Appendix B

Technical Memoranda and Reports

Disclaimer:

Technical memoranda and reports were prepared as independent documents to support the preparation of the Final Environmental Impact Statement (FEIS) for the Dallas CBD Second Light Rail Alignment (D2 Subway). 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-12

Biological Resources Existing Conditions Technical Memorandum

Technical Memorandum

Date:	Tuesday, August 18, 2020
Project:	D2 Subway Project
To:	Kay Shelton, Environmental Project Manager, DART Capital Planning
From:	James Frye, GPC6 Project Manager
Subject:	DART GPC VI; Contract Number: C-2012668; 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 D2 rail project area which could be impacted by construction of the proposed project. This report was built upon a desktop analysis by project biologists. Due to the high intensity urban use of the project area, no field reconnaissance is necessary.

The biological resource study area used for the assessment of impacts includes the project study area. Although typically a larger search radius may be used in the examination of threatened or endangered species occurrence data, due to the high intensity urban use of the project area and surrounding region, a one-mile search radius was used for an assessment of the potential for threatened or endangered species to occur in the project area. 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 *Dallas, Texas* quadrangle (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 Environmental Protection Agency's (EPA) Ecoregions of Texas.

Description of Existing Conditions

This section describes the existing natural vegetation types, ecoregion and Biotic Provence areas found within the project study area, and provides information regarding rare, threatened, or endangered species of potential occurrence in Dallas County.

Ecoregion and Biotic Province

The project study area occurs within the Northern Blackland Prairie Ecoregion (Griffith et al., 2007). This ecoregion includes rolling to nearly level plains which stretch from Sherman in the 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 meadii*), 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 illinoinensis*) (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 (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. This biotic province also contains numerous interior wetland areas including freshwater marshes, peat bogs, and major river systems.

Vegetation

A desktop vegetation analysis was performed within the project study area using Ecological Mapping Systems of Texas (EMST) spatial data. 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 entire project study area is contained within areas defined by the EMST criteria as urban (High- and low-intensity) (**Figure 2**). In addition, most of the alignment for the project is underground and would not impact surface vegetation.

At-grade vegetation communities within the project study area are found in urban parks and commercial developments and are 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. Any tree removals associated with project activities would be done in accordance with city ordinances, and permits would be obtained, if necessary.

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 of Texas (Freeman, 2003), an area that is roughly analogous to the Texan Biotic Province. The surface of the project area is high and low intensity urban habitats and the wildlife species inhabiting this area would be anticipated to be those which are generally adapted to high intensity urban land use. The project crosses underneath four urban parks/plazas in the downtown area, Belo Garden, Browder Street Mall, Main Street Garden, and

John Carpenter Plaza. Since the project is a segment of underground rail, no surface impacts are anticipated.

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 Dallas County and TPWD's Annotated County List of Rare Species for Dallas County 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 Texas Natural Diversity Database (TXNDD) was reviewed to determine previously recorded occurrences of any of the listed species within or near the project area.

Three federally listed endangered species, two federally listed threatened species, one federally-proposed species, three state-listed endangered species, 12 state-listed threatened species, 42 species of greatest conservation need (SGCN) and five 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 Dallas County (TPWD, 2020a; USFWS, 2020). **Table 1** contains a listing of all of these species, along with their habitat descriptions, information about recorded occurrences of the species (TXNDD, 2020b), and a determination of whether habitat exists within the project area.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Birds						
Bald Eagle *Haliaeetus leucocephalus*	DL	SGCN	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts.	-	No	No impact.
Black-capped Vireo *Vireo atricapilla*	DL	SGCN	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.	-	No	No impact.

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Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Golden-cheeked Warbler *Setophaga chrysoparia*	LE	E	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.	-	No	No effect.
Franklin's gull *Leucophaeus pipixcan*	NL	SGCN	This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.	-	No	No impact.
Interior Least Tern *Sterna antillarum athalassos*	LE	E	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.	-	No	No effect.
Piping Plover *Charadrius melodus*	LT	T	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats.	-	No	No effect.
Red Knot *Calidris canutus rufa*	LT	T	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.	-	No	No effect.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Black rail *Laterallus jamaicensis*	PT	T	Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia	-	No	No impact.
Western Burrowing Owl *Athene cunicularia hypugaea*	NL	SGCN	Open grasslands, especially prairie, plains, and savannah; vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	-	No	No impact.
White-faced Ibis *Plegadis chihi*	NL	T	Prefers freshwater marshes, sloughs, and irrigated rice fields; nests in marshes.	-	Yes	No impact.
Whooping Crane *Grus americana*	LE	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes.	-	No	No effect.
Wood Stork *Mycteria americana*	NL	T	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.	-	No	No impact.
Insects						
American bumblebee *Bombus pensylvanicus*	NL	SGCN	*Bombus pensylvanicus* tends to live and nest in open habitats, such as farmland and fields.	-	No	No impact.
Comanche harvester ant *Pogonomyrmex comanche*	NL	SGCN	The Comanche harvester ant only nests in very deep sandy soils in prairies surrounded by oak forests.	-	No	No impact.

