. (Singhurst, 2015).

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. The rarity of this species makes it unlikely to occur within the project study area.

**Osage Plains False Foxglove (Agalinis densiflora)**

Osage Plains false foxglove is an herbaceous perennial ranging from Kansas through Oklahoma and north-central Texas (NatureServe, 2017b). This species primarily occurs on shallow, well-drained, gravelly calcareous soils over limestone, in upland tallgrass prairies.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. No areas of upland tallgrass prairies occurs within the project study area.
Plateau Milkvine (*Matelea edwardsensis*)

The plateau milkvine is unusual as it does not demonstrate fidelity to any habitat in which it is locally common (NatureServe, 2017c). It seems to occur in small numbers over a variety of habitats.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. The uncommon occurrence of this species makes it unlikely to occur within the project study area.

Reverchon’s Scurfpea (*Pediomelum reverchonii*)

Reverchon’s scurfpea is a regional plant endemic to the limestone outcrops in Texas and Oklahoma (NatureServe, 2017d). It’s considered to be possibly extirpated in the Lake Texoma watershed of Texas.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. The uncommon occurrence of this species makes it unlikely to occur within the project study area.

Texas Milk Vetch (*Astragalus reflexus*)

Texas milk vetch is a small annual herbaceous plant with tiny flowers. This species is endemic to the eastern half of Texas, primarily within the blackland prairie (NatureServe, 2017e). Most commonly, Texas milk vetch occurs in early-successional habitat on calcareous clay substrates. This species is represented by fewer than 30 collections, of which none are more recent than 1965 (NatureServe, 2017e)

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. The uncommon occurrence of this species makes it unlikely to occur within the project study area.

Topeka Purple-Coneflower (*Echinacea atroruens*)

The Topeka purple-coneflower is an herbaceous perennial, which blooms from April to June (LBJ, 2017). Range for this species includes Kansas, Oklahoma and Texas. This aster prefers sunny, dry sites and occurs on rocky prairies and tall grass hay fields. The Topeka purple-coneflower also occurs on prairie remnants along roadsides.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. However, undisturbed areas within the project study area could provide suitable habitat for the Topeka purple-coneflower.

Tree Dodder (*Cuscuta exaltata*)

Tree dodder is an herbaceous annual, which is found in Texas and Florida (NatureServe, 2017f). This species is a twining parasitic vine, with long, orange, thick stems. In Texas, this species is usually found in
riverside thickets and woodlands, usually in limestone soil. Cuscuta exaltata can form dense tangles in
trees.

No reported occurrences of this species within ten miles of the project area are included in the most
recent TXNDD data set. Tree dodder could occur within thickets or woodlands, especially along rivers,
within the project study area.

**Warnock’s Coral-Root** (*Hexalectris warnockii*)

Warnock’s coral root is a species of orchid that grows in leaf litter and humus on shaded slopes within
oak-juniper woodlands and also may grow in intermittent, rocky creekbeds in canyons (Poole, et al.,
2007). On the White Rock Escarpment of Dallas County, Warnock’s coral-root generally occurs in
woodlands on limestone slopes, often in association with Texas oak (*Quercus buckleyi*) and Ashe juniper
(Poole, et al., 2007). The plant grows to a height of 5 to 15 inches and has a few short tubular sheaths
rather than leaves. The flowers are maroon to reddish or brownish-purple in color (Poole, et al., 2007).
The species flowers from June to September and individual plants usually do not bloom in successive
years (Poole, et al., 2007).

No reported occurrences of this species within ten miles of the project area are included in the most
recent TXNDD data set. No preferred habitat for this species occurs within the project study area.

**Black Lordithon Rove Beetle** (*Lordithon niger*)

In the past, the Black Lordithon rove beetle was considered historically global, although currently its
known or suspected range includes only 16 states in the U.S. and one Canadian province (NatureServe,
2017g). The status for this species is based upon the fact that very little is known about the species or its
habitat requirements.

No reported occurrences of this species within ten miles of the project area are included in the most
recent TXNDD data set. This species is believed to be extirpated from Texas.

**Texas Garter Snake** (*Thamnophis sirtalis annectens*)

The Texas garter snake is fairly common in a few locales, throughout most of its East Central Texas
range, although it is seldom encountered (Tennant, 1985). An active diurnal forager, this snake will
attempt to eat prey of a much larger size.

The Texas garter snake has been reported in the most recent TXNDD data set as occurring
approximately 7 miles north of project study area. The Texas garter snake could occur within the project
area. The highest likelihood for occurrence of the species would be in riparian areas and floodplains
associated with creeks.

