

## Appendix G: Pilot Area Characteristics

Three proposed corridors—State Highway (SH) 170 road segment, SH 360 road segment, and Lake Lavon rail—as outlined in the region's Metropolitan Transportation Plan, "Mobility 2030," helped to guide the work under a Federal Highway Administration (FHWA) grant to integrate transportation and resource planning to develop ecosystem based infrastructure projects. The goal of this grant was to develop a Regional Ecosystem Framework (REF) to guide the implementation of an ecosystem approach to mitigate the effects of infrastructure projects.

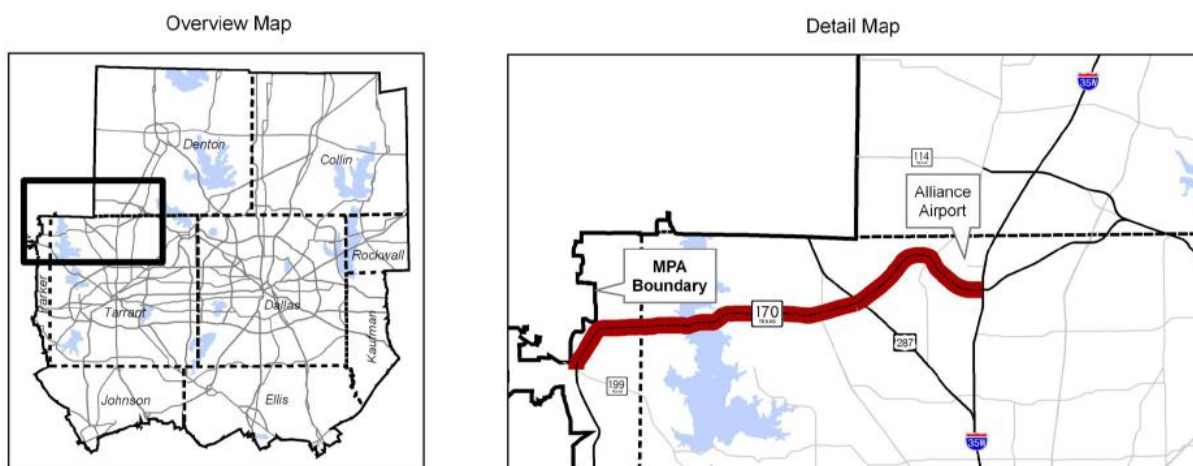
The purpose of this document is to accompany Chapter 4 of the REF User's Guide and to tell the story of the pilot areas to help characterize the potentially affected environment. This is important to the process of identifying and assessing vital ecosystems for determining potential impacts to the natural environment as a result of transportation infrastructure development. A description of some of the existing conditions, concerns, and vital ecosystems within the three pilot areas is presented below. Topics discussed include the corridors' location and land use, land cover, water resources, and ecological characteristics of the pilot areas.

### State Highway 170 Corridor Pilot Area

#### Location

The proposed SH 170 road segment is located in the Dallas-Fort Worth metropolitan area of North Central Texas. This segment is outlined in Mobility 2030 to be part of the future Dallas-Fort Worth Regional Outer Loop System. The limits of the corridor would extend from SH 199 to Interstate Highway 35W. See Figure G.1.

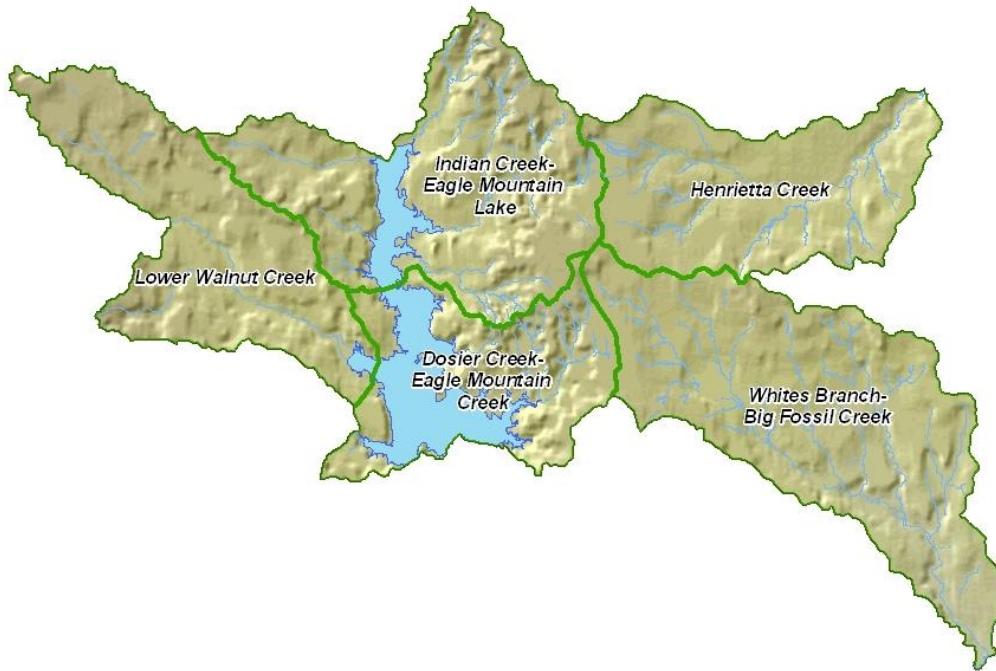
#### SH 170 Corridor: Location



**Figure G.1:** Overview map and detailed map of the SH 170 corridor as presented in Mobility 2030.<sup>1</sup>

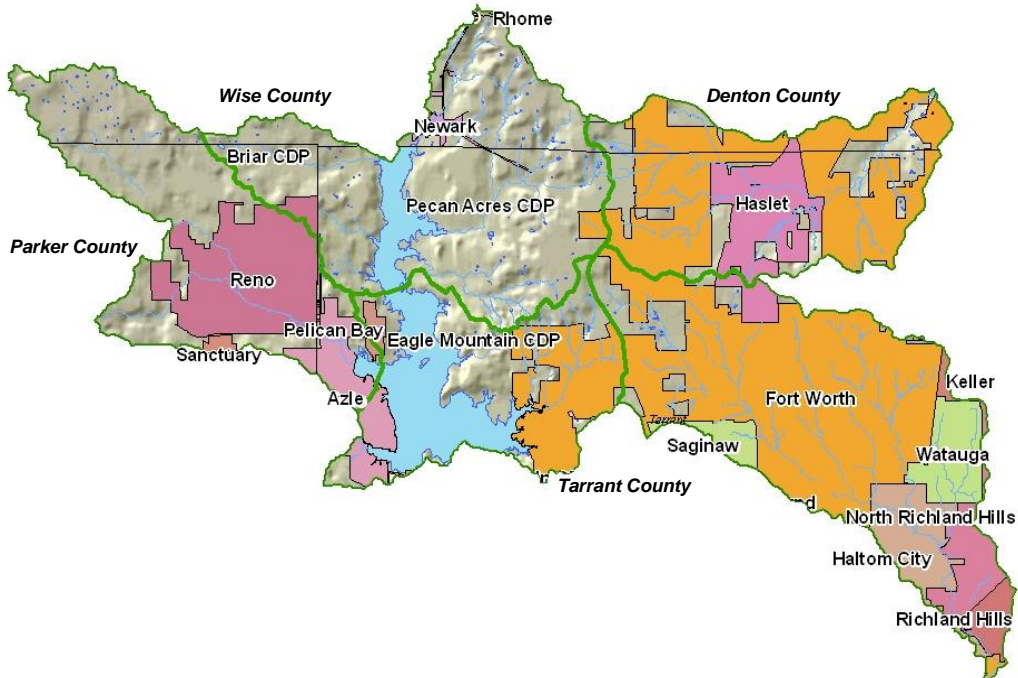
The proposed SH 170 corridor lies within five subwatersheds, and includes the Indian Creek-Eagle Mountain Lake, Lower Walnut Creek, Dosier Creek-Eagle Mountain Creek, Whites Branch-Big Fossil Creek, and Henrietta Creek subwatersheds. See Figure G.2. The majority of this area is located in northwest Tarrant County but also reaches into northeast Parker County, southeast Wise County, and southwest Denton County. Portions of the pilot area fall within the boundaries of the following cities: Azle, Briar Census-Designated Place (CDP), Eagle Mountain CDP, Fort Worth, Haltom City, Haslet, Keller, Newark, North Richland Hills, Pecan Acres CDP, Pelican Bay, Reno, Rhome, Richland Hills, Saginaw, Sanctuary, and Watauga. The City of Fort Worth occupies more land in the pilot area than any other city. The central and northwestern areas are predominately unincorporated. See Figure G.3.

### SH 170 Corridor Pilot Area: Subwatersheds



**Figure G.2:** The five subwatersheds that make up the SH 170 Corridor Pilot Area—Lower Walnut Creek, Indian Creek-Eagle Mountain Lake, Dosier Creek-Eagle Mountain Creek, Henrietta Creek, and Whites Branch-Big Fossil Creek.

### SH 170 Corridor Pilot Area: Communities

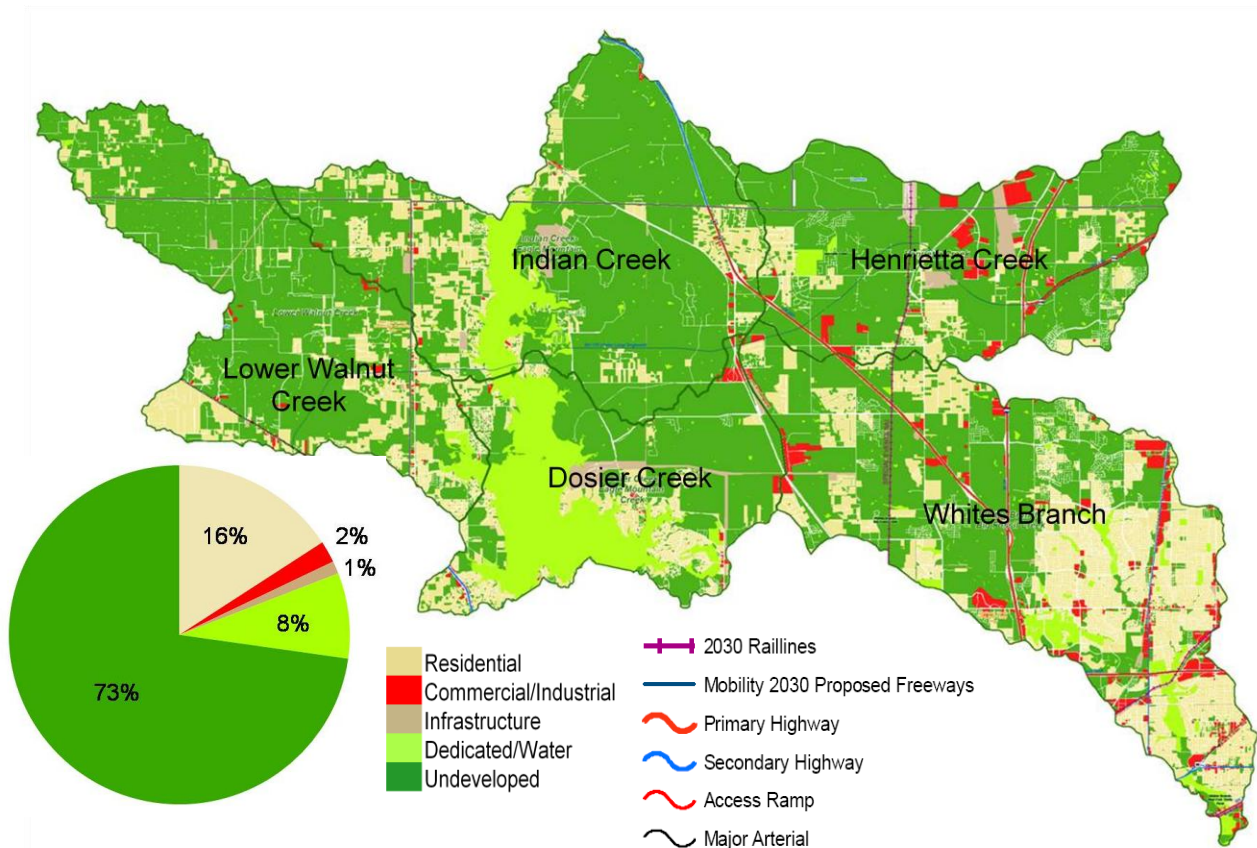


**Figure G.3:** The communities within the SH 170 Corridor Pilot Area—Azle, Briar Census-Designated Place (CDP), Eagle Mountain CDP, Fort Worth, Haltom City, Haslet, Keller, Newark, North Richland Hills, Pecan Acres CDP, Pelican Bay, Reno, Rhome, Richland Hills, Saginaw, Sanctuary, Watauga, Denton County, Parker County, Tarrant County, and Wise County. The areas not shaded represent the unincorporated areas.

### Land Use

The dominating land use category in the SH 170 pilot area is undeveloped land (73 percent), followed by residential (16 percent), dedicated/water (eight percent), commercial/industrial (two percent), and infrastructure (one percent). See Figure G.4. Generally, the east and west parts of the pilot area consists of a mix of residential areas and undeveloped land. The east contains more commercial/industrial facilities than the other areas, while the central area is mostly characterized as dedicated/water and undeveloped.

**SH 170 Corridor Pilot Area: Land Use by Category**



**Figure G.4:** 2005 land use by category (residential, commercial/industrial, infrastructure, dedicated/water, and undeveloped) in the SH 170 Corridor Pilot Area. The pie chart breaks down the total amount of land use in the five subwatersheds by category.

#### Undeveloped

This category consists of areas that are vacant, under construction, or parking lots/garages. Most of the undeveloped land in this pilot area is located in the Lower Walnut Creek (86 percent) and Henrietta Creek (85 percent) subwatersheds. The Dosier Creek subwatershed contains the least amount at 53 percent.

#### Residential

This category consists of areas serving as single family housing, multi-family housing, mobile homes,



**Residential Area Park**

group quarters, and institutional facilities. Residential areas in this pilot area are more common in the Whites Branch subwatershed (27 percent) with the least amount in the Henrietta Creek subwatershed (eight percent). In Whites Branch, large clusters of residential areas are located in the southeast part of this subwatershed, which is the Watauga/Haltom City/North Richland Hills/Richland Hills area. Other large clusters of residential areas are scattered around Eagle Mountain Lake and the southwest part of the Lower Walnut Creek subwatershed.

#### Dedicated/water

This category consists of parks, recreational areas, landfills, flood control areas, or surface water. Eagle Mountain Lake is a major lake in this pilot area, which intersects the Dosier Creek, Indian Creek, and the southeast part of the Lower Walnut Creek subwatersheds. The Dosier Creek subwatershed (32 percent) contains more dedicated/water features than any of the other four subwatersheds making up this pilot area. The Whites Branch subwatershed (5 percent) contains several large clusters of dedicated/water features that are mixed in with residential and commercial/industrial areas.