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Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Walking thread-leg katydid *Arethaea ambulator*	NL	SGCN	No species-specific habitat information available; katydids are typically associated with open habitats such as grasslands and savannahs	-	No	No impact.
Mammals						
American badger *Taxidea taxus*	NL	SGCN	Generalist. Prefers areas with soft soils that sustain ground squirrels for food. When inactive, occupies underground burrow. Young are born in underground burrows.	-	No	No impact.
Big brown bat *Epstesicus fuscus*	NL	SGCN	Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.	-	No	No impact.
Cave myotis bat *Myotis velifer*	NL	SGCN	Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, or in abandoned Cliff Swallow (*Hirundo pyrrhonota*) nests; roosts in large groups.	-	No	No impact.
Tricolored bat *Perimyotis subflavus*	NL	SGCN	Forest, woodland and riparian areas are important. Caves are very important to this species.	-	No	No impact.
Mexican free-tailed bat *Tadarida brasiliensis*	NL	SGCN	Roosts in buildings in east Texas. Largest maternity roosts are in limestone caves on the Edwards Plateau. Found in all habitats, forest to desert.	-	No	No impact.
Eastern red bat *Lasiurus borealis*	NL	SOC	Found in a variety of habitats in Texas. Usually associated with wooded areas. Found in towns especially during migration.	-	No	No impact.
Hoary bat *Lasiurus cinereus*	NL	SOC	Known from montane and riparian woodland in Trans-Pecos, forests and woods in east and central Texas	-	No	No impact.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Southeastern myotis bat *Myotis austroriparius*	NL	SGCN	Caves are rare in Texas portion of range; buildings, hollow trees are probably important. Historically, lowland pine and hardwood forests with large hollow trees; associated with ecological communities near water. Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.	-	No	No impact.
Plains spotted skunk *Spilogale putorius interrupta*	NL	SOC	Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	-	No	No impact.
Eastern spotted skunk *Spilogale putorius*	NL	SGCN	Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies.	-	No	No impact.
Western hog-nosed skunk *Conepatus leuconotus*	NL	SGCN	Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes	-	No	No impact.
Swamp rabbit *Sylvilagus aquaticus*	NL	SGCN	Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.	-	No	No impact.
Thirteen-lined ground squirrel *Ictidomys tridecemlineatus*	NL	SGCN	Prefers short grass prairies with deep soils for burrowing. Frequently found in grazed ranchland, mowed pastures, and golf courses.	-	No	No impact.
Long-tailed weasel *Mustela frenata*	NL	SGCN	Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.	-	No	No impact.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Southern short-tailed shrew *Blarina carolinensis*	NL	SGCN	Found in East Texas pine forests and agricultural land. May favor areas with abundant leaf litter and fallen logs. Nest sites are probably under logs, stumps and other debris.	-	No	No impact.
Mink *Neovision vison*	NL	SGCN	Intimately associated with water; coastal swamps & marshes, wooded riparian zones, edges of lakes. Prefer floodplains.	-	No	No impact.
Woodland vole *Microtus pinetorum*	NL	SGCN	Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.	-	No	No impact.
Mountain lion *Puma concolor*	NL	SGCN	Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.	-	No	No impact.
Crustaceans						
A cave-obligate isopod *Caecidotea bilineata*	NL	SOC	Endemic subterranean isopod; no habitat data available	-	No	No impact.
Mollusks						
Louisiana pigtoe *Pleurobema riddellii*	NL	T	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.	Two live specimens and one recently dead shell was collected from the Trinity River in 2013	No	No impact.
Sandbank pocketbook *Lampsilis satura*	NL	T	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.	One unconfirmed live specimen collected in the Trinity River in 2013	No	No impact.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Texas heelsplitter *Potamilus amphichaenus*	NL	T	Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins.	-	No	No impact
Trinity pigtoe *Fusconaia chunii*	NL	T	Found in a variety of habitats but most common in riffles. Inhabits various substrates though most often sand, gravel, and cobble (species was recently split from Texas Pigtoe and occurs in similar habitats	Seven live specimens, originally misidentified as *Fusconaia askewi*, collected from multiple sites in the Trinity River in 2013, upstream of the Continental Avenue bridge	No	No impact.
Plants						
Engelmann's bladderpod *Physaria engelmannii*	NL	SGCN	Grasslands and calcareous rock outcrops in a band along the eastern edge of the Edwards Plateau, ranging as far north as the Red River.	-	No	No impact.
Glandular gay-feather *Liatris glandulosa*	NL	SGCN	Occurs in herbaceous vegetation on limestone outcrops	-	No	No impact.
Glass Mountains coral-root *Hexalectris nitida*	NL	SGCN	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	SGCN	Texas endemic; grasslands on sandy soils and limestone outcrops; flowering April-June.	--	No	No impact.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Hall's prairie clover *Dalea hallii*	NL	SGCN	In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; perennial; flowers May-September, fruiting June-September.	--	No	No impact.
Oklahoma phlox *Phlox oklahomensis*	NL	SGCN	Known from a 1958 collection from an oak woodland four miles east of Garland, Texas	-	No	No impact.
Osage Plains false foxglove *Agalinis densiflora*	NL	SGCN	Mostly grasslands on shallow, gravelly, well-drained, calcareous soils; prairies, dry limestone soils. Annual; flowering August-October.	--	No	No impact.
Plateau milkvine *Matelea edwardsensis*	NL	SGCN	Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; flowering March-October; fruiting August-October.	--	No	No impact.
Texas milk vetch *Astragalus reflexus*	NL	SGCN	Grasslands, prairies, and roadsides on calcareous and clay substrates; Annual; flowering February-June; fruiting April-June.	3 records, all records >70 years old	No	No impact.
Tree dodder *Cuscuta exaltata*	NL	SGCN	Parasitic on various *Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros* species as well as *Acacia berlandieri* and other woody plants; Annual; Flowering May-October; Fruiting July-October.	--	No	No impact.
Warnock's coral-root *Hexalectris warnockii*	NL	SGCN	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.