**Arctic Peregrine Falcon** (*Falco peregrinus tundrius*)

The Arctic Peregrine Falcon nests in the northern U.S. and Canada and in South America (Campbell,
1995). Migrating falcons stop along the Texas Gulf Coast to feed and prepare for flight to South America.
The species is a low-altitude migrant that tends to stopover at leading landscape edges. Formerly federally-listed as endangered, the species was delisted on October 5, 1994 (USFWS, 1994). Due to its similarity to the American Peregrine Falcon when viewed at a distance, the Arctic Peregrine Falcon should be treated as state-listed threatened if any question about identity exists.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. The Arctic Peregrine Falcon could migrate through the project area; however, because appropriate habitat for the species does not occur within the project area, any occurrence would be considered incidental.

Henslow’s Sparrow (Ammodramus henslowii)

The Henslow’s Sparrow is normally found in weedy fields, although it is often absent from seemingly suitable habitat (Audubon, 2017). It breeds in fields and meadows, often in low-lying or damp areas, with tall grass, standing dead weeds, and scattered shrubs. Thought to breed in small colonies which change in location from year to year.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. No suitable grasslands were observed in the project study area during field investigations.

Red Knot (Calidris canutus)

The Red Knot is also a federally threatened species and has been previously discussed in that section.

Sprague’s Pipit (Anthus spragueii)

The Sprague’s pipit is a rare songbird of the northern prairie (AAB, 2017b). Found in open grasslands, it feeds and nests exclusively on the ground.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. Open grassland areas are limited within the project study area.

Western Burrowing Owl (Athene cunicularia hypuqae)

The Western Burrowing Owl is found in open grasslands, and may be found near human habitation (AAB, 2017c). It nests and roosts in burrows they’ve dug themselves or taken over from a prairie dog, ground squirrel, or tortoise.

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. No burrows were noted in the project area during field investigations.

Cave Myotis Bat (Myotis velifer)

The cave myotis is a small bat that is found throughout the southwestern U.S. and portions of Mexico. It occurs in central, south, and west Texas during the summer months (TPWD, 2017d). The species is
Biological Resources Existing Conditions

colonial and cave-dwelling, although it is also known to utilize mines, rock crevices, buildings, bridges, culverts, and even abandoned swallow nests for roosting (TPWD, 2017h).

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. Although no caves are known to occur within the project area, swallow (unknown species) nests were identified under the President George Bush Turnpike. The cave myotis bat could utilize these nests, old buildings, or culverts for roosting.

Plains spotted skunk (*Spilogale putorius interrupta*)

Although it prefers wooded, brushy areas and tallgrass prairie, the plains spotted skunk utilizes a wide variety of habitat types, including open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodland (USFWS, 2017g).

No reported occurrences of this species within ten miles of the project area are included in the most recent TXNDD data set. The plains spotted skunk could occur within undeveloped portions of the project study area including fence rows, forest edges, woodlands, and wooded, brushy areas.

**Literature & Sources Cited**

All About Birds (AAB), 2017a. Red Knot. Accessed online

____ (AAB), 2017b. Sprague’s Pipit. Accessed online

____ (AAB), 2017c. Burrowing Owl. Accessed online


Griffith, Glen, Sandy Bryce, James Omernik, and Anne Rogers. 2007. *Ecoregions of Texas.*
Texas Commission on Environmental Quality.


_____ TPWD. 2017b. Annotated County Lists of Rare Species: Collin County (last revision 12/30/2016), Dallas County (last revision 12/30/2016), and Tarrant County (last revision 12/30/2016). http://gis.tpwd.state.tx.us/tpwEndangeredSpecies/DesktopDefault.aspx, accessed June 11, 2017.


Accessed online at


_____USFWS. 1994. Endangered and Threatened Wildlife and Plants; Removal of Arctic Peregrine Falcon


APPENDIX A – PROJECT AREA PHOTOGRAPHS
Segment A: Photo 1 – DFW Area (facing northwest)

Segment A: Photo 2 – DFW Area at Cottonwood Branch (facing south)
Segment A: Photo 3 - Track and vegetation at western track (facing northeast)

Segment A: Photo 4 - Vegetation south of track (towards DFW; facing southwest)
Segment A: Photo 5 - Track and vegetation at Cottonwood Branch Intersection (facing southwest)

Segment A: Photo 6 - Vegetation south of track west of Highway 121 (facing southwest)
Segment A: Photo 7 - Track and vegetation east of Highway 121 (facing northeast)