**Eagle Mountain Lake Boat Dock**

#### Commercial/Industrial

This category consists of office, retail, hotel/motel, large stadium, and industrial sites. Commercial/industrial is relatively insignificant (two percent) in this pilot area; however, there are larger clusters in the Henrietta Creek (five percent) and Whites Branch (three percent) subwatersheds. Examples include a business park with companies like Ford Motor Company, ATC Logistics and Electronics, and Entech Solar located around the Fort Worth Alliance Airport in the Henrietta Creek subwatershed. Other businesses like Safety Kleen Systems, Discount Steel, and All Brand Forklift Parts are densely populated along Saginaw Boulevard at the Dosier Creek/Whites Branch subwatershed border.

#### Infrastructure

This category consists of transportation, roadways, utilities, airports, and runways. Infrastructure (one percent) makes up the smallest land use category in this pilot area. There are large clusters in the Henrietta Creek (two percent), Dosier Creek (two percent), and Indian Creek (one percent) subwatersheds. The large clusters of infrastructure identified in Figure G.4 are airports and runways. For example, the Fort Worth Alliance Airport is located in the Henrietta Creek subwatershed, Hicks Airport is in the Dosier Creek subwatershed, and the Kenneth Copeland Airport is located just east of Eagle Mountain Lake in the Indian Creek subwatershed. Major roadways that intersect with these five subwatersheds include Interstate 35W, Interstate 820, U.S. Highway 287, SH 170, and U.S. Highway 377. Major railways include the BNSF Railway, which goes through the Whites Branch and Henrietta Creek subwatersheds, and the Cotton Belt Rail Line in the southeast part of the Whites Branch subwatershed.



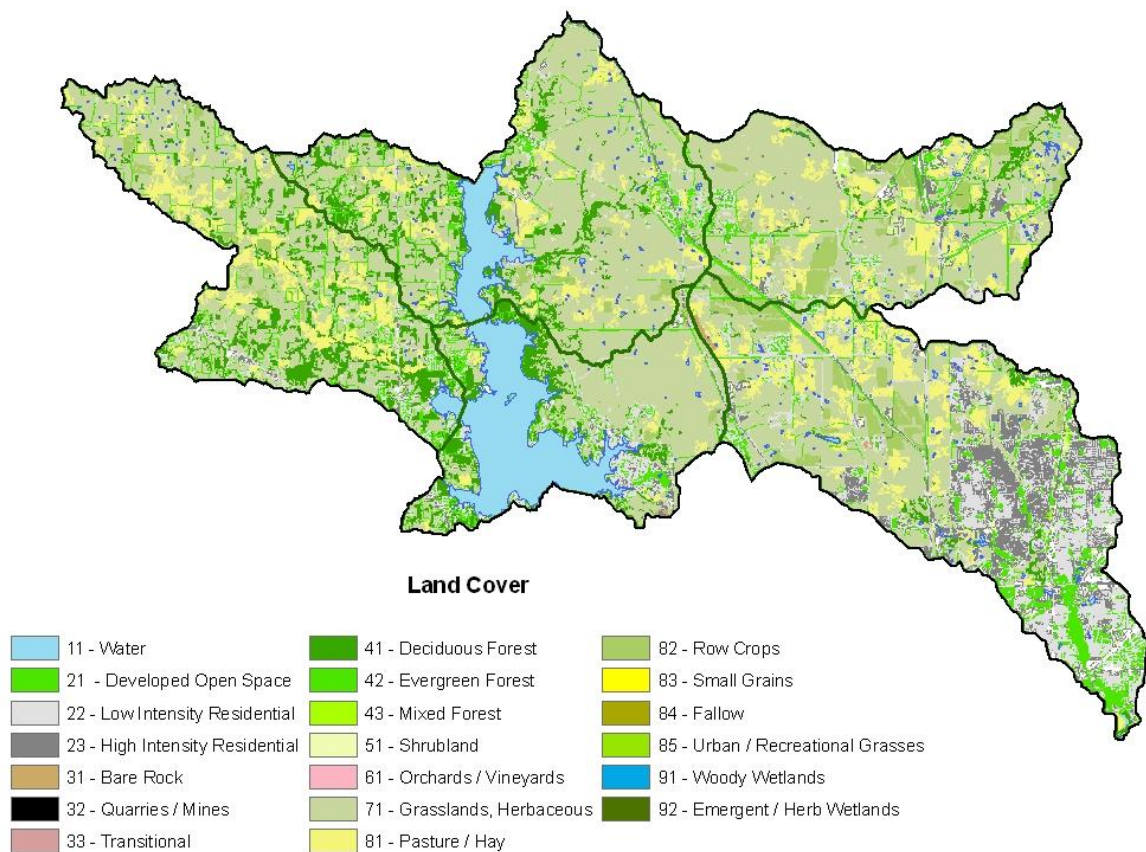
**Hicks Airfield Runway**

### Land Cover

The land cover types that define the SH 170 pilot area are depicted in Figure G.5. This data layer helps describe the land use categories previously discussed. The majority of land in the SH 170 pilot area is “undeveloped,” and this undeveloped land appears to be mostly characterized by grasslands/herbaceous and agricultural-related land cover classifications. There are also some forested areas. The large clusters of residential areas in the Whites Branch subwatershed are a mix of low and high intensity residential areas.

There is a 4-year difference in the land use and land cover data, so some areas may be recognized differently. For instance, the residential areas in the west part of the pilot area are not as prevalent in Figure G.5 as they appear in Figure G.4. This seems to indicate that the majority of these residential areas were constructed between 2001 and 2005. It appears as though grasslands, agricultural areas, and forested areas were converted to these residential areas.

**SH 170 Corridor Pilot Area: Land Cover**



**Figure G.5:** Land cover, identified in the legend by code and type, in the SH 170 Corridor Pilot Area as defined by the U.S. Geological Survey’s (USGS) 2001 National Land Cover Database (NLCD).

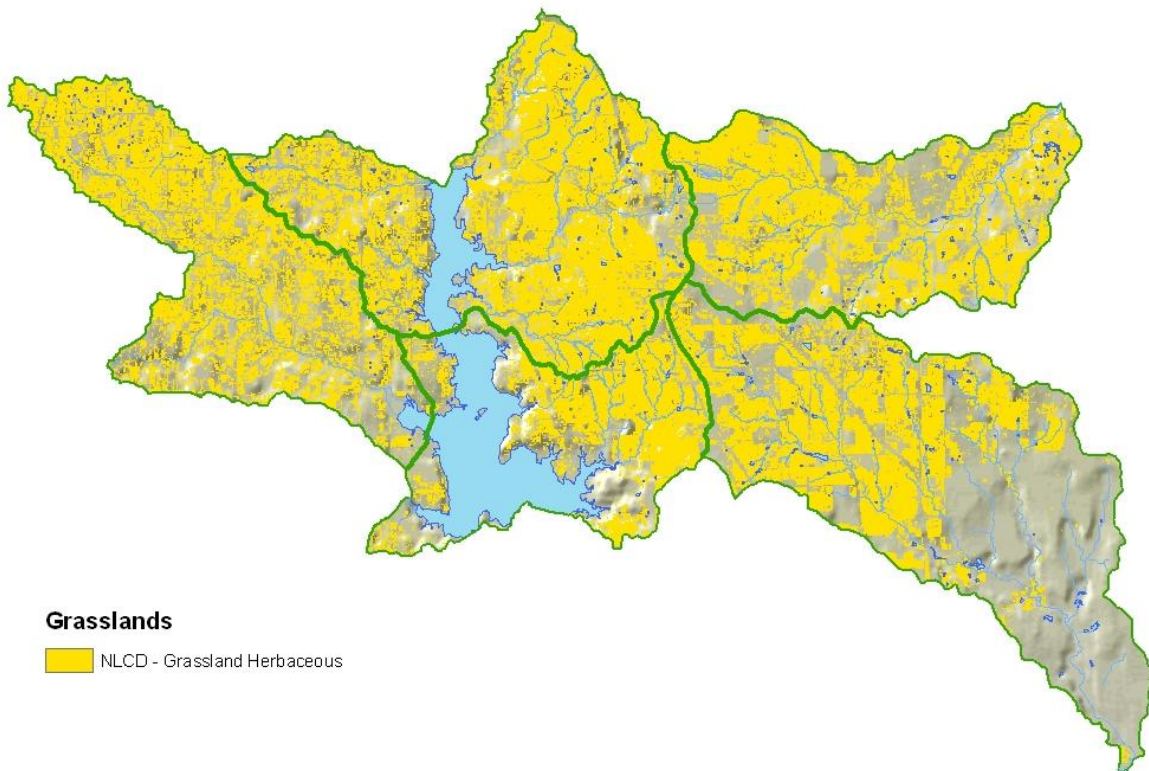
## Grasslands

The areas shaded yellow in Figure G.6 represent the NLCD's classification scheme 71, grasslands/herbaceous. Grasslands are native to this pilot area and provide critical habitat to a variety of species. This data may not differentiate between natural grassland and mowed grassland. The Lower Walnut Creek subwatershed appears to have more grasslands than the other four pilot subwatersheds, although as of 2005 some of this area had been converted to residential areas.



Grassy Area in Fort Worth East of Eagle Mountain Lake

## SH 170 Corridor Pilot Area: Grasslands



**Figure G.6:** Grasslands/herbaceous in the SH 170 Corridor Pilot Area represented by classification scheme 71 from the USGS's 2001 NLCD.

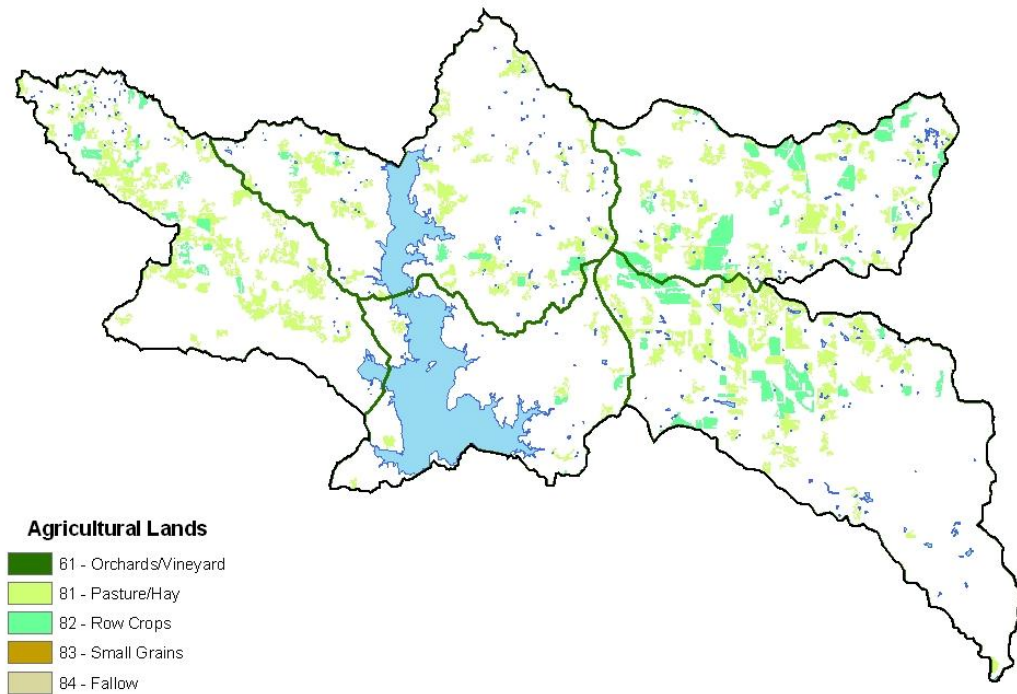
### Agricultural lands

The areas shaded tan, orange, and various tones of green in Figure G.7 represent agricultural-related land cover classifications schemes in the SH 170 pilot area. The majority of these lands are considered pasture/hay, which may be dedicated to the production of hay or may be inhabited by livestock. The other agricultural lands are for the production of food for humans and or animal feed. There are not any lands dedicated to orchards/vineyards, small grains, or fallow. It is possible that many small grains may also be considered row crops. In this pilot area, the eastern subwatersheds—Henrietta Creek and White's Branch—appear to have more agricultural lands than the western subwatersheds.



Pasture for Cattle Grazing

### SH 170 Corridor Pilot Area: Agricultural Lands



**Figure G.7:** Agricultural lands in the SH 170 Corridor Pilot Area represented by classification schemes 61, 81, 82, 83, and 84 from USGS's 2001 NLCD.

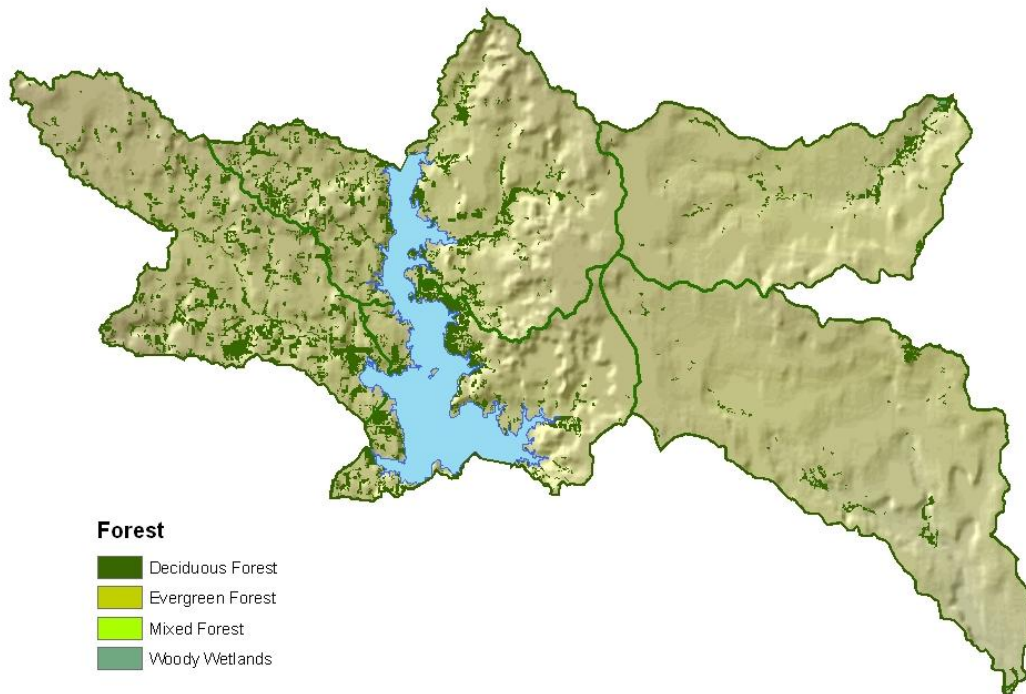
### Forested areas

The forested areas in the SH 170 pilot area are highlighted in Figure G.8 as various shades of green. The majority of these areas are in the pilot area's western subwatersheds—Lower Walnut Creek, Indian Creek, and Dosier Creek. Most are adjacent to Eagle Mountain Lake or appear to follow stream lines. For instance, the concentrated areas in the Henrietta Creek and Indian Creek subwatersheds correspond with the creeks. Forested areas may be part of the undeveloped landscape or a dedicated area such as a park. According to Figure G.8, deciduous trees dominate the forested landscape, although an October 2010 field visit to the pilot area suggests a mix of both deciduous and evergreen.