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Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Fish						
American eel *Anguilla rostrata*	NL	SGCN	Originally found in all river systems from the Red River to the Rio Grande. Aquatic habitats include large rivers, streams, tributaries, coastal watersheds, estuaries, bays, and oceans; habitat generalists and may be found in a broad range of habitat conditions including slow- and fast-flowing waters over many substrate types.	-	No	No impact.
Amphibians						
Woodhouse's toad *Anaxyrus woodhousii*	NL	SGCN	Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.		No	No impact.
Strecker's chorus frog *Pseudocris streckeri*	NL	SGCN	Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates		No	No impact.
Southern dusky salamander *Desmognathus conanti*	NL	SOC	Aquatic and terrestrial: The vegetated riparian and aquatic zones of spring-fed, sandy bottom streams and baygalls in forested areas. Eggs are laid on land under rocks and logs close to the stream edge.	-	No	No impact.
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.	-	No	No impact.

Table 1. Rare, Threatened, and Endangered Species of Potential Occurrence in Dallas County, Texas

Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Texas garter snake *Thamnophis sirtalis annectens*	NL	SGCN	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.	-	No	No impact.
Common garter snake *Thamnophis sirtalis*	NL	SOC	Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.	-	No	No impact.
Texas horned lizard *Phrynosoma cornutum*	NL	T	Open, arid and semi-arid regions with sparse vegetation; soil varies in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September.	-	No	No impact.
Slender glass lizard *Ophisaurus attenuatus*	NL	SGCN	Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.	-	No	No impact.
Massasauga *Sistrurus tergeminus*	NL	SGCN	Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.	-	No	No impact.
Timber rattlesnake *Crotalus horridus*	NL	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover.	-	No	No impact.

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Species	Federal Status	State Status	Species/ Habitat Description	Element Occurrence Records[1]	Habitat Present?	Other Pertinent Information[2]
Western box turtle *Terrapene ornata*	NL	SGCN	Terrestrial: Ornate or western box turtles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.	-	No	No impact.
Eastern box turtle *Terrapene carolina*	NL	SGCN	Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.	-	No	No impact

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

[1]Includes all TXNDD Element of Occurrence Records within a 1-mile radius of the project area.

[2]Federally 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.

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 Dallas County. Due to the high intensity urban use of the project study area, no suitable habitat for any state or federally listed species is present.

A discussion of the habitat requirements for each listed species listed in **Table 1** is found in the following paragraphs.

Federally Listed Endangered

Golden-Cheeked Warbler *(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 habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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 habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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, 2020c). 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). No migration stopover habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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 habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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 (Baker et al., 2020). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Federal Proposed Species

Eastern black rail (*Laterallus jamaicensis*) occupies higher locations within heavily vegetated salt, brackish, and freshwater wetlands, with soils moist or flooded to a shallow depth. The subspecies requires dense vegetative cover that allows movement underneath the canopy. This species are found in a variety of wetland habitats that can be tidally or non-tidally influenced. In predicting habitat suitability, plant structure is considered more important than plant species composition (USFWS, 2018).

State Listed Endangered Species

All state-listed endangered species listed within Dallas County are also federally listed and have been discussed previously.

State Listed Threatened Species

Red Knot (Calidris canutus)

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

Piping plover *(Charadrius melodus)*

The piping plover is also listed as federally threatened and has been 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. Freshwater marshes are the preferred habitat type, 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, 2020d). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Wood Stork *(Mycteria americana)*

The Wood Stork forages in shallow standing water of freshwater and estuarine wetlands. This species roosts in colonies including various other wading birds. At one time, Wood Storks were reported to have nested in Texas, but there have not been any breeding records from Texas since 1960. The species breeds in Florida, Georgia, South Carolina, Mexico and South America (USFWS, 2020b). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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. 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, 2020e). No habitat is present within the project study area; however, three occurrences of this species are reported within one mile of the project study area in the Trinity River.

Sandbank pocketbook *(Lampsilis satura)*

The sandbank pocketbook is a freshwater mussel that lives in creeks, medium, and large-sized rivers with moderate flows. This mussel is typically found on gravel, gravel-sand and sandy bottoms (NatureServe, 2020a). The sandbank pocketbook has been found within Arkansas, Louisiana, Mississippi, and Texas, and has been recorded in Dallas County. One confirmed occurrence of this species was reported in the Trinity River, within one mile of the project study area, but no habitat is present within the project area.

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. No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Trinity pigtoe *(Fusconaia chunii)*

The Trinty pigtoe is a freshwater mollusk normally found in a variety of habitats but most common in riffles. Inhabits various substrates though most often sand, gravel, and cobble (species was recently split from Texas Pigtoe [*Fusconaia askewi*] and occurs in similar habitats, including 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 that includes the Trinity River above Lake Livingston, a tributary of the West Branch San Jacinto River, and the Sabine River above Toledo Bend Reservoir. Although the Trinity pigtoe was collected in the Trinity River approximately one mile from the project area, no habitat is present within the project area.

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 habitat is

present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Texas Horned Lizard *(Phrynosoma cornutum)*

The Texas horned lizard prefers open, arid and semi-arid habitats with sparse vegetation, including grass and cactus (TPWD, 2020f). 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, 2020f). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

State Species of Concern

Franklin's Gull (Leucophaeus pipixcan)

The Franklin's gull is a spring and fall migrant throughout Texas. Migrant habitat includes inland lakes, bays, and estuaries. It forages in flooded fields, pastures, croplands, and prairies, also estuaries, bays, mudflats, lagoons, and lakes. It may also be found in harbors, river mouths, mudflats, and salt ponds, feeding over flooded fields and marshes, also sewage ponds and burned-over pastures (Burger and Gochfeld, 2020). Although the Franklin's Gull may be a migrant through the area, no migrant stopover habitat occurs in the project area.