Segment A: Photo 8 - Track at Royal Lane (facing west)
Segment A: Photo 9 – Cottonwood Branch (facing north)

Segment A: Photo 10 – Oncor Electric parcel (facing southeast)
Segment A: Photo 11 - Track east of Grapevine Creek intersection (facing east)

Segment A: Photo 12 - Track and vegetation near tributary to Grapevine Creek (facing northwest)
Segment A: Photo 13 - Track at Grapevine Creek (facing northeast)

Segment A: Photo 14 - Track at Elm Fork Trinity River (facing northeast)
Segment A: Photo 15 - Track at Hutton Branch (facing northeast)

Segment B: Photo 16 - Track at Broadway Street (facing northeast)
Segment B: Photo 17 - Northeast terminus of Perry Branch (facing southwest)

Segment B: Photo 18 - Track near Columbian Club Drive (facing southeast)
Segment B: Photo 19 - Track east of Surveyor Boulevard (facing west)

Segment B: Photo 20 - Track east of Knoll Trail (facing southwest)
Segment B: Photo 21 - Track at eastern edge of Prestonwood Country Club (facing southwest)

Segment B: Photo 22 - Vegetation along White Rock Creek
Segment B: Photo 23 - Track at Preston Road (facing southwest)

Segment B: Photo 24 - Track at Brentfield Drive (facing northeast)
Segment B: Photo 25 - Track at McKamy Branch crossing (facing southwest)

Segment B: Photo 26 - Tracks at Campbell Road (facing southwest)
Segment B: Photo 27 - Tracks at Osage Branch crossing #2 (facing north)

Segment B: Photo 28 - Track at Osage Branch crossing #1, towards neighborhood park (facing north)
Segment B: Photo 29 - Track west of KCS track intersection (facing southwest)

Segment C: Photo 30 - Track east of KCS track intersection (facing southwest)
Segment C: Photo 31 - Track at Prairie Creek (facing southwest)

Segment C: Photo 32 - Track west of Custer Parkway (facing southwest)
Segment C: Photo 33 - Track west of Highway 190 crossing (facing southwest)

Segment C: Photo 34 - Track at Highway 190 crossing (facing southeast; Spring Creek in view)
Segment C: Photo 35 - Track west of Highway 75 (facing southwest)

Segment C: Photo 36 – Richardson Alternative near eastern terminus (facing southeast)
Segment C: Photo 37 – Richardson Alternative woodlands along Spring Creek (facing west)

Segment C: Photo 38– Richardson Alternative through cropland (facing southeast)
Segment C: Photo 39 – Richardson Alternative along Spring Creek (facing east)

Segment C: Photo 40- Track east of N Avenue (facing west)
Segment C: Photo 41 - Vegetation along track west of Placid Avenue (facing west)

Segment C: Photo 42 - Tracks west of Shiloh Road (facing west)
Segment C: Photo 43 - Tracks from Shiloh Road (facing east)
APPENDIX B – ENVIRONMENTAL ASSESSMENT METHODOLOGY
TECHNICAL MEMORANDUM
Technical Memorandum

Date: Wednesday, March 22, 2017

Project: Task Order 32, Cotton Belt Corridor PE/EIS

To: John Hoppie, Project Manager, DART Capital Planning

From: Tom Shelton, GPC6 Program Manager

Subject: DART GPC VI; Contract Number: C-2012668; Cotton Belt Corridor Environmental (WOTUS, Ecosystems, EJ, Air Quality and Land Use) Assessment Methodology

Introduction: This technical memorandum presents the proposed methodology for conducting field surveys for identifying and updating the following resources within the Cotton Belt Corridor project in support of the EIS preparation: Waters of the U.S. and Wetlands (WOTUS), Ecosystems, and Environmental Justice (EJ) populations, Air Quality and Land Use. Existing technical memorandums (2013) prepared for the Cotton Belt Corridor Project Alternatives and Environmental Considerations Report (AECR) have been reviewed by the GPC6 team and will provide a baseline for the current studies. Additional technical memorandums will be prepared under separate cover for other resource categories. As the alignment and station locations are refined, additional field surveys may be necessary.