Trees Surrounding a Trail at Eagle Mountain Park

### SH 170 Corridor Pilot Area: Forested Areas



**Figure G.8:** Forested areas in the SH 170 Corridor Pilot Area represented by classification schemes 41, 42, 43, and 91 from USGS's 2001 NLCD.

### Water Resources

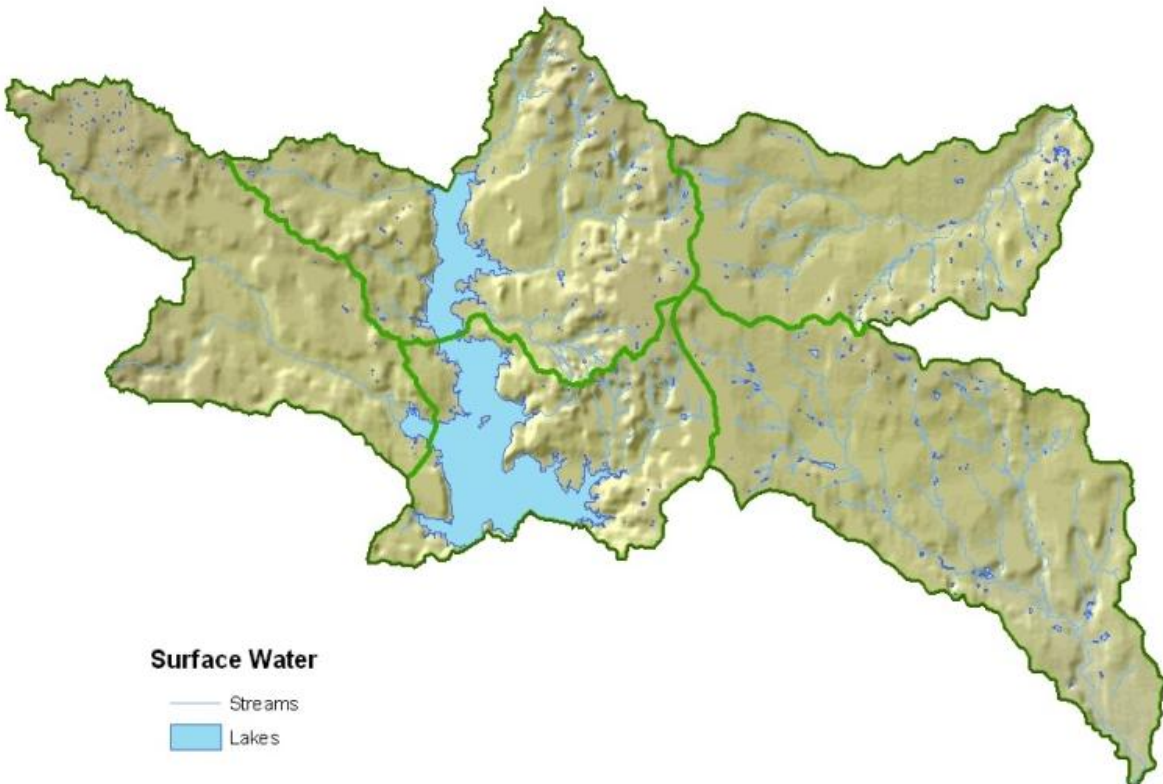


As discussed in the dedicated/water portion of the land use section, Eagle Mountain Lake, a major water supply lake in the North Central Texas region, is within the SH 170 pilot area. There are also several streams and small ponds present, but no recognized wetlands. See Figure G.9. The streams in the Lower Walnut Creek, Indian Creek, and Dosier Creek subwatersheds drain directly to Eagle Mountain Lake; the streams in the Henrietta Creek subwatershed drain to Grapevine Lake; the streams in the Whites Branch subwatershed drain to the West Fork of the Trinity River. There are and have been some water quality impairments and/or concerns in the pilot area. Communities and organizations are working to protect the water resources present through efforts such as best management practices, land conservation, and storm water management.



View of Eagle Mountain Lake from Eagle Mountain Park

#### SH 170 Corridor Pilot Area: Surface Water

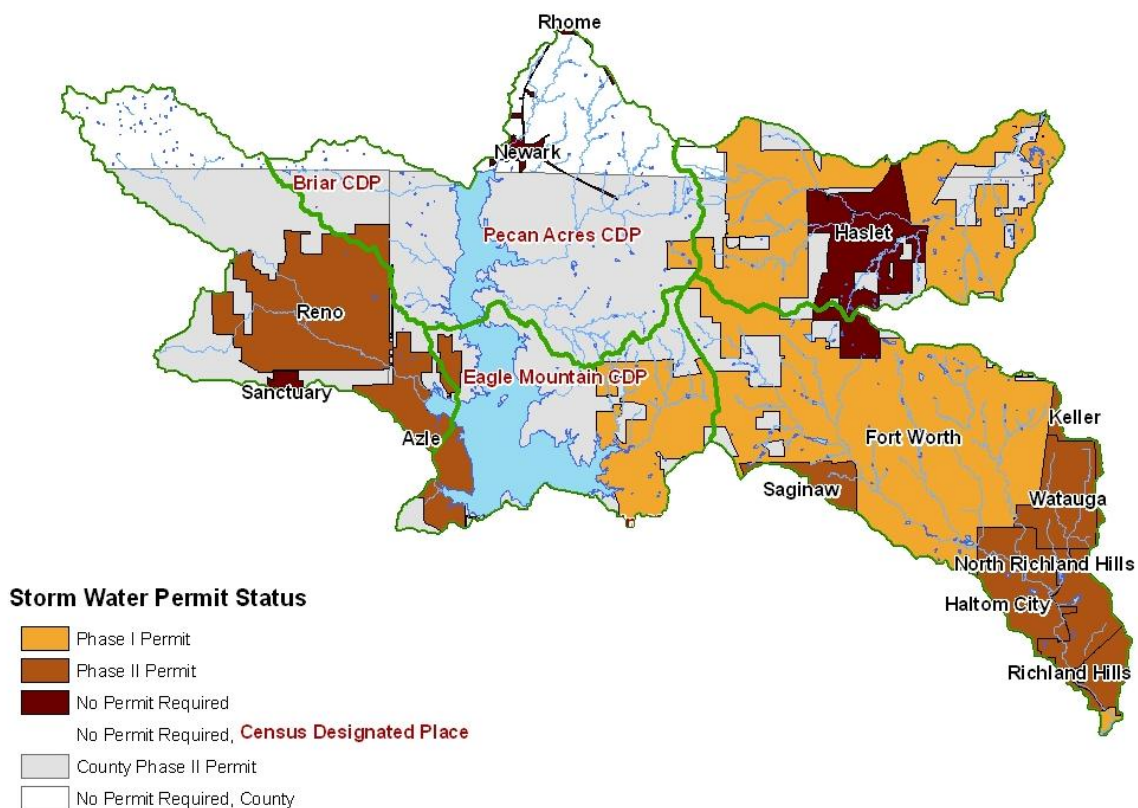


**Figure G.9:** Surface water in the SH 170 Corridor Pilot Area (USGS, National Hydrological Dataset). The large body of water is Eagle Mountain Lake.

According to TCEQ's 2008 303(d) list of impairments, none of the water segments within the subwatersheds of the SH 170 pilot area are currently impaired. However, the Whites Branch-Big Fossil Creek subwatershed drains to the West Fork of the Trinity River below Lake Worth, which is currently impaired for polychlorinated biphenyls (PCBs). Eagle Mountain Lake is on TCEQ's 2008 305(b) list of concerns for chlorophyll-a, ammonia, and dissolved oxygen.<sup>2</sup> Other sources site sediment loading, nutrient loading, and bacteria levels as current water quality concerns in Eagle Mountain Lake.

There are several efforts in the SH 170 pilot area to protect the water quality of lakes, rivers, creeks, and streams. For instance, the Tarrant Regional Water District and Texas AgriLife Extension Service are collaborating on the development of a Watershed Protection Plan to test best management practices that will reduce pollutant, like nutrients and sediment, runoff into Eagle Mountain Lake. Groups like Save Eagle Mountain Lake are also working to preserve and protect the ecological environment and quality of Eagle Mountain Lake and its watershed. In addition, 13 of the 21 communities, defined as Phase I or Phase II municipal separate storm sewer systems (MS4s), in the SH 170 pilot area are required to develop and implement storm water management programs to reduce the discharge of pollutants from the MS4 to local water bodies. See Figure G.10.

**SH 170 Corridor Pilot Area: Permitted MS4s**



**Figure G.10:** Storm water permit status for communities within the SH 170 pilot area. A permit is required for the following communities: Fort Worth, Azle, Haltom City, Keller, North Richland Hills, Pelican Bay, Reno, Richland Hills, Saginaw, Watauga, Denton County, Parker County, and Tarrant County. A permit is not required for the following communities: Briar CDP, Eagle Mountain CDP, Haslet, Newark, Sanctuary, Pecan Acres CDP, Rhome, and Wise County.

## Ecological Characteristics

The ecological characteristics of the SH 170 pilot area described in this section include a discussion of the ecoregion, ecologically important areas, and rare, threatened or endangered species present.

### Ecoregion

The SH 170 corridor pilot area is part of the Cross Timbers ecoregion, as defined by Omernik which are based on phenomena including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. This ecoregion is described as a transitional area between the once prairie, now winter wheat growing regions to the west, and the forested low mountains or hills of eastern Oklahoma and Texas. The region stretches from southern Kansas into central Texas, and contains irregular plains with some low hills and tablelands. It is a mosaic of forest, woodland, savanna, and prairie. The Cross Timbers ecoregion is not as arable or as suitable for growing corn and soybeans as the Central Irregular Plains to the northeast. The transitional natural vegetation of little bluestem grassland with scattered blackjack oak and post oak trees is used mostly for rangeland and pastureland, with some areas of woody plant invasion and closed forest. Oil production has been a major activity in this region for over eighty years.<sup>3</sup>

### Ecologically important areas

According to the U.S. Environmental Protection Agency's (EPA) Texas Ecological Assessment Protocol (TEAP) composite map for the SH 170 pilot area, there are more ecologically important areas on the western side of the pilot area. TEAP data are calculated according to Bailey's ecoregions and do not match up to the subwatershed boundaries. The more important areas are generally clustered around the banks of Eagle Mountain Lake as depicted by the darker shaded areas. The darkest areas with a score of five represent the top one percent highly ecologically important areas in Texas. See Figure G.11. This composite map is based on three ecological criteria—rarity, sustainability, and diversity. Rarity defines areas that have the highest number of rare species and land cover types; diversity refers to areas that have the most diverse land cover; and sustainability identifies areas that can sustain ecosystems now into the future.<sup>4</sup> These layers are mapped in Figure G.12, G.13, and G.14. The more rare and diverse areas appear to be clustered around the lake, and the more sustainable areas are north and west of the lake.

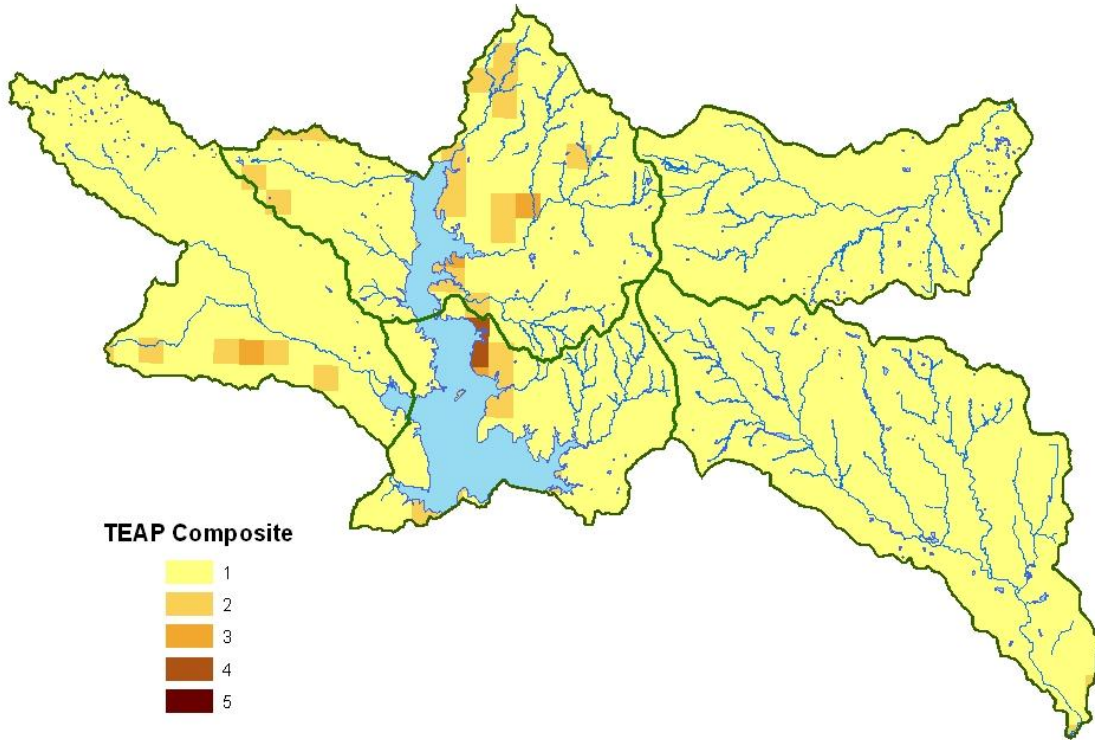


Information Display at Eagle Mountain Park  
Describing the Area's Ecoregion



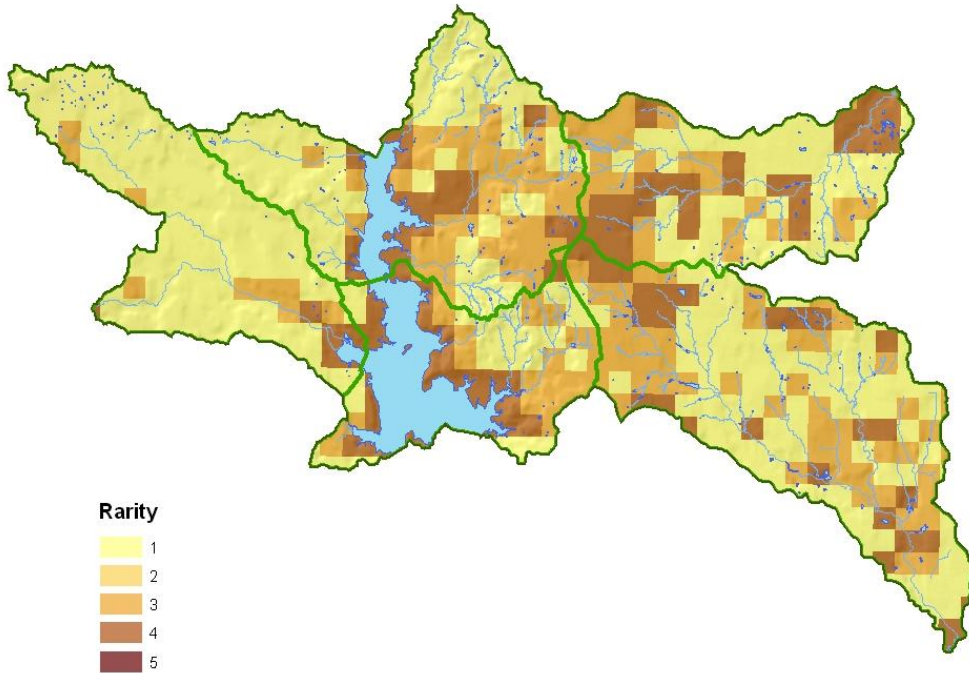
Ecologically Important Area East of Eagle  
Mountain Lake