Bald Eagle (Haliaeetus leucocephalus)

The bald eagle was formerly federally listed as threatened but was delisted on August 9, 2007 (USFWS, 2020c). 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. No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Black-capped Vireo *(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). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Western Burrowing Owl (Athene cunicularia hypugaea)

The western burrowing owl is found in open grasslands, and may be found near human habitation (Poulin et al., 2020). It nests and roosts in burrows they've dug themselves or taken over from a prairie

dog, ground squirrel, or tortoise. No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Caecidotea bilineata (a cave obligate isopod)

Although habitat information for this species is limited, it is documented to occur in aquatic subterranean habitats. There is no habitat for this species in the project area.

American eel (Anguilla rostrata)

The American eel inhabits marine, estuarine and fresh water habitats just like many other diadromous species. The American eel is a migratory species, it spends its adult life in fresh water and then migrates down to the salt water to reproduce (USFWS, 2020d). No habitat for the American eel occurs in the project area.

American bumblebee (Bombus pensylvanicus)

Like many other bees, the American bumblebee is an important pollinator and forages in prairies, grasslands, parks, gardens and also forests. No habitat occurs within the project area.

Comanche harvester ant (Pogonomyrmex comanche)

The Comanche harvester ant is found only in very deep, sandy prairies surrounded by oak forests in Arkansas, Kansas, Louisiana, Oklahoma, and Texas. This habitat is uncommon and disjunct in distribution (Mayo, 2015).

Walking-thread katydid (Arethaea ambulator)

Although habitat information for this species is limited, katydids are typically associated with open habitats such as grasslands and savannahs. There is no habitat for this species in the project area.

American badger (Taxidea taxus)

American badgers occupy a variety of habitats, but are most common in the prairie and desert sections of west Texas. Limited numbers occur in the mountains, where individuals have been seen or captured at elevations well above 3,000 m. In Texas, they range from sea level up to 1,500 m. In general, they occupy the entire range inhabited by ground squirrels and prairie dogs, which they rely on for food (Schmidly and Bradley, 2016a). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Big brown bat (Eptesicus fuscus)

The big brown bat is generally a forest dweller, but it also may use attics and crevices in buildings, caves, and crevices in rocks for daytime roosts. Natural roosts are under the loose bark of dead trees and in cavities of trees. These bats emerge rather early in the evening and feed among the trees, often following a regular route from one treetop to another and back again (Schmidly and Bradley, 2016b). No

habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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. The species is 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, 2020g). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Eastern red bat (Lasiurus borealis)

Eastern red bats are forest-dwelling, solitary bats and do not use caves, mine tunnels, or similar sites. Roosting sites are common in tree foliage or Spanish moss, where the bats are concealed as they resemble dead leaves (Schmidly and Bradley, 2016c). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Hoary bat (Lasiurus cinereus)

The hoary bat typically roosts in deciduous or coniferous tree foliage between 3–19 m above the ground and often near the edge of a clearing. They tend to prefer mature forest areas with trees that are taller and larger than average in diameter. The hoary bat is more or less solitary and roosts in the open by hanging from a branch or twig. The primary food is moths, although they are also known to eat beetles, flies, grasshoppers, termites, dragonflies, and wasps (Schmidly and Bradley, 2016d). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Brazilian free-tailed bat (Tadarida brasiliensis)

The Brazilian free-tailed bat uses caves, mine tunnels, old wells, hollow trees, human habitations, bridges, and other buildings as daytime retreats. Suitable roost characteristics include relatively dark, dry retreat where from several dozen to several million individuals can hang up in close association and have enough space below so they can drop when taking wing. Hollows under roofs, spaces between downtown buildings, attics, narrow spaces between signs and buildings, and spaces in the walls of buildings all offer suitable refuge sites for these bats (Schmidly and Bradley, 2016e). Although there may be some suitable habitat in the project vicinity, no habitat is present within the project area and no occurrences of this species are reported within one mile of the project study area.

Southeastern myotis bat (Myotis austroriparius)

The southeastern myotis is predominantly a cave bat; however, in Texas, these bats roost primarily in live, hollow bottomland hardwood trees close to slow-moving rivers and in fabricated structures such as abandoned houses and culverts. This species forages at ponds and streams near their diurnal roosts

(Schmidly and Bradley, 2016f). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Tricolored bat (Perimyotis subflavus)

The tricolored bat roosts in caves, crevices in cliffs, mine tunnels, buildings, and other human structures offering concealment. They are relatively slow and erratic in flight appearing like large moths. They appear to prefer bodies of water as foraging grounds. In winter, this species hibernates in suitable caves within its summer range (Schmidly and Bradley, 2016g). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Eastern and Plains spotted skunk (Spilogale putorius and S. p. interrupta)

Spotted skunks occur largely in wooded areas and tall-grass prairies, and are less common in the short-grass plains. In areas where common, they occasionally den in hollow trees, live around farmyards and, in rocky areas, they prefer cracks and crevices in the rocks or a burrow under a large rock. In urban areas, they frequently live under buildings, in underground tile drains, and in underground burrows. They are almost entirely nocturnal and seldom are seen in the daytime (Schmidly and Bradley, 2016h; USFWS, 2020e). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Western hog-nosed skunk (Conepatus leuconotus)