Project Description: The 26-mile Cotton Belt Corridor extends between DFW Airport and Shiloh Road in Plano. The alignment traverses seven cities: Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson and Plano. The Cotton Belt Project’s primary purpose is to provide passenger rail connections and service that will improve mobility, accessibility and system linkages to major employment, population and activity centers in the northern part of the DART Service Area. The Cotton Belt Project would interface with three DART Light Rail Transit (LRT) lines: The Red Line in Richardson/Plano, the Green Line in Carrollton and the Orange Line at DFW Airport. Also at DFW Airport, the project would connect to Fort Worth Transit Authority’s TEX Rail Regional Rail Line to Fort Worth and the DFW Airport Skylink People Mover.

Objective: DART is preparing an Environmental Impact Statement (EIS) to assess the impacts and benefits of rail passenger service on the Cotton Belt Corridor. Project oversight will be conducted by the Federal Transit Administration (FTA) in cooperation with the Federal Railroad Administration (FRA) and the Federal Aviation Administration (FAA).
METHODOLOGY

**Waters of the U.S.**: Recent aerial photography, U.S. Geological Survey (USGS) National Hydrography Dataset, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory, and USGS topographic maps (7.5-minute series) of the study area will be used to identify potential locations for waters of the U.S. and areas prone to wetland development before going into the field. Potential waters of the U.S. identified, including wetlands, will be delineated and evaluated using routine on-site methods between April 3 and April 21, 2017 by GPC6 environmental scientists. The surveys will be conducted in accordance with the USACE 1987 Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement for the Great Plains Region (USACE, 2010). The delineations will also be performed to reflect current guidance, Rapanos Guidance, from the USACE and EPA on jurisdictional determination in accordance with U.S. Supreme Court rulings. The delineations will be recorded using a Trimble® sub-meter Geo XT Global Positioning System unit and mapped as a data layer using ArcGIS 10.4. The field delineation will be conducted by foot. Vehicles for field personnel will be parked within DART right-of-way while areas are being delineated. GPC6 biologists will be collecting GPS data for the ordinary high water mark of all streams, boundaries of all wetlands, and data points in wetlands and uplands. They will also be collecting photos and taking field notes on data forms and maps.

**Ecosystems:** The GPC6 project team will review recent aerial photography, USGS topographic maps, Texas Parks and Wildlife Department (TPWD) Natural Diversity Database, TPWD’s Ecological Mapping Systems vegetation data, and USFWS and TPWD county list of threatened, endangered, and rare species, prior to conducting fieldwork for the DART Cotton Belt project. GPC6 environmental scientists will conduct a field survey to identify habitat types, land use, and vegetation types present within the project corridor between April 3 and April 21, 2017. During the field survey, GPC6 Environmental Scientists will record notable species (such as threatened, endangered, or rare species) or active bird nests or roosts observed during the survey.

**Environmental Justice:** U.S. Census data at the block (minority) and block group (low-income) level will be used to identify areas within one mile of the proposed Cotton Belt line containing minority or low-income populations. Census blocks which have a meaningfully greater percentage of minority population than the surrounding county area or more than 50 percent minority would be considered to contain a minority population. Census block groups which have a median household income that is below the 2017 Department of Health and Human Services poverty guideline for a family of four or where the percentage of residents in poverty meaningfully exceeds the level found in the surrounding county will be considered to contain a low-income population. Field investigations will identify any areas of low-income housing, services catering to particular ethnic or economic groups, or signs in languages other than English. GPC6 environmental scientists will conduct the field activities between April 3 and April 21, 2017 via windshield surveys within the study area.
**Air Quality**: Potential stationary sources of air pollutants, sites of future projects, and sensitive receptors will be noted and photographed during field investigations. Current aerial photography and comprehensive plans for the cities of Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson, and Plano will be reviewed to identify potential areas of development and sources of air pollution. Current aerals and business listings will be searched prior to field investigations to identify any sensitive receivers that could be affected by impacts to air quality. The investigations will be done by GPC6 environmental scientists between April 3 and April 21, 2017. The investigations will be conducted by vehicle and on foot within the DART right-of-way.

**Land Use**: Review of existing land use along the project corridor will be accomplished by identifying and reviewing the most recent data from NCTCOG and other relevant sources. The project area will be categorized using this data to identify the most recent condition as well as trends of development through the use of ArcGIS mapping and analysis. The project study area for land use will be one-quarter mile on either side of the Cotton Belt Corridor and one-half mile radius around each proposed station location. Field verification will be conducted along the corridor during the period of April 3 to April 21, 2017. GPC6 environmental scientists will conduct field surveys. Land use will be classified by accessing DART property and public access right-of-ways. Field data collection will be performed through the use of GPS and ground level photography. Economic and residential zones will be classified, as well as public and private facilities including parks, churches, schools and other community resources.