### SH 170 Corridor Pilot Area: TEAP Composite



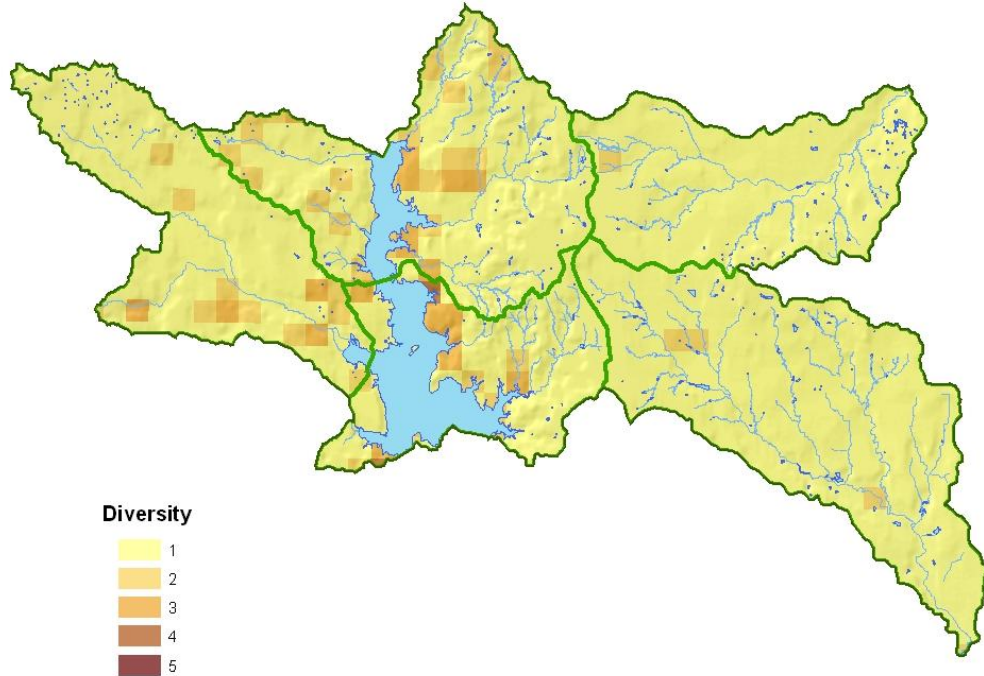
**Figure G.11:** Ecologically important areas in the SH 170 Corridor Pilot Area. The TEAP composite is based on three ecological criteria—rarity, sustainability, and diversity.<sup>4</sup> The darker areas are more ecologically important.

### SH 170 Corridor Pilot Area: REAP Rarity



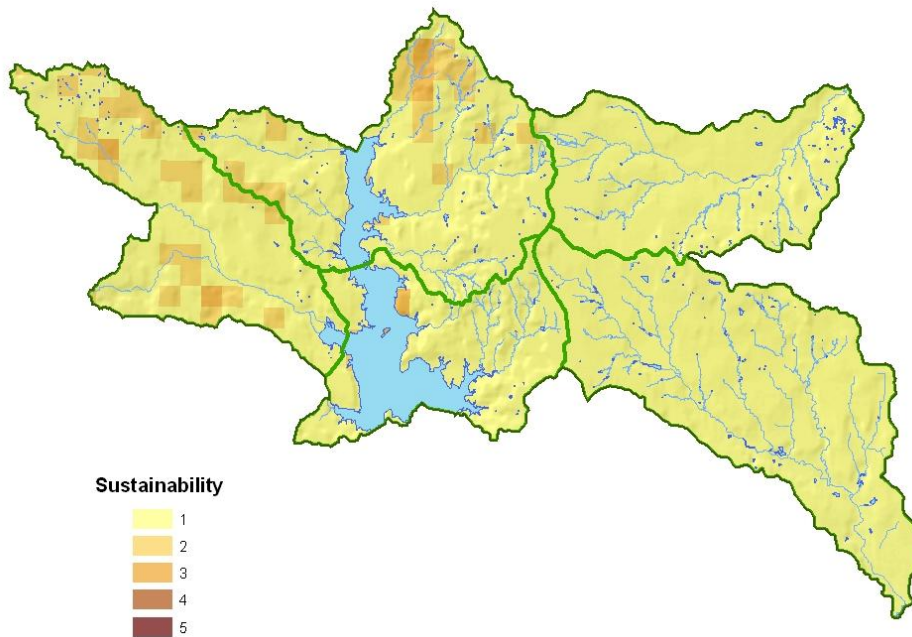
**Figure G.12:** REAP rarity in the SH 170 Corridor Pilot Area. This layer consists of four sub-layers: (1) vegetation rarity, (2) natural heritage rank, (3) taxonomic richness, and (4) rare species richness.<sup>4</sup> The darker shaded areas are higher in rarity.

**SH 170 Corridor Pilot Area: REAP Diversity**



**Figure G.13:** REAP diversity in the SH 170 Corridor Pilot Area. This layer consists of four sub-layers: (1) appropriateness of land cover, (2) contiguous size of undeveloped area, (3) Shannon land cover diversity, and (4) ecologically significant stream segments.<sup>4</sup> The darker shaded areas are higher in diversity.

**SH 170 Corridor Pilot Area: REAP Sustainability**



**Figure G.14:** REAP sustainability in the SH 170 Corridor Pilot Area. This layer consists of eleven measures that can be loosely grouped into fragmentors: (1) contiguous land cover type, (2) regularity of ecosystem boundary, (3) appropriateness of land cover, (4) waterway obstruction, and (5) road density and stressors: (1) airport noise, (2) Superfund National Priority List (NPL) and state Superfund Sites, (3) water quality, (4) air quality, (5) Resource Conservation and Recovery Act (RCRA) Treatment-Storage-Disposal sites (TSD), corrective action and state Voluntary Cleanup Program (VCP) Sites, and (6) urban/agricultural disturbance.<sup>4</sup> The darker shaded areas are higher in sustainability.

Rare, threatened, or endangered species

Texas Parks and Wildlife Department's (TPWD) database of rare, threatened, or endangered species of Texas are identified by county.<sup>5</sup> The SH 170 pilot area is located in northwest Tarrant County but also reaches into northeast Parker County, southeast Wise County, and southwest Denton County. The rare, threatened, or endangered species that may be present in this pilot area are identified in Table G.1. The types of habitat that these species may be found in are also listed.<sup>6</sup>

**Table G.1:** Rare, threatened, or endangered species that may be present the SH 170 Corridor Pilot Area, and their habitat type.

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
Denton, Parker, Wise	Birds	American Peregrine Falcon	<i>Falco peregrine anatum</i>	DL	T	Meadows, mudflats, beaches, marshes, lakes
Denton, Parker, Tarrant, Wise	Birds	Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL		Meadows, mudflats, beaches, marshes, lakes
Denton, Parker, Tarrant, Wise	Birds	Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T	Quiet coastal areas, rivers or lakeshores with large, tall trees
Parker	Birds	Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	LE	E	Woodlands with tall Ashe juniper, oaks, other hardwood trees
Denton, Parker, Tarrant	Birds	Henslow's Sparrow	<i>Ammodramus henslowii</i>			Tall-grass prairies
Parker, Tarrant	Birds	Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E	Sand & gravel bars within a wide unobstructed river channel, or open flats along shorelines of lakes & reservoirs
Parker, Wise	Birds	Mountain Plover	<i>Charadrius montanus</i>			Short grass & mixed grass prairie
Denton, Parker, Tarrant, Wise	Birds	Peregrine Falcon	<i>Falco peregrinus</i>	DL	T	High cliffs, often near water where prey species are most common
Denton, Parker, Tarrant, Wise	Birds	Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>			Open areas with mammal burrows; wide variety of arid & semi-arid environments, with well-drained, level to gently sloping areas characterized by sparse vegetation & bare ground
Denton	Birds	White-faced Ibis	<i>Plegadis chihi</i>		T	Marshes, swamps, ponds, rivers
Denton, Parker, Tarrant, Wise	Birds	Whooping Crane	<i>Grus americana</i>	LE	E	Dry prairie & flatwoods with saw palmetto, various grasses, scattered slash pine, & scattered strands of cypress

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
Denton	Birds	Wood Stork	<i>Mycteria americana</i>		T	Shallow water habitat found in swamps, marshes, ponds
Wise	Fishes	Blackside darter	<i>Percina maculata</i>		T	Small to medium-sized streams with moderate gradient, includes gravel riffles, chutes with steady flow, or pools; avoids large rivers
Parker	Fishes	Sharp-nose shiner	<i>Notropis oxyrinchus</i>	C		Moderate current velocities & depths; usually in areas with sand substrate
Tarrant, Wise	Fishes	Shovel-nose sturgeon	<i>Scaphirhynchus platyrhynchus</i>		T	Strong currents and deep channels of large rivers over sand & gravel substrates.
Parker	Fishes	Smalleye shiner	<i>Notropis buccula</i>	C		Common in river channels or periphery of channels in water with moderate depth & current velocities; substrate usually sand or silt; typically in turbid waters of broad, sandy channels of main stream, over substrate consisting mostly of shifting sand
Parker, Tarrant, Wise	Mammals	Gray wolf	<i>Canis lupus</i>	LE	E	Forests, brushlands, or grasslands where suitable cover & denning sites are available
Denton, Parker, Tarrant, Wise	Mammals	Plains spotted skunk	<i>Spilogale putorius interrupta</i>			Shrublands, open wooded lots, along streams & prairies
Denton, Parker, Tarrant, Wise	Mammals	Red wolf	<i>Canis rufus</i>	LE	E	Brushy & forested areas, coastal prairie & marsh habitat
Denton, Tarrant	Mollusks	Fawnsfoot	<i>Truncilla donaciformis</i>			Large rivers or lower reaches of medium-sized streams in sand or gravel
Denton, Tarrant, Wise	Mollusks	Little spect-aclecase	<i>Villosa lienosa</i>			Large, freshwater streams & rivers
Denton, Tarrant, Wise	Mollusks	Louisiana pigtoe	<i>Pleurobema riddellii</i>			Small numbers of living specimens have been found in the Neches River, some of its tributaries, & the Angelina River
Denton, Parker, Tarrant, Wise	Mollusks	Pistolgrip	<i>Tritogonia verrucosa</i>			Freshwater streams & rivers, avoids shifting sand
Denton, Parker, Tarrant, Wise	Mollusks	Rock pocket-book	<i>Arcidens confragosus</i>			Medium-sized rivers & backwater pools
Denton, Tarrant	Mollusks	Sandbank pocket-book	<i>Lampsilis satura</i>			Large, freshwater streams & rivers
Parker	Mollusks	Texas fawnsfoot	<i>Truncilla macrodon</i>			Brazos River between Possum Kingdom & the mouth of the Navasota River represents the only known surviving population
Denton, Tarrant, Wise	Mollusks	Texas heelsplitter	<i>Potamilus amphichaenus</i>			Large, freshwater streams & rivers; very rare

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
Denton	Mollusks	Wabash pigtoe	<i>Fusconaia flava</i>			Prefers gravel substrates & moderate currents
Parker, Wise	Plants	Comanche Peak prairie-clover	<i>Dalea reverchonii</i>			Shallow calcareous clay to sandy clay soils over limestone in grasslands or openings in post oak woodlands, often among sparse vegetation in barren exposed sites; most known sites are underlain by Goodland Limestone
Denton, Parker, Tarrant	Plants	Glen Rose yucca	<i>Yucca necopina</i>			Sandy soils of the Western Cross Timbers
Wise	Plants	Hall's baby bulrush	<i>Schoenoplectus hallii</i>			Ephemeral ponds on sandy to sandy loam or sandy clay soils
Parker	Reptiles	Brazos water snake	<i>Nerodia harteri</i>		T	Shallow riffles & rapids with rocky cover, dirt banks, rocky shorelines, woody vegetation near the river & adequate stream flows
Denton, Parker, Tarrant, Wise	Reptiles	Texas garter snake	<i>Thamnophis sirtalis annectens</i>			Dry, lightly wooded areas
Denton, Parker, Tarrant, Wise	Reptiles	Texas horned lizard	<i>Phrynosoma cornutum</i>		T	Arid & semiarid habitats in open areas with sparse plant cover; loose sand or loamy soils
Denton, Parker, Tarrant, Wise	Reptiles	Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>		T	Moist lowland forests & hilly woodlands or thickets near permanent water sources where tree stumps, logs & branches provide refuge

LE, LT: Federally Listed Endangered/Threatened

PE, PT: Federally Proposed Endangered/Threatened

SAE, SAT: Federally Listed Endangered/Threatened by Similarity of Appearance

C: Federal Candidate for Listing, formerly Category 1 Candidate

DL, PDL: Federally Delisted/Proposed for Delisting

NL: Not Federally Listed

E, T: State Listed Endangered/Threatened

NT: Not tracked or no longer tracked by the State

"Blank:" Rare, but with no regulatory listing status

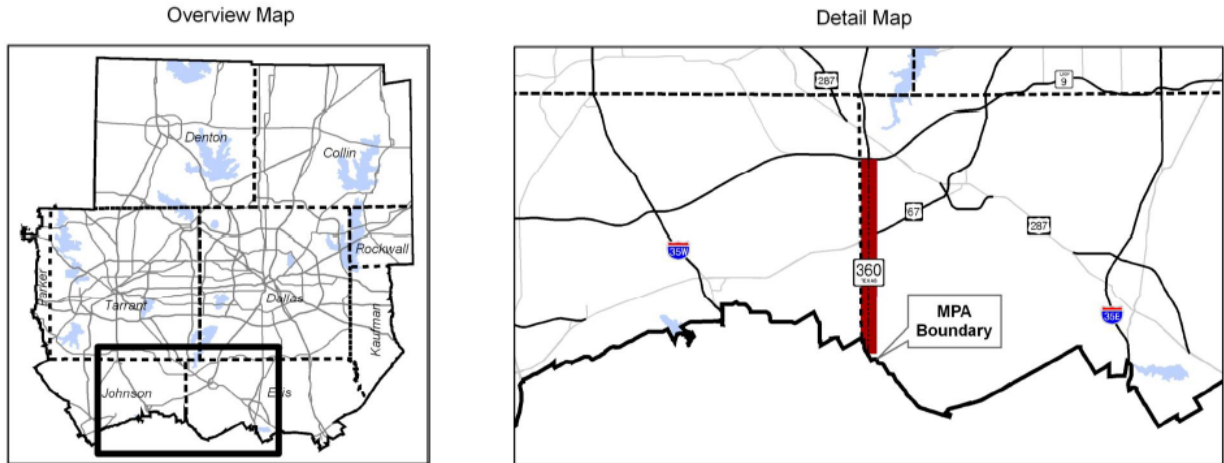


## State Highway 360 Corridor Pilot Area

### Location

The proposed State Highway (SH) 360 road segment is located in the Dallas-Fort Worth metropolitan area of North Central Texas. This segment is outlined in Mobility 2030 to extend the existing SH 360 system to be part of the future Dallas-Fort Worth Regional Outer Loop System connecting FM 2258 to the Outer Loop. See Figure G.15.