Hog-nosed Skunks mainly inhabit the foothills and partly timbered or brushy sections of their general range, but they usually avoid hot desert areas and heavy stands of timber. They are most common in rocky, sparsely timbered areas such as the Edwards Plateau of central Texas and the Chisos, Davis, and Guadalupe Mountains of Trans-Pecos Texas. In South Texas, they occur in several habitat types, including live oak brush, mesquite brushland, and improved pasture within semi-open native grassland. In general, hog-nosed skunks are nocturnal (Schmidly and Bradley, 2016i). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Long-tailed weasel (Mustela frenata)

Long-tailed weasels occur in most ecoregions where woodlands or forests are available. They typically nest in a rotten log, hollow stump, under tree roots, or in a hole in the ground. Weasels are active year-round, both in the daytime and at night but more so after dark. They range over a fairly large hunting area, which may take them several days to traverse. Their nightly forays usually cover only a portion of their home range (Schmidly and Bradley, 2016j). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Mink (Neovison vison)

American mink are semi-aquatic mammals and live in dens located near water in locations such as rock crevices or cavities among rocks, near the base of a bridge or dam, under tree roots, holes in stream

banks, in debris piles along streams or a commandeered muskrat den. They swim well enough to catch fish, and they can remain submerged for considerable periods of time. Mink are active year-round and do not hibernate. They are mainly nocturnal but often appear at dawn and dusk and less frequently during the day (Schmidly and Bradley, 2016k). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Mountain lion (Puma concolor)

Mountain lions are solitary except for a short breeding period of up to two weeks, duration, when the female is in estrous. Once distributed statewide, currently most common in desert mountain ranges of the Trans-Pecos region, especially in Big Bend National Park. It is uncommon in the Edwards Plateau and dense brushlands of the Rio Grande Plains (Schmidly and Bradley, 2016l). Mountain lions do not occur in downtown Dallas, including the project area.

Southern short-tailed shrew (Blarina carolinensis)

Short-tailed shrews occur in forested areas with associated meadows and openings where adequate cover and food are present. The species is well-adapted to digging and their burrows are multi-leveled and often occur under fallen logs (Schmidly and Bradley, 2016m). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Swamp rabbit (Sylvilagus aquaticus)

The swamp rabbit is well-adapted to a semi-aquatic habitat and in inland areas occurs in floodplains of rivers and streams and their associated tangles of shrubs, trees, and vines as well as marshes. It is seldom seen during the day except when flushed from its den in a thicket or brush. The swamp rabbits frequent a definite local range, which they refuse to leave even when pursued by dogs. Little is known of their food habits, although succulent vegetation, including grasses, forbs, and the new shoots of shrubs, are probably important (Schmidly and Bradley, 2016n). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Thirteen-lined ground squirrel (Ictidomys tridecemlineatus)

The thirteen-lined ground squirrels typically inhabit short-grass prairies, but they also occur in tallgrass pastures and excavate burrows near fence posts along fencerows. This species live in burrow systems in the ground with well-marked paths, which become tunnels in tall grasses. They may use abandoned burrows of pocket gophers and prairie dogs. This species is diurnal and have a long winter hibernation period (Schmidly and Bradley, 2016o). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Woodland vole (Microtus pinetorum)

The woodland vole habitat includes primarily woodland areas where ground cover in the form of leaf litter and lodged grasses offers suitable cover. They are restricted to the eastern half of the state where

sufficient rainfall is conducive to easy shallow surface burrowing. Although they sometimes use surface runways in grassy areas, they are more inclined to spend their time in underground galleries that they dig for themselves or usurp from moles, short-tailed shrews, or other small mammals (Schmidly and Bradley, 2016p). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Southern Dusky Salamander (Desmognathus conanti)

Southern dusky salamanders are found throughout the Coastal Plain of the southeastern US, but are absent from peninsular Florida. It has been found in two very different types of habitats. It lives primarily in swampy, mucky habitats of larger streams, river floodplains, and swampy lake margins. However, this species is occasionally found in first order streams. They are often found under cover such as branches, logs, or rocks (CPILC, 2015). Due to the high intensity developed land use, no habitat for the southern dusky salamanders occurs in the project area.

Strecker's Chorus Frog (Pseudocris streckeri)

The Strecker's chorus frog is found in moist woodland areas, rocky ravines, near streams, in swamps, or in cultivated fields. This species is nocturnal and feeds on insects (LaDuc and Cannatella, 2020a). They are known to inhabit temperate grasslands, wetlands, canals, and drainage channels. Most of the time, Strecker's chorus frogs remain burrowed underground (Hintz and Yezek, 2011).

Woodhouse's toad (Anaryxus woodhousii)

The Woodhouse's toad uses a wide variety of habitats but prefers sandy areas near marshes, river bottoms, desert streams, canyons, irrigated fields, in addition to well-irrigated suburban backyard gardens. This species is nocturnal and feeds on insects, typically near light sources. During the day it shelters in burrows or among vegetation (LaDuc and Cannatella, 2020b). Although this species is adaptable to developed environments, the high intensity of the development and the below grade nature of the project area, suitable habitat is unlikely to occur in the project area.

Common garter snake (Thamnophis sirtalis)

The common garter snake lives in areas with standing or running water, but can also be seen in open or edge habitats. This species is a generalist feeder eats whatever appropriately-sized prey it can find, primarily amphibians, fish and insects, with juveniles eating a greater proportion of earthworms and insects than do adults (LaDuc and Cannatella, 2020c). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Texas Garter Snake (Thamnophis sirtalis annectens)

The Texas garter snake is a subspecies of the common garter snake, but is more common in 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 (Werler and Dixon, 2000). No habitat is present

within the project study area and no occurrences of this species are reported within one mile of the project study area.