### SH 360 Corridor: Location



**Figure G.15:** Overview map and detailed map of the SH 360 corridor as presented in Mobility 2030.<sup>1</sup>

The proposed SH 360 corridor lies within three subwatersheds, and includes the Headwaters Mountain Creek, Soap Creek, and Armstrong Creek-Cottonwood Creek subwatersheds. See Figure G.16. The SH 360 corridor pilot area is located in northeast Johnson County and northwest Ellis County with portions falling within the boundaries of the following cities: Alvarado, Grand Prairie, Mansfield, Midlothian, and Venus. The City of Midlothian occupies more land in the pilot area than any other city; however, the majority of land is unincorporated. See Figure G.17.



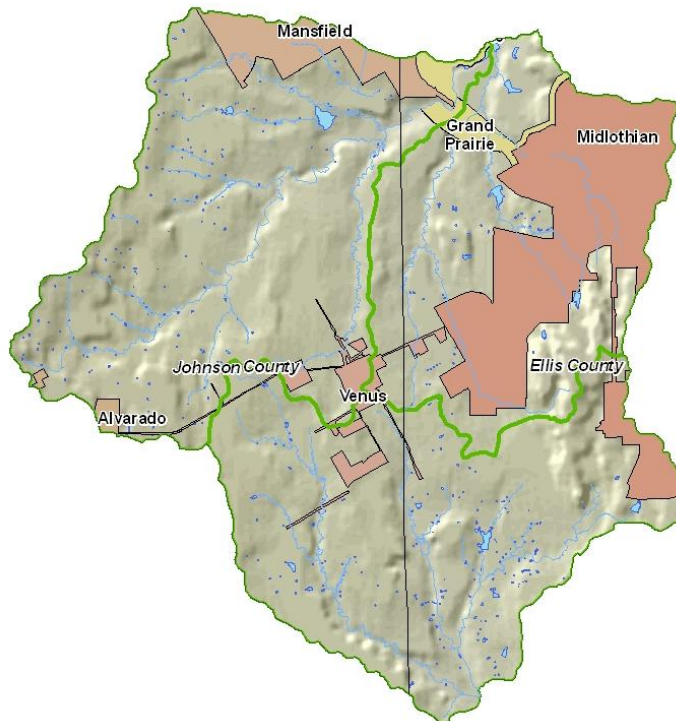
**City of Venus Offices and Water Tower**

### SH 360 Corridor Pilot Area: Subwatersheds



**Figure G.16:** The three subwatersheds that make up the SH 360 Corridor Pilot Area—Headwaters Mountain Creek, Soap Creek, and Armstrong Creek-Cottonwood Creek subwatersheds.

### SH 360 Corridor Pilot Area: Communities

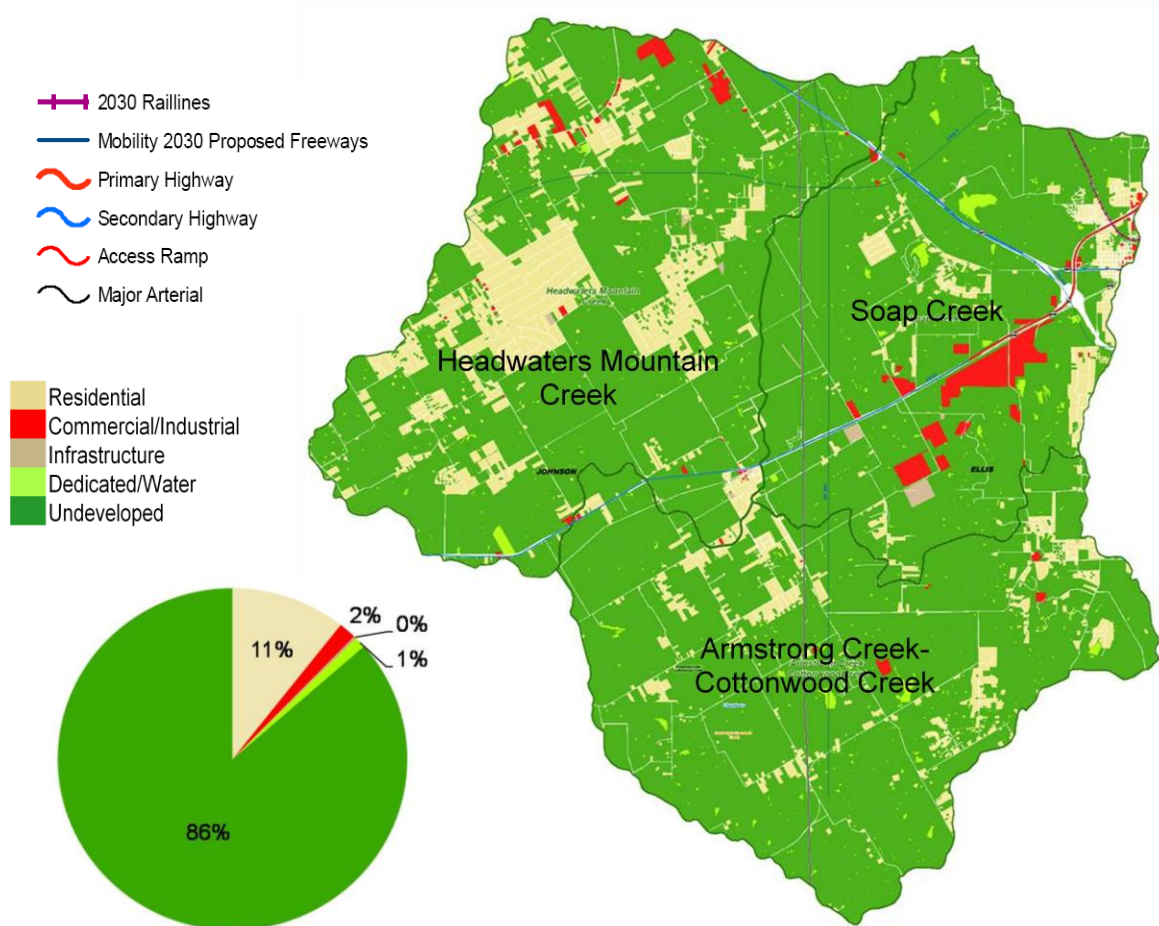


**Figure G.17:** The communities within the SH 360 Corridor Pilot Area—Alvarado, Grand Prairie, Mansfield, Midlothian, Venus, Ellis County, and Johnson County.

Land Use

The dominating land use category in the SH 360 pilot area is undeveloped land (86 percent), followed by residential (11 percent), commercial/industrial (two percent), dedicated/water (one percent), and infrastructure (0.25 percent). See Figure G.18. The north part of the pilot area, which is closer to the urban core of the Dallas-Fort Worth metroplex, is more developed than the south.

SH 360 Corridor: 2005 Land Use by Category



**Figure G.18:** 2005 land use by category (residential, commercial/industrial, infrastructure, dedicated/water, and undeveloped) in the SH 360 Corridor Pilot Area. The pie chart breaks down the total amount of land use in the three subwatersheds by category.

Undeveloped

This category consists of areas that are vacant, under construction, or parking lots/garages. Most of the undeveloped land in this pilot area is located in the Armstrong Creek-Cottonwood Creek (92 percent) and Soap Creek (89 percent) subwatersheds. The Headwaters Mountain Creek subwatershed contains the least amount at 80 percent.

Residential

This category consists of areas serving as single family housing, multi-family housing, mobile homes, group quarters, and institutional facilities. Residential areas are present in all three subwatersheds; however, Headwaters-Mountain Creek contains the most at 18 percent. Large clusters of residential

areas are located in the central part of this subwatershed, which appears to be an unincorporated area in Johnson County. Other clusters of residential areas are located in the north (Venus area) and east parts (Midlothian area) of the Armstrong Creek-Cottonwood Creek subwatershed and the east part (Midlothian area) of the Soap Creek subwatershed.

#### Commercial/Industrial

This category consists of office, retail, hotel/motel, large stadium, and industrial sites. While little land is designated as commercial/industrial sites in this pilot area, they are heavily concentrated in the Midlothian area located in the central to east part of Soap Creek subwatershed (four percent). There are several heavy industries present such as Texas Industries and Chaparral Steel, where cement, aggregate, and consumer product building materials, and steel are made, respectively. The Headwaters Mountain Creek subwatershed (one percent) has some commercial/industrial areas in the north, which appear to be more commercial-type establishments than heavy industry. This land use category is the third most common land use type in the SH 360 pilot area.



**New Residential Development**



**Texas Industries in Midlothian**

#### Dedicated/water

This category consists of parks, recreational areas, landfills, flood control areas, or surface water. There are very few dedicated/water features in the SH 360 pilot area. The Soap Creek watershed contains the most at almost two percent. The large features that can be seen in Figure G.18 are small Soil Conservation Service Site Reservoirs or appear to be private “tanks.” At least three Soil Conservation Service Site Reservoirs—9, 10, 49a—are located within this pilot area. Sites 9 and 10 are in the Soap Creek subwatershed and site 49a is in the Armstrong Creek-Cottonwood Creek subwatershed. Tanks are small manmade ponds that are used for recreational or agricultural purposes. There are a couple streams stemming from Joe Pool Lake just north of the pilot area that wind through the pilot subwatersheds.

#### Infrastructure

This category consists of transportation, roadways, utilities, airports, and runways. Infrastructure (0.25 percent) is the least common land use category in this pilot area; however, there are a couple larger sites in the Soap Creek subwatershed (one percent). One of those sites is the Tsa Gliderport Airport, a small private airport. Major roadways that intersect with these three



**U.S. Route 67 Near Midlothian**

subwatersheds include U.S. Route 67 and U.S. Highway 287. The majority of roadways are “farm-to-market” roads, which typically connect rural or agricultural areas to market towns.

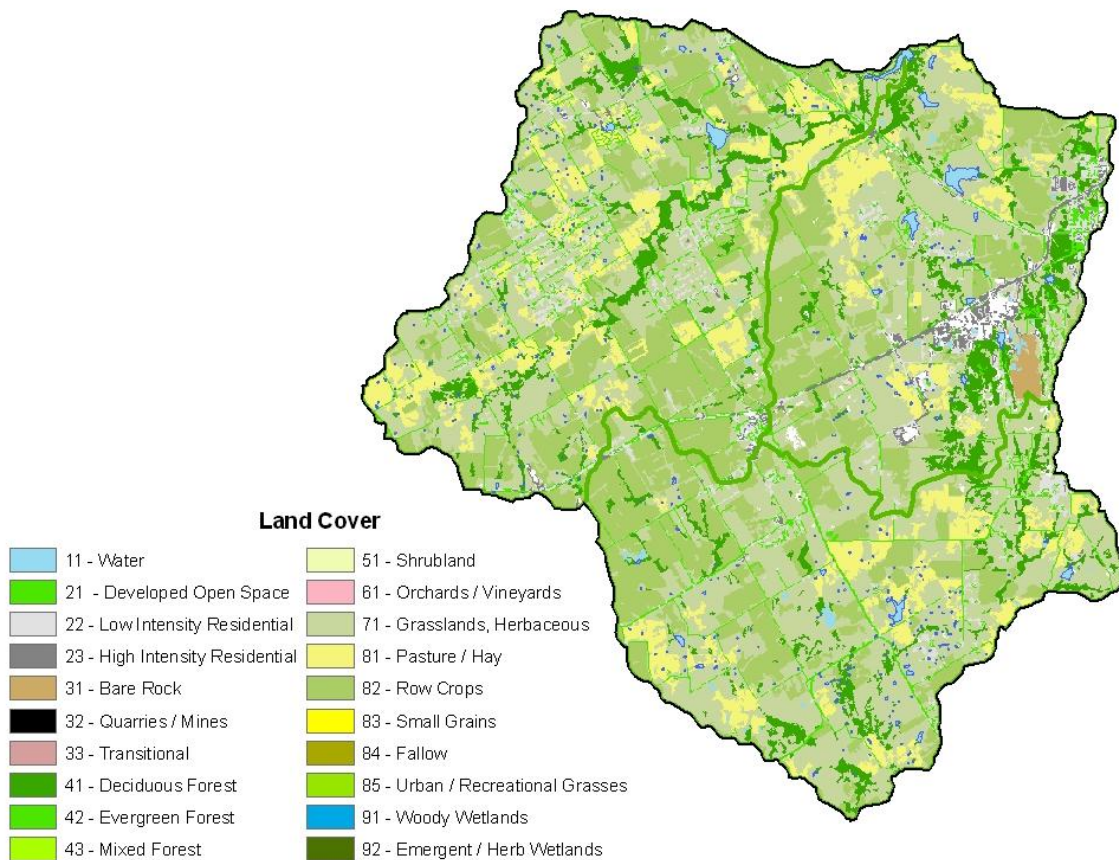
### Land Cover

The land cover types that define the SH 360 pilot area are depicted in Figure G.19. This data layer helps describe the land use categories previously discussed. The majority of land in the SH 360 pilot area is “undeveloped,” and this undeveloped land appears to be mostly characterized by grasslands/herbaceous and agricultural-related land cover classifications. There are also some forested areas.

There is a 4-year difference in the land use and land cover data, so some areas may be recognized differently. For instance, the large residential area in the Headwaters Mountain Creek subwatershed in 2005 (Figure G.18) do not appear to have existed in 2001 (Figure G.19). This seems to indicate that this residential area was constructed between 2001 and 2005. It appears as though grasslands, agricultural lands, and forested areas were converted to this residential area.

There also appears to be some discrepancy in the data and what is present in the field. For instance, the area identified as residential in the Soap Creek subwatershed in Figure G.19 is commercial/industrial in Figure G.18. An October 2010 field visit verified this area as commercial/industrial with no evidence to suggest that it ever was a residential area.