Massasauga (Sistrurus tergeminus)

The massasauga habitat ranges from flat grasslands to low rocky hillsides, whereas *S. c. edwardsii* is restricted to the low, flat grasslands (LaDuc and Cannatella, 2020d). Preferred habitat is generally bottomland or wet prairies dominated by cordgrass, sedges, bullrushes, and smartweeds, and lowlands by rivers, lakes, and marshes with numerous crayfish burrows providing shelter from predators and weather conditions (MODC, 2020). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Timber rattlesnake (Crotalus horridus)

Timber rattlesnakes are found throughout east Texas 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, 2020i). 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 habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Slender glass lizard (Ophisaurus attenuates)

The slender glass lizard typically occurs in dry grasslands as well as in wooded areas but may also be found on many of the coastal barrier islands. This species is diurnal and feeds on insects, spiders, and small vertebrates (LaDuc and Cannatella 2020e). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Eastern box turtle (Terrapene carolina)

The eastern box turtle is commonly found throughout open woodlands as well as grasslands and meadows. Although a terrestrial turtle, this species can be found wading in water or mud to escape the heat. This species is an omnivore, eating vegetable matter, such as fruits and roots, as well as animal matter, such as small vertebrates as well as invertebrates (LaDuc and Cannatella 2020f). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Western box turtle (Terrapene ornate)

The western, or ornate, box turtle species is generally restricted to the prairies where it finds shelter in burrows in sandy soils or under fallen vegetation. Insects make up the majority of the diet in ornate box turtles. This species is also known to eat carrion, bird eggs, small vertebrates and even fruit (LaDuc and Cannatella 2020g). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Engelmann's bladderpod (Physaria engelmannii)

The Engelmann's bladderpod is endemic to Texas and Oklahoma with records occurring in 21 Texas counties, eight Oklahoma counties across three ecoregions: Cross Timbers, Blackland Prairie, and Edwards Plateau. Specimen data from sites within the western range (Fort Worth Prairie south to the Edwards Plateau) indicates Engelmann's bladderpod plants are found on a "limestone outcrop in prairie", in "shallow clay soil", on "rocky limestone slopes", and on "limestone hillslope, partially eroding just below ridgetop". Blackland Prairie sites are apparently similar with plants growing in a "limestone outcrop", on a "rocky prairie", a "caliche outcrop", or in "shallow soil with outcrops of Austin Chalk" (BRIT 2020).

Glandular gayfeather (Liatris glandulosa)

The Texas endemic occurs on limestone outcrops and shallow gravelly soils over limestone on gentle slopes and flats in the Blackland Prairie ecoregion (NatureServe 2020b). No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Oklahoma phlox (Phlox oklahomensis)

Tallgrass prairies and mixed-grass prairies, usually in shallow soil over limestone. The entire range of Oklahoma phlox covers about 10 counties in southern Kansas, central Oklahoma, and northeastern Texas (KWG, 2020). No habitat is present within the project study area and no occurrences of this species are reported within one mile of 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, 2020). No habitat is present within the project study area and no occurrences of this species are reported within one mile of 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 known to occur in Hood, Parker, Somervell, and Tarrant Counties. No habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

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 habitat is present within the project study area and no occurrences of this species are reported within one mile of 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, 2020c). This species primarily occurs on shallow, well-drained, gravelly calcareous soils over limestone, in upland tallgrass prairies. No habitat is present within the project study area and no occurrences of this species are reported within one mile of 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, 2020d). It seems to occur in small numbers over a variety of habitats. No habitat is present within the project study area and no occurrences of this species are reported within one mile of 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. 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, 2020e). Three records are located within one mile of the project study area, but these records are all over 70 years old. No habitat is present within the project study area.

Tree Dodder (Cuscuta exaltata)

Tree dodder is an herbaceous annual, which is found in Texas and Florida (NatureServe, 2020f). 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 habitat is present within the project study area and no occurrences of this species are reported within one mile of 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 habitat is present within the project study area and no occurrences of this species are reported within one mile of the project study area.

Literature & Sources Cited

Baker, A., P. Gonzalez, R. I. G. Morrison, and B. A. Harrington. 2020. Red Knot (*Calidris canutus*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

Blair, W. F. 1950. The Biotic Provinces of Texas. The Texas Journal of Science 2: 93-117.

Botanical Research Institute of Texas (BRIT). 2020. Rare Plant Surveys: *Physaria engelmannii* (Engelman's bladderpod). Accessed online at http://brit.org/physaria-engelmannii Accessed on August 12, 2020.

Burger, J. and M. Gochfeld. 2020. Franklin's Gull (*Leucophaeus pipixcan*), version 1.0. In Birds of the World: A. F. Poole, Editor. Cornell Lab of Ornithology, Ithaca, NY, USA. https://birdsoftheworld.org/bow/species/fragul/cur/habitat

Campbell, L. 1995. Endangered and Threatened Animals of Texas, Their Life History and Management. Texas Parks and Wildlife Department PWD BK W7000-013.

Coastal Plains Institute and Land Conservancy (CPILC), 2015. Petition to List the Southern Dusky Salamander (*Desmognathus auriculatus*) as Threatened Under the Endangered Species Act. Petitioner Dr. Bruce Means, submitted to the Secretary of the Interior April 2, 2015.

Diamond, D. D. and F. E. Smeins. 1993. The Native Plant Communities of the Blackland Prairie. In: M. R. Sharpless and J. C. Yelderman [eds.]. The Texas Blackland Prairie: Land, history, and culture. Waco, TX: Baylor University Press. p 66–81.