### SH 360 Corridor Pilot Area: Land Cover

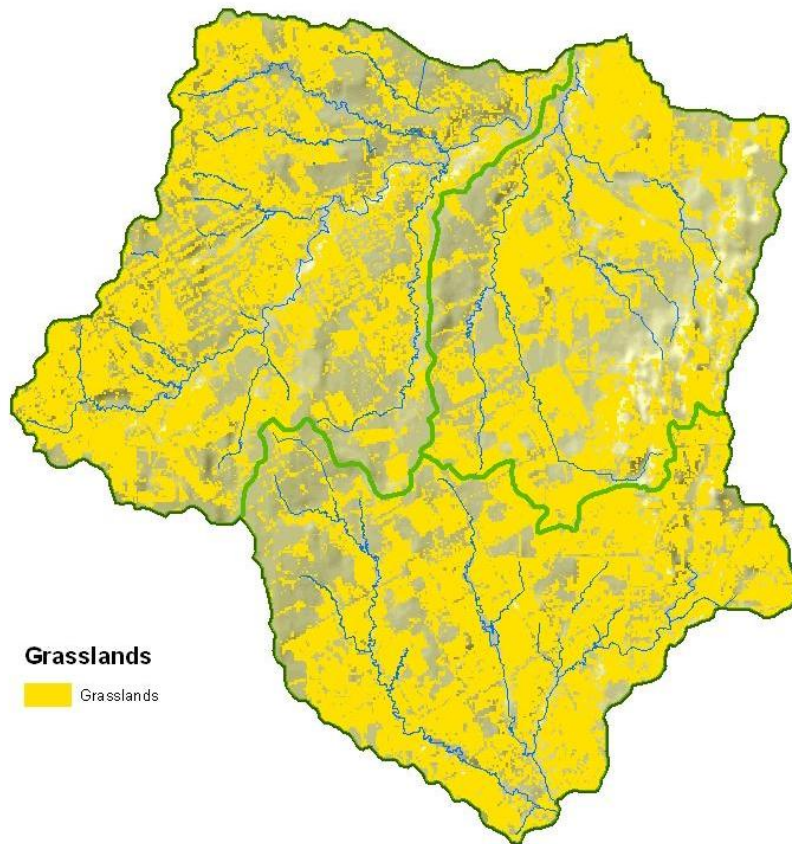


**Figure G.19:** Land cover, identified in the legend by code and type, in the SH 360 Corridor Pilot Area as defined by the U.S. Geological Survey’s (USGS) 2001 National Land Cover Database (NLCD).

### Grasslands

The areas shaded yellow in Figure G.20 represent the NLCD's classification scheme 71, grasslands/herbaceous. Grasslands are native to this pilot area's landscape and provide critical habitat to a variety of species. This data may not differentiate between natural grassland and mowed grassland. The Armstrong-Cottonwood Creek subwatershed appears to have more grasslands than the other two pilot subwatersheds.

### SH 360 Corridor Pilot Area: Grasslands



**Figure G.20:** Grasslands/herbaceous in the SH 360 Corridor Pilot Area represented by classification scheme 71 from USGS's 2001 NLCD.

### Agricultural lands

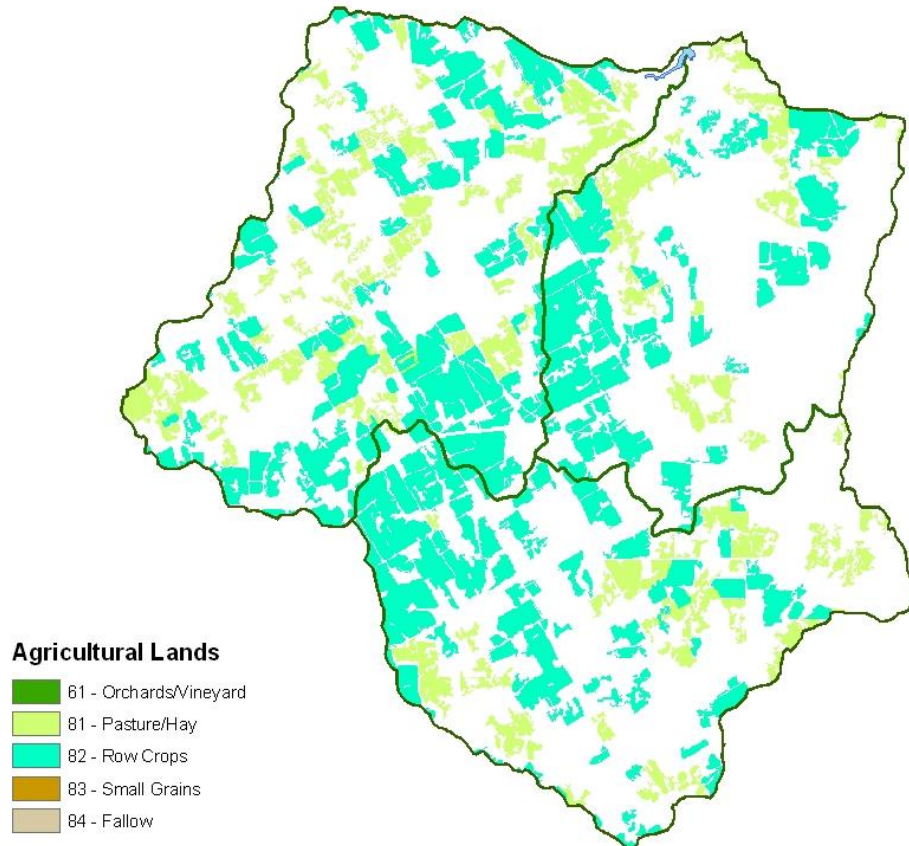
The areas shaded tan, orange, and various tones of green in Figure G.21 represent agricultural-related land cover classifications schemes in the SH 360 pilot area. The majority of these lands are dedicated to the production of row crops, such as corn and sorghum. The other agricultural lands are considered pasture/hay, which may be dedicated to the production of hay or may be inhabited by livestock. A large ranch with cattle, buffalo, turkeys, and other animals raised for human consumption was discovered in Venus during an October 2010 field visit. Agricultural



**Hay Field Outside of Grand Prairie**

lands are, for the most part, evenly scattered throughout the pilot area; however, it is not as common in the Midlothian area (Soap Creek subwatershed) where residential and commercial/industrial land uses are more common. There are not any lands dedicated to orchards/vineyards, small grains, or fallow. It is possible that many small grains may also be considered row crops.

### SH 360 Corridor Pilot Area: Agricultural Lands



**Figure G.21:** Agricultural lands in the SH 360 Corridor Pilot Area represented by classification schemes 61, 81, 82, 83, and 84 from USGS's 2001 NLCD.

### Forested areas

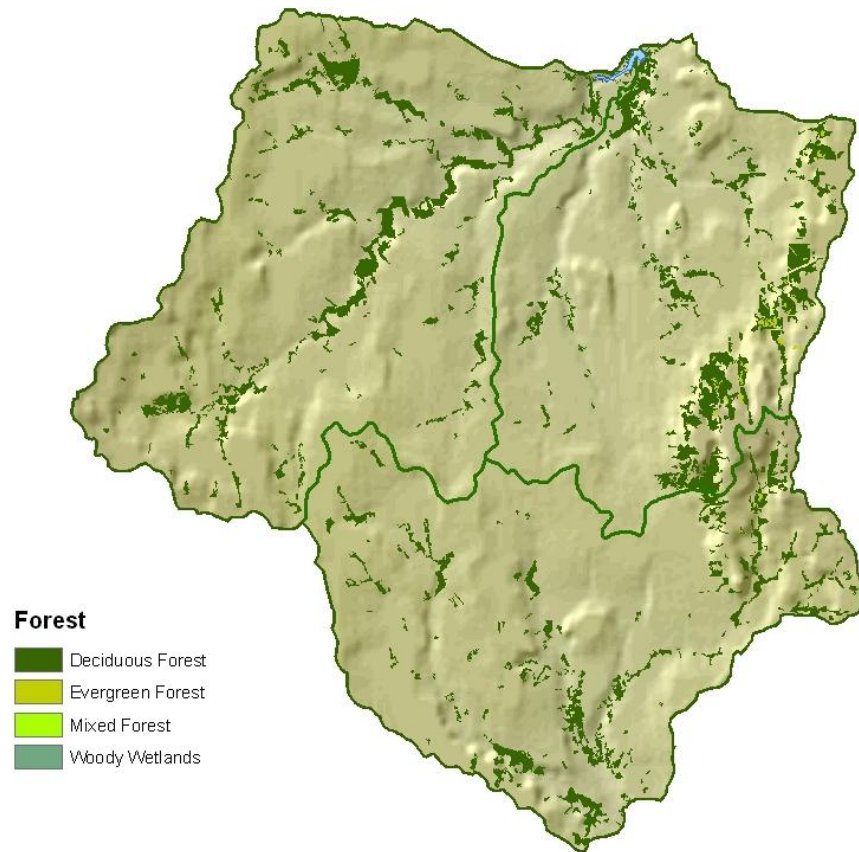
The forested areas in the SH 360 pilot area are highlighted in Figure G.22 as various shades of green. Deciduous trees dominate the forested landscape, although some mixed forests are particularly visible in the east part of the Soap Creek subwatershed. Large clusters of forested areas correspond with the streams stemming from Joe Pool Lake in the north part of the Headwaters Mountain Creek and Soap Creek subwatersheds. Other large clusters are adjacent to the highly industrialized area near Midlothian in the Soap Creek subwatershed. This area is also more ecologically important than any other area in



**Forested Area South of Texas Industries**

the SH 360 pilot subwatersheds. See the section below titled “ecological characteristics.”

### SH 360 Corridor Pilot Area: Forested Areas



**Figure G.22:** Forested areas in the SH 360 Corridor Pilot Area represented by classification schemes 41, 42, 43, and 91 from USGS’s 2001 NLCD.

#### Water Resources

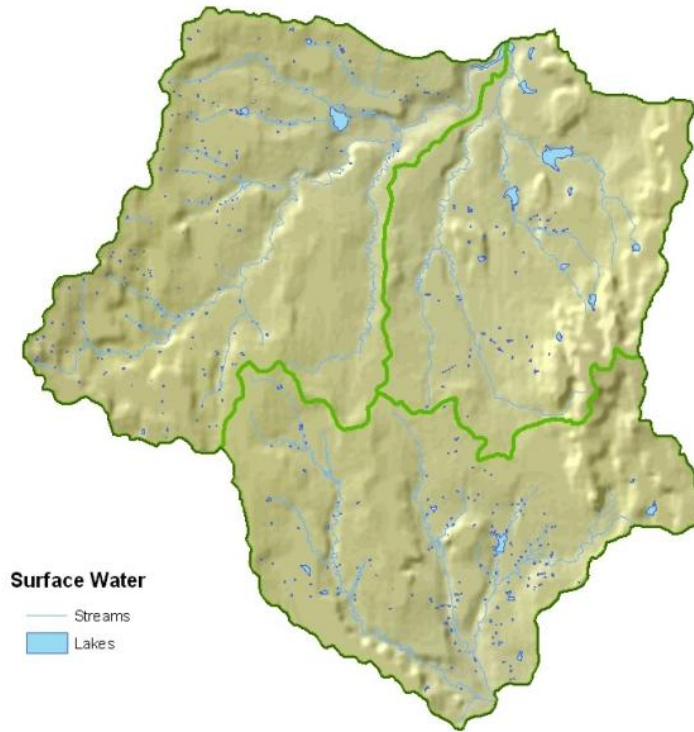
There are no major water bodies, i.e. lakes or rivers, in the SH 360 pilot area. Joe Pool Lake, a major water supply lake in the North Central Texas region, is just north of the Headwaters Mountain Creek and Soap Creek subwatersheds. There are several streams and small ponds present, but no recognized wetlands. See Figure G.23. A couple of these streams stem from Joe Pool Lake and wind through the Headwaters Mountain Creek and Soap Creek subwatersheds. The streams in the Armstrong Creek-Cottonwood Creek subwatershed eventually drain to Richland Chambers Lake. As discussed in the “dedicated/water” portion of the land use section, there are at least three Soil Conservation Service Site Reservoirs—9, 10, 49a—located within this pilot area. Sites 9 and 10 are in the Soap Creek subwatershed and site 49a is in the Armstrong Creek-Cottonwood Creek subwatershed.



**Stream Off Highway 287 Near Mansfield**

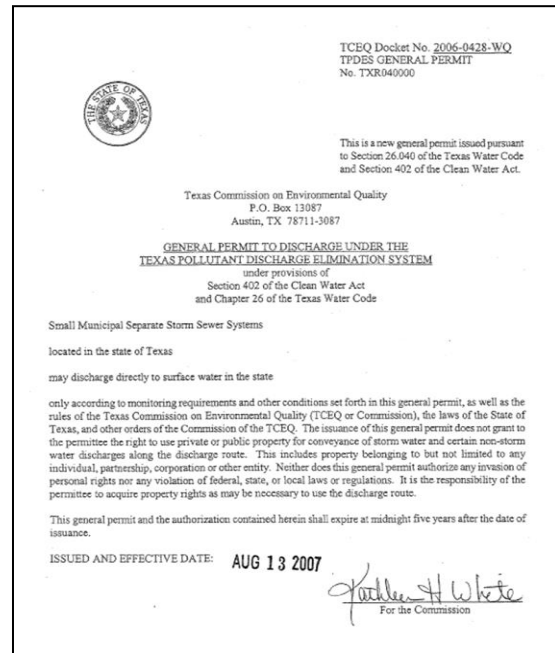


### SH 360 Corridor Pilot Area: Surface Water



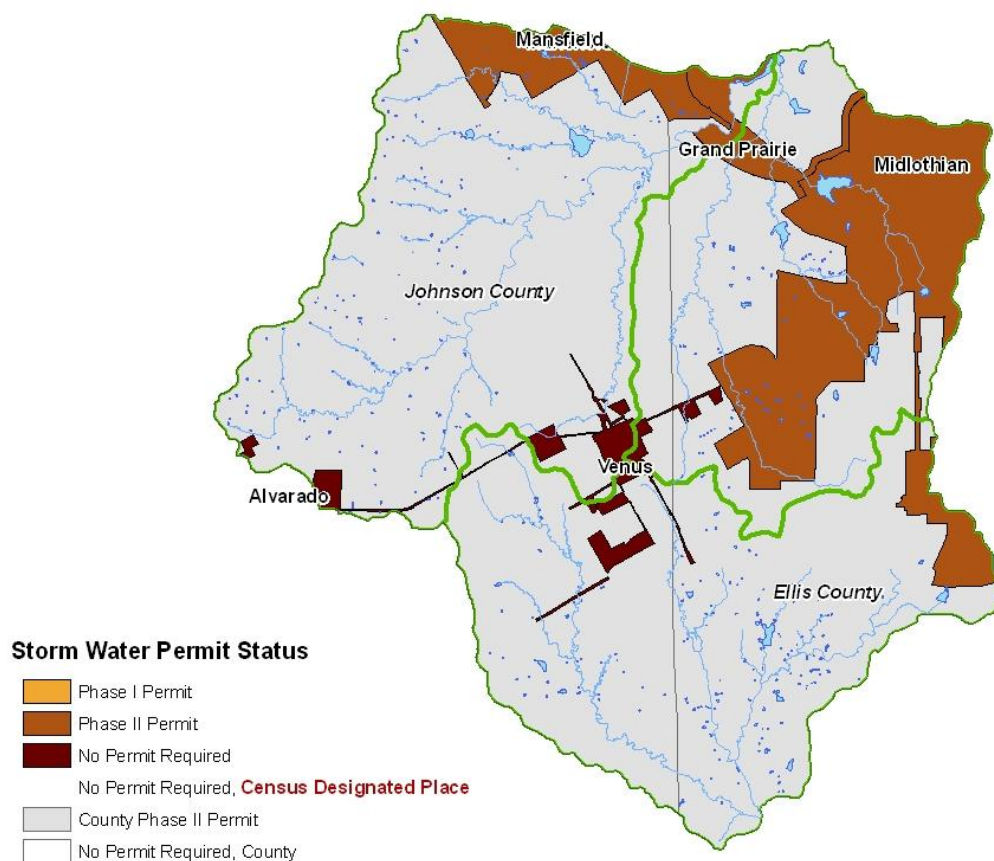
**Figure G.23:** Surface water in the SH 360 Corridor Pilot Area (USGS, National Hydrological Dataset).

According to TCEQ's 2008 303(d) list of impairments, none of the water segments within the subwatersheds of the SH 360 pilot area are currently impaired. In addition, there are no 2008 305(b) listed water quality concerns.<sup>2</sup> Five of the seven communities, defined as Phase I or Phase II municipal separate storm sewer systems (MS4s), in the SH 360 pilot area are required to develop and implement storm water management programs to reduce the discharge of pollutants from the MS4 to local water bodies. See Figure G.24. Other than these ongoing efforts, there appear to be no recognized projects or watershed protection plans in place to protect the area's water resources.



Cover page of General Permit TXR040000 for Phase II MS4s

### SH 360 Corridor Pilot Area: Permitted MS4s



**Figure G.24:** Storm water permit status for communities within the SH 360 pilot area. A permit is required for the following communities: City of Grand Prairie, City of Mansfield, City of Midlothian, Ellis County, and Johnson County. A permit is not required for the following communities: City of Alvarado and City of Venus.

#### Ecological Characteristics

The ecological characteristics of the SH 360 pilot area described in this section include a discussion of the ecoregion, ecologically important areas, and rare, threatened, or endangered species present.

#### Ecoregion

The SH 360 corridor pilot area is part of the Texas Blackland Prairies ecoregion, as defined by Omernik which are based on phenomena including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The Texas Blackland Prairies form a disjunct ecological region, distinguished from surrounding regions by fine-textured, clayey soils and predominantly prairie potential natural vegetation. The predominance of Vertisols in this area is related to soil formation in Cretaceous shale, chalk, and marl parent materials. Unlike tallgrass prairie soils that are mostly Mollisols in states to the north, this region contains Vertisols, Alfisols, and Mollisols. Dominant grasses included little bluestem, big bluestem, yellow Indiangrass, and switchgrass. This region now contains a higher percentage of cropland than adjacent regions; pasture and forage production for livestock is common. Large areas of the region are being converted to urban and industrial uses. Typical game species include mourning dove and northern bobwhite on uplands and eastern fox squirrel along stream bottomlands.<sup>3</sup>

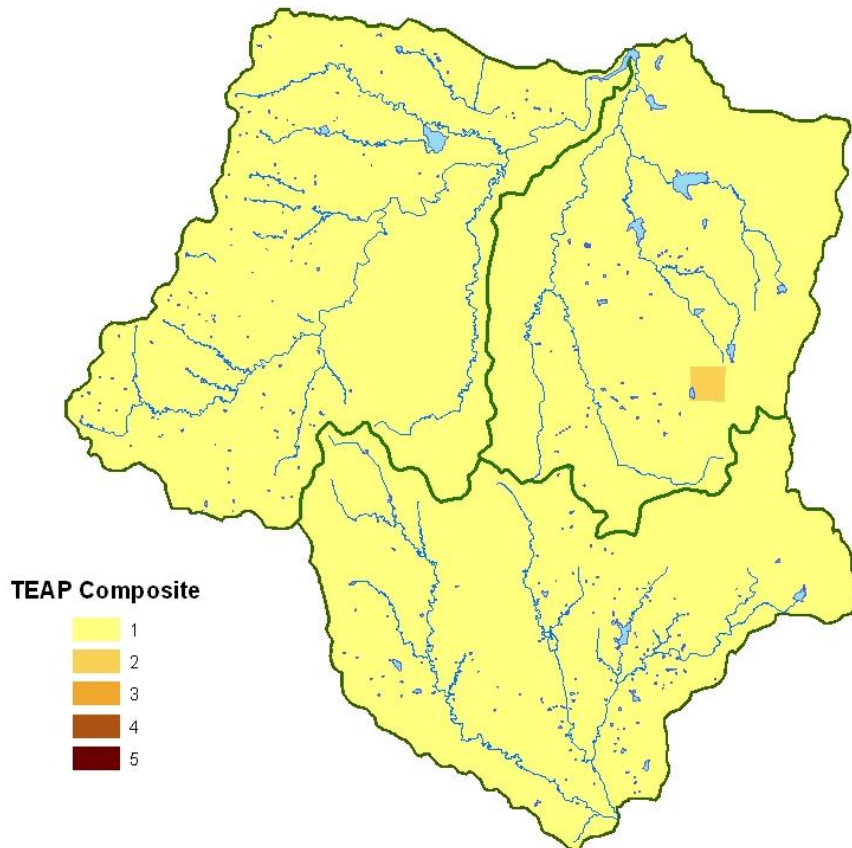
### Ecologically important areas

According to the U.S. Environmental Protection Agency's (EPA) Texas Ecological Assessment Protocol (TEAP) composite map for the SH 360 pilot area, there are not any highly ecologically important areas in the three pilot subwatersheds. TEAP data are calculated according to Bailey's ecoregions and do not match up to the subwatershed boundaries. The more ecologically important areas, as depicted by the darker shaded areas, are located in the Soap Creek subwatershed. When overlaid with transportation networks, it appears as though this area is just south of the highly commercialized/industrialized area off highway 67 in Midlothian. The red areas with a score of five, which are not present in the composite map of the SH 360 pilot area, represent the top one percent highly ecologically important areas in Texas. See Figure G.25. This composite map is based on three ecological criteria—rarity, diversity, and sustainability. Rarity defines areas that have the highest number of rare species and land cover types; diversity refers to areas that have the most diverse land cover; and sustainability identifies areas that can sustain ecosystems now into the future.<sup>4</sup> These layers are mapped in Figure G.26, G.27, and G.28. There appears to be no obvious trend with the location of rare, diverse, or sustainable areas in this pilot.

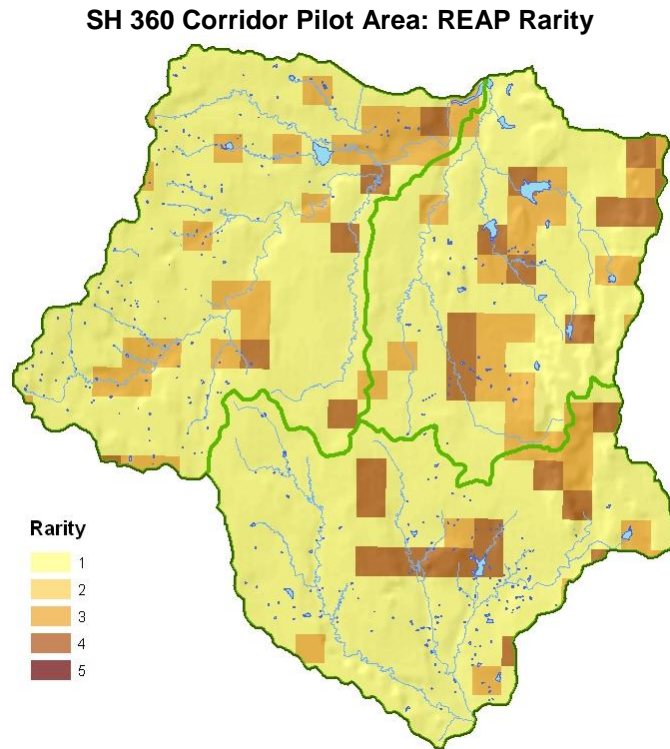


Ecologically Important Area in Midlothian

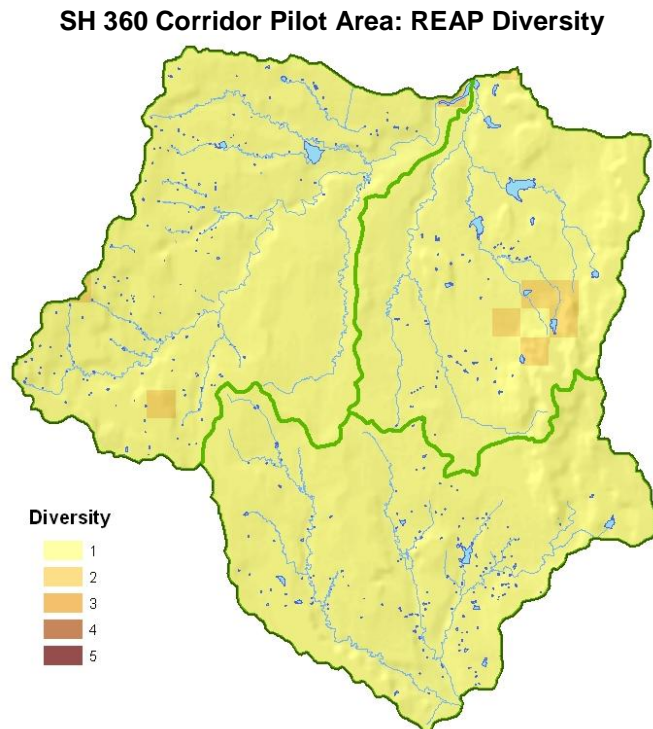
### SH 360 Corridor Pilot Area: TEAP Composite



**Figure G.25:** Ecologically important areas in the SH 360 Corridor Pilot Area. The TEAP composite is based on three ecological criteria—rarity, sustainability, and diversity.<sup>4</sup> The darker areas are more ecologically important.

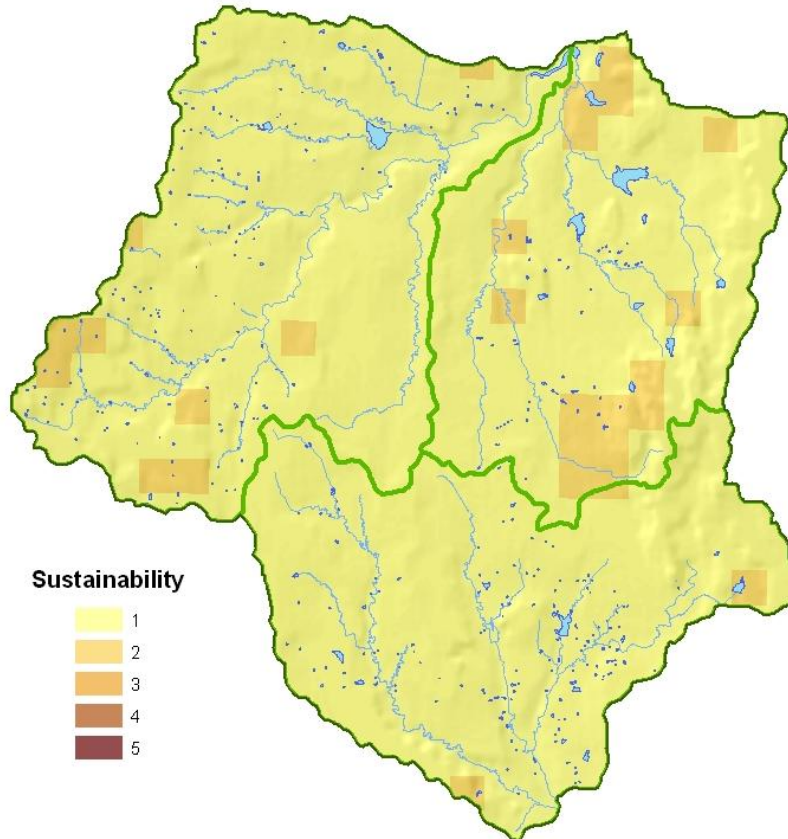


**Figure G.26:** REAP rarity in the SH 360 Corridor Pilot Area. This layer consists of four sub-layers: (1) vegetation rarity, (2) natural heritage rank, (3) taxonomic richness, and (4) rare species richness.<sup>4</sup> The darker shaded areas are higher in rarity.



**Figure G.27:** REAP diversity in the SH 360 Corridor Pilot Area. This layer consists of four sub-layers: (1) appropriateness of land cover, (2) contiguous size of undeveloped area, (3) Shannon land cover diversity, and (4) ecologically significant stream segments.<sup>4</sup> The darker shaded areas are higher in diversity.

### SH 360 Corridor Pilot Area: REAP Sustainability



**Figure G.28:** REAP sustainability in the SH 360 Corridor Pilot Area. This layer consists of eleven measures that can be loosely grouped into fragmentors: (1) contiguous land cover type, (2) regularity of ecosystem boundary, (3) appropriateness of land cover, (4) waterway obstruction, and (5) road density and stressors: (1) airport noise, (2) Superfund National Priority List (NPL) and state Superfund Sites, (3) water quality, (4) air quality, (5) Resource Conservation and Recovery Act (RCRA) Treatment-Storage-Disposal sites (TSD), corrective action and state Voluntary Cleanup Program (VCP) Sites, and (6) urban/agricultural disturbance.<sup>4</sup> The darker shaded areas are higher in sustainability.

#### Rare, threatened, or endangered species

Texas Parks and Wildlife Department's (TPWD) database of rare, threatened, or endangered species of Texas are identified by county.<sup>5</sup> The SH 360 pilot area is located in northeast Johnson County and northwest Ellis County. The rare, threatened, or endangered species that may be present in this pilot area are identified in Table G.2. The types of habitat that these species may be found in are also listed.<sup>6</sup>

**Table G.2:** Rare, threatened, or endangered species that may be present in the SH 360 Corridor Pilot Area, and their habitat type.