Freeman, B. 2003. Birds of the Oaks and Prairies and Osage Plains of Texas: A Field Checklist. Texas Parks and Wildlife Department PWD BK W7000-869.

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

Hintz, B. and T. Yezek 2011. "Pseudacris streckeri" (On-line), Animal Diversity Web. Accessed August 10, 2020 at https://animaldiversity.org/accounts/Pseudacris_streckeri/

International Crane Foundation (ICF), 2017, Wintering Whooping Crane Update. Accessed online at https://www.fws.gov/refuge/Quivira/wildlife_and_habitat/whooping_crane.html, June 23, 2017.

Kansas Wildflowers and Grasses (KWG). 2020. Oklahoma phox, *Phlox oklahomensis*. Accessed online at https://www.kswildflower.org/flower_details.php?flowerID=670 Accessed on August 12, 2020.

Lady Bird Johnson Wildflower Center (LBJ). Native Plants Database. Accessed online at https://www.wildflower.org/plants/ June 23, 2017.

LaDuc, Travis and David Cannatella. 2020a. Woodhouse's toad. Herps of Texas. Accessed online at https://www.herpsoftexas.org/content/woodhouses-toad Accessed on August 10, 2020.

_____ 2020b. Strecker's chorus frog. Herps of Texas. Accessed online at http://www.herpsoftexas.org/content/streckers-chorus-frog Accessed on August 10, 2020.

_____ 2020c. Common Gartersnake. Herps of Texas. Accessed online at https://www.herpsoftexas.org/content/common-gartersnake Accessed on August 12, 2020.

_____ 2020d. Massasauga. Herps of Texas. Accessed online at https://www.herpsoftexas.org/content/massasauga Accessed on August 12, 2020.

_____ 2020e. Slender Glass Lizard. Herps of Texas. Accessed online at https://www.herpsoftexas.org/content/slender-glass-lizard Accessed on August 12, 2020.

_____ 2020f. Eastern Box Turtle. Herps of Texas. Accessed online at https://www.herpsoftexas.org/content/eastern-box-turtle Accessed on August 12, 2020.

_____ 2020g. Ornate Box Turtle. Herps of Texas. Accessed online at https://www.herpsoftexas.org/content/ornate-box-turtle Accessed on August 12, 2020.

Mayo, Ann B. 2015. The Spatial Ecology of the Comanche Harvester Ant Pogonomyrmex Comanche (Hymenoptera: Formicidae). Dissertation for Doctor of Philosophy, the University of Texas at Arlington.

Missouri Department of Conservation (MODC). 2020. Prairie Massasauga *Sistrurus tergemminus*. Accessed online at https://nature.mdc.mo.gov/discover-nature/field-guide/prairie-massasauga Accessed on August 12, 2020.

Natural Wildlife Federation (NWF). 2017. Alligator Snapping Turtle. Accessed online at https://www.nwf.org/Wildlife/Wildlife-Library/Amphibians-Reptiles-and-Fish/Alligator-Snapping-Turtle.aspx, on June 30, 2017.

NatureServe, 2020a. Lampsilis satura. Accessed online at http://explorer.natureserve.org/servlet/NatureServe?searchSpeciesUid=ELEMENT_GLOBAL.2.117064 Accessed on August 12, 2020.

NatureServe, 2020b. Liatris glandulosa. Accessed online at https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.821463/Liatris_glandulosa Accessed on August 12, 2020.

NatureServe, 2020c. Agalinis densiflora. Accessed online at http://explorer.natureserve.org/servlet/NatureServe?searchName=Agalinis+densiflora Accessed on August 12, 2020.

NatureServe, 2020d. Matelea edwardsensis. Accessed online at http://explorer.natureserve.org/servlet/NatureServe?searchName=Matelea+edwardsensis Accessed on August 12, 2020.

NatureServe, 2020e. Astragalus reflexus. Accessed online at

http://explorer.natureserve.org/servlet/NatureServe?searchSpeciesUid=ELEMENT_GLOBAL.2.132575 Accessed on August 12, 2020.

NatureServe, 2020f. Cuscuta exaltata. Accessed online at http://explorer.natureserve.org/servlet/NatureServe?searchName=Cuscuta+exaltata Accessed on August 12, 2020.

North American Orchid Conservation Center (NAOCC), 2020. *Hexalectris nitida* – Glass Mountain Coral Root, Shining Cock's Comb. Accessed online at http://goorchids.northamericanorchidcenter.org/species/hexalectris/nitida/?pile=orchid-monocots August 12, 2020

Poole, J.M., W.R. Carr, D.M. Price, and J.R. Singhurst. 2007. Rare Plants of Texas. Texas A&M University Press, College Station, Texas.

Poulin, R. G., L. D. Todd, E. A. Haug, B. A. Millsap, and M. S. Martell. 2020. Burrowing Owl (*Athene cunicularia*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY.

Schmidly, David J. and Robert D. Bradley. 2016a. American badger. From the Mammals of Texas, Seventh Edition. University of Texas Press. Accessed online at https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Taxidea_taxus.php Accessed on August 11, 2020.

_____. 2016b. Big brown bat. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Chiroptera/Eptesicus_fuscus.php Accessed on August 11, 2020.

_____. 2016c. Eastern red bat. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Chiroptera/Lasiurus_borealis.php Accessed on August 11, 2020.

_____. 2016d. Hoary bat. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Chiroptera/Aeorestes_cinereus.php Accessed on August 11, 2020.

_____. 2016e. Brazilian free-tailed bat. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Chiroptera/Tadarida_brasiliensis.php Accessed on August 11, 2020.

_____. 2016f. Southeastern myotis bat. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Chiroptera/Myotis_austoriparius.php Accessed on August 11, 2020.

_____. 2016g. Tricolored bat. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Chiroptera/Perimyotis_subflavus.php Accessed on August 11, 2020.

_____. 2016h. Spotted skunk. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Spilogale_putorius.php Accessed on August 11, 2020.

_____. 2016i. Western hog-nosed skunk. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Conepatus_leuconotus.php Accessed on August 11, 2020.

_____. 2016j. Long-tailed weasel. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Mustela_frenata.php Accessed on August 11, 2020.

_____. 2016k. Mink. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Vison_vison.php Accessed on August 11, 2020.

_____. 2016l. Mountain lion. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Carnivora/Puma_concolor.php Accessed on August 11, 2020.

_____. 2016m. Short-tailed shrew. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Soricomorpha/Blarina_carolinensis.php Accessed on August 11, 2020.

_____. 2016n. Swamp rabbithttps://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Lagomorpha/Sylvilagus_aquaticus.php Accessed on August 11, 2020.

_____. 2016o. Thirteen-lined ground squirrel. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Rodentia/Ictidomys_tridecemlineatus.php Accessed on August 11, 2020.

_____. 2016p. Woodland vole. https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/Accounts_Rodentia/Microtus_pinetorum.php Accessed on August 11, 2020.

Singhurst, Jason. 2015. Flora Fact: Over and Over Prairie Clovers come in all Shapes and Sizes. Accessed online https://www.tpwmagazine.com/archive/2015/jul/scout3_florafact_clover/ May 8, 2017.

Tennant, Alan. 1985. A Field Guide to Texas Snakes. Texas Monthly Press. Austin, Texas.

Texas Parks and Wildlife Department (TPWD). 2020a. Annotated County Lists of Rare Species: Dallas County (last revision 06/26/2020), http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx, accessed August 7, 2020.

_____TPWD. 2020b. Texas Natural Diversity Database. Element Occurrence Report and shapefile data for the Dallas, Texas and surrounding 7.5-minute USGS topographic quadrangles, received August 20, 2018.

_____TPWD. 2020c. Whooping Crane. Accessed online at http://tpwd.texas.gov/huntwild/wild/species/whooper/ Accessed on August 11, 2020.

_____TPWD. 2017d. White-faced Ibis (*Plegadis chihi*). Accessed online at http://www.tpwd.state.tx.us/huntwild/wild/species/ibis/ Accessed on August 11, 2020.

_____TPWD. 2017e. Louisiana Pigtoe *Pleurobema riddellii*. Accessed online at https://www.fws.gov/southwest/es/ArlingtonTexas/pdf/Louisiana%20pigtoe%20fact%20sheet%2020170301.pdf Accessed on August 12, 2020.

_____TPWD. 2017f. Texas horned Lizard (*Phrynosoma cornutum*). Accessed online at http://tpwd.texas.gov/huntwild/wild/species/thlizard/ Accessed on August 11, 2020.

_____TPWD. 2017g. Cave Myotis (*Myotis velifer*). Accessed online at http://www.tpwd.state.tx.us/huntwild/wild/species/cavemyotis/ Accessed on August 11, 2020.

_____TPWD. 2017h. Timber rattlesnake (*Crotalus horridus*). Accessed online at http://www.tpwd.state.tx.us/huntwild/wild/species/timberrattlesnake/ Accessed on August 11, 2020.

_____TPWD. 2016. Ecological Systems Classification and Mapping Project. Accessed online at http://tpwd.texas.gov/arcgis/rest/services/Vegetation_Mapping/Texas_Ecological_Mapping_Systems_Data/MapServe, April 27, 2017.

_____TPWD. 2009. TPWD News Release November 5, 2009: 15 Texas Freshwater Mussels Placed on State Threatened List. Accessed online at http://www.tpwd.state.tx.us/newsmedia/releases/?req=20091105c, December 3, 2009.

U.S. Fish and Wildlife Service (USFWS). 2020a. Information for Planning and Consultation. Endangered Species List for Dallas County, Texas, August 7, 2020.

_____USFWS. 2020b. U.S. Fish and Wildlife Service Species Profile: Wood stork (*Mycteria americana*). Accessed online at https://www.fws.gov/northflorida/Species-Accounts/Wood-stork-2005.htm Accessed on August 11, 2020.

_____USFWS. 2020c. U.S. Fish and Wildlife Service, Midwest Region: Bald Eagle. Accessed online at http://www.fws.gov/midwest/eagle/ Accessed on August 11, 2020.

_____USFWS, 2020d. Fish and Aquatic Conservation: American Eel. Accessed online at https://www.fws.gov/fisheries/freshwater-fish-of-america/american_eel.html Accessed on August 11, 2020.

_____USFWS. 2020e. Environmental Conservation Online System. Plains Spotted skunk. Accessed online at https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0GI#lifeHistory Accessed on August 11, 2020.

_____USFWS, 2018. Species status assessment report for the eastern black rail (*Laterallus jamaicensis jamaicensis*), Version 1.2. June 2018. Atlanta, GA.

_____USFWS. 2009. Endangered and Threatened Wildlife and Plants; 90-Day Finding on Petitions to List Nine Species of Mussels from Texas as Threatened or Endangered with Critical Habitat. Federal Register, Vol. 74 No. 239, p. 66260-66271, December 15, 2009.

Werler, John E. and James R. Dixon. 2000. Texas Snakes; Identification, Distribution, and Natural History. University of Texas Press.