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
Ellis, Johnson	Birds	American Peregrine Falcon	<i>Falco peregrine anatum</i>	DL	T	Meadows, mudflats, beaches, marshes, lakes
Ellis, Johnson	Birds	Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL		Meadows, mudflats, beaches, marshes, lakes
Ellis, Johnson	Birds	Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T	Quiet coastal areas, rivers or lakeshores with large, tall trees
Johnson	Birds	Black-capped Vireo	<i>Vireo atricapilla</i>	LE	E	Rangelands with scattered clumps of shrubs separated by open grassland
Ellis, Johnson	Birds	Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	LE	E	Woodlands with tall Ashe juniper, oaks, other hardwood trees
Ellis, Johnson	Birds	Henslow's Sparrow	<i>Ammodramus henslowii</i>			Tall-grass prairies
Ellis, Johnson	Birds	Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E	Sand & gravel bars within a wide unobstructed river channel, or open flats along shorelines of lakes & reservoirs
Ellis, Johnson	Birds	Peregrine Falcon	<i>Falco peregrinus</i>	DL	T	High cliffs, often near water where prey species are most common
Ellis, Johnson	Birds	Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>			Open areas with mammal burrows; wide variety of arid & semi-arid environments, with well-drained, level to gently sloping areas characterized by sparse vegetation & bare ground
Ellis, Johnson	Birds	White-faced Ibis	<i>Plegadis chihi</i>		T	Marshes, swamps, ponds, rivers
Ellis, Johnson	Birds	Whooping Crane	<i>Grus americana</i>	LE	E	Dry prairie & flatwoods with saw palmetto, various grasses, scattered slash pine, & scattered strands of cypress
Ellis	Birds	Wood Stork	<i>Mycteria americana</i>		T	Shallow water habitat found in swamps, marshes, ponds
Johnson	Fishes	Sharp-nose shiner	<i>Notropis oxyrinchus</i>	C		Moderate current velocities & depths; usually in areas with sand substrate
Johnson	Fishes	Smalleye shiner	<i>Notropis buccula</i>	C		Common in river channels or periphery of channels in water with moderate depth & current velocities; substrate usually sand or silt; typically in turbid waters of broad, sandy channels of main stream, over substrate consisting mostly of

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
						shifting sand
<b>Johnson</b>	Mammals	Gray wolf	<i>Canis lupus</i>	LE	E	Forests, brushlands, or grasslands where suitable cover & denning sites are available
<b>Ellis, Johnson</b>	Mammals	Plains spotted skunk	<i>Spilogale putorius interrupta</i>			Shrublands, open wooded lots, along streams & prairies
<b>Ellis, Johnson</b>	Mammals	Red wolf	<i>Canis rufus</i>	LE	E	Brushy & forested areas, coastal prairie & marsh habitat
<b>Ellis</b>	Mollusks	Fawnsfoot	<i>Truncilla donaciformis</i>			Large rivers or lower reaches of medium-sized streams in sand or gravel
<b>Ellis</b>	Mollusks	Little spectaclecase	<i>Villosa lienosa</i>			Large, freshwater streams & rivers
<b>Ellis</b>	Mollusks	Louisiana pigtoe	<i>Pleurobema riddellii</i>			Small numbers of living specimens have been found in the Neches River, some of its tributaries, & the Angelina River
<b>Ellis, Johnson</b>	Mollusks	Pistolgrip	<i>Tritogonia verrucosa</i>			Freshwater streams & rivers, avoids shifting sand
<b>Ellis, Johnson</b>	Mollusks	Rock pocket-book	<i>Arcidens confragosus</i>			Medium-sized rivers & backwater pools
<b>Ellis</b>	Mollusks	Sandbank pocket-book	<i>Lampsilis satura</i>			Large, freshwater streams & rivers
<b>Johnson</b>	Mollusks	Texas fawnsfoot	<i>Truncilla macrodon</i>			Brazos River between Possum Kingdom & the mouth of the Navasota River represents the only known surviving population
<b>Ellis</b>	Mollusks	Texas heelsplitter	<i>Potamilus amphichaenus</i>			Large, freshwater streams & rivers; very rare
<b>Ellis</b>	Mollusks	Texas pigtoe	<i>Fusconaia askewi</i>			Freshwater rivers & streams
<b>Ellis</b>	Mollusks	Wabash pigtoe	<i>Fusconaia flava</i>			Prefers gravel substrates & moderate currents
<b>Ellis</b>	Reptiles	Alligator snapping turtle	<i>Macrochelys temminckii</i>		T	Trinity & Sabine river watersheds; close to large water bodies
<b>Johnson</b>	Reptiles	Brazos water snake	<i>Nerodia harteri</i>		T	Shallow riffles & rapids with rocky cover, dirt banks, rocky shorelines, woody vegetation near the river & adequate stream flows
<b>Ellis, Johnson</b>	Reptiles	Texas garter snake	<i>Thamnophis sirtalis annectens</i>			Dry, lightly wooded areas
<b>Ellis, Johnson</b>	Reptiles	Texas horned	<i>Phrynosoma cornutum</i>		T	Arid & semiarid habitats in open areas with sparse plant

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
		lizard				cover; loose sand or loamy soils
<b>Ellis, Johnson</b>	Reptiles	Timber/ Canebrake rattlesnake	<i>Crotalus horridus</i>		T	Moist lowland forests & hilly woodlands or thickets near permanent water sources where tree stumps, logs & branches provide refuge

LE, LT: Federally Listed Endangered/Threatened

PE, PT: Federally Proposed Endangered/Threatened

SAE, SAT: Federally Listed Endangered/Threatened by Similarity of Appearance

C: Federal Candidate for Listing, formerly Category 1 Candidate

DL, PDL: Federally Delisted/Proposed for Delisting

NL: Not Federally Listed

E, T: State Listed Endangered/Threatened

NT: Not tracked or no longer tracked by the State

"Blank:" Rare, but with no regulatory listing status



## Lavon Lavon Rail Corridor Pilot Area

### Location

The proposed Lake Lavon rail line is located in the Dallas-Fort Worth metropolitan area of North Central Texas. This line, as outlined in Mobility 2030, is planned to extend from downtown Garland to southeast Collin County with stops at Sachse and Wylie, and terminates at Lake Lavon. See Figure G.29 for a map of this corridor.

**Lake Lavon Rail Corridor: Location**



**Figure G.29:** Map of the Lake Lavon rail corridor as presented in Mobility 2030.<sup>1</sup>

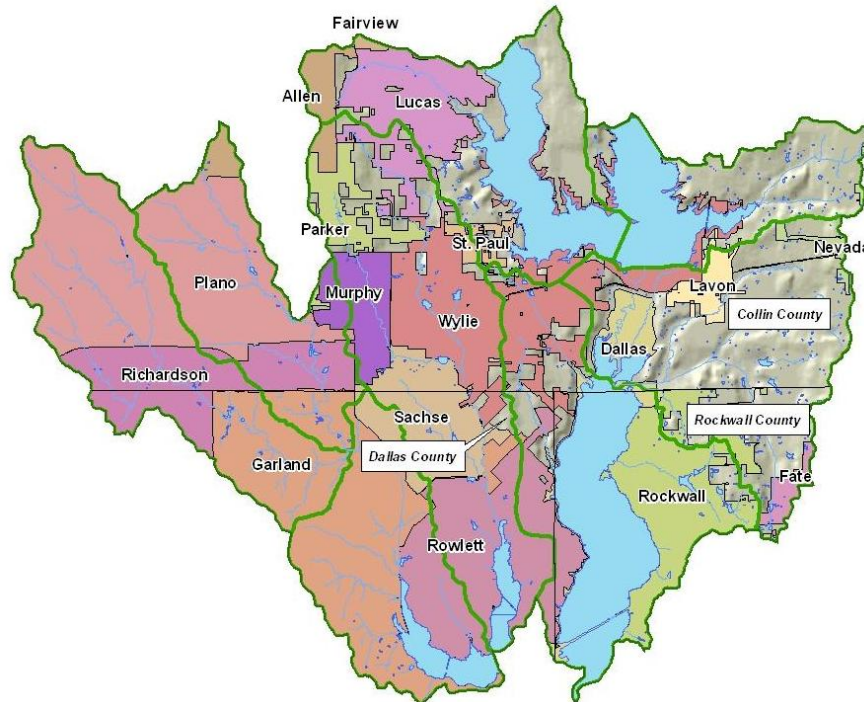
The proposed Lake Lavon rail corridor lies within eight subwatersheds, and include the White Rock Creek-Lavon Lake, Price Creek-Lavon Lake, Camp Creek-Lake Ray Hubbard, Cottonwood Creek East Fork Trinity River, Muddy Creek-Lake Ray Hubbard, Brown Brach Rowlett Creek, Pittman Creek-Spring Creek, and Rowlett Creek-Lake Ray Hubbard subwatersheds. See Figure G.30. The majority of this area is located in southern Collin County but also reaches into northeast Dallas County and northwest Rockwall County. Portions of the pilot area fall within the boundaries of the following cities: Allen, Dallas, Fairview, Fate, Garland, Lavon, Lucas, Murphy, Nevada, Parker, Plano, Richardson, Rockwall, Rowlett, Sachse, Saint Paul, and Wylie. See Figure G.31.

### Lake Lavon Rail Corridor Pilot Area: Subwatersheds



**Figure G.30:** The eight subwatersheds that make up the Lake Lavon Rail Corridor Pilot Area—White Rock Creek-Lavon Lake, Price Creek-Lavon Lake, Camp Creek-Lake Ray Hubbard, Cottonwood Creek East Fork Trinity River, Muddy Creek-Lake Ray Hubbard, Brown Brach Rowlett Creek, Pittman Creek-Spring Creek, and Rowlett Creek-Lake Ray Hubbard subwatersheds.

### Lake Lavon Rail Corridor Pilot Area: Communities

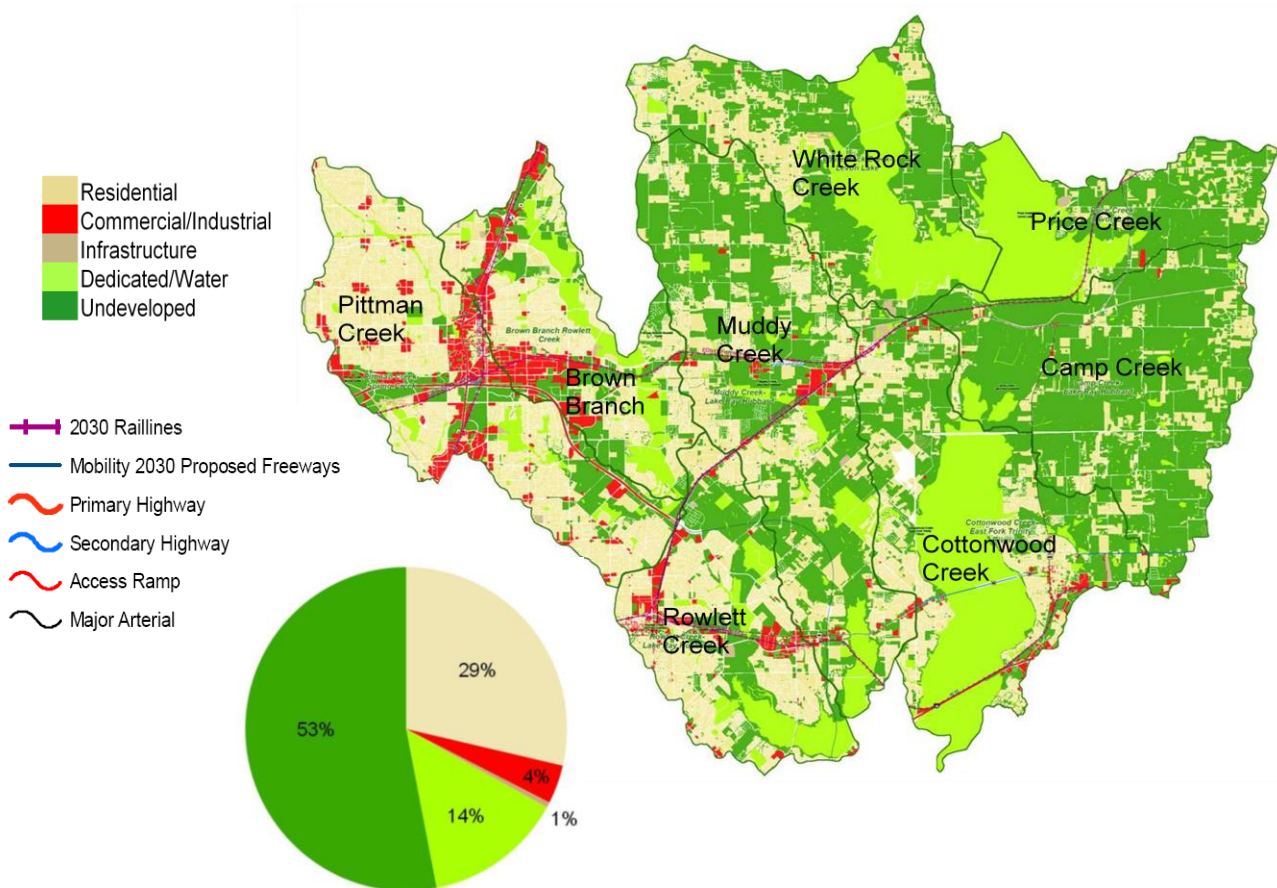


**Figure G.31:** The communities within the Lake Lavon Rail Corridor Pilot Area—Allen, Dallas, Fairview, Fate, Garland, Lavon, Lucas, Murphy, Nevada, Parker, Plano, Richardson, Rockwall, Rowlett, Sachse, Saint Paul, Wylie, Dallas County, Rockwall County, and Collin County.

## Land Use

The dominating land use in the Lake Lavon pilot area is undeveloped (53 percent), followed by residential (29 percent), dedicated water (14 percent), commercial/industrial (four percent), and finally, infrastructure (one percent). See Figure G.32. Generally, the west side of the pilot area, which is closer to the urban core of the Dallas-Fort Worth metroplex, consists predominately of residential and commercial/industrial areas while the east side is more undeveloped and contains more dedicated/water features.

**Lake Lavon Rail Corridor: 2005 Land Use by Category**



**Figure G.32:** 2005 land use by category (residential, commercial/industrial, infrastructure, dedicated/water, and undeveloped) in the Lake Lavon Rail Corridor Pilot Area. The pie chart breaks down the total amount of land use in the five subwatersheds by category.

### Undeveloped

This category consists of areas that are vacant, under construction, or parking lots/garages. Most of the undeveloped land in this pilot area is located in the Camp Creek (86 percent), Muddy Creek (67 percent), and White Rock Creek (63 percent) subwatersheds. The Rowlett Creek subwatershed contains the least at 31 percent.

### Residential

This category consists of areas serving as single family housing, multi-family housing, mobile homes, group quarters, and institutional facilities. Residential areas in the Pittman Creek (43 percent) and Rowlett Creek (42 percent) subwatersheds are the most common land use type in these subwatersheds. The White Rock Creek, Muddy Creek, Cottonwood Creek, and Brown Branch subwatersheds are all made up

of about 20 to 27 percent residential areas. The Price Creek subwatershed contains the least at 14 percent.

#### Dedicated/water

This category consists of parks, recreational areas, landfills, flood control areas, or surface water. Lake Lavon and Lake Ray Hubbard are two major water supply reservoirs in the North Central Texas region and are partially located in the Lake Lavon pilot area. Portions of these lakes reach into six of the eight subwatersheds. Almost 40 percent of the Price Creek subwatershed is comprised of dedicated/water features, with the majority consisting of the southeast part of Lake Lavon. The two subwatersheds—Brown Branch and Pittman Creek—without portions of Lake Lavon or Lake Ray Hubbard contain tributaries to Lake Ray Hubbard. A major trail system, known as Trinity Trails, winds its way along the east side of Lake Lavon in the White Rock Creek subwatershed. Park areas appear to be common in these subwatersheds, for instance, the Camp Creek subwatershed contains the least amount of dedicated/water features (one percent), which appears to be comprised of the north tip of Lake Ray Hubbard.



**East Fork Park at Lake Lavon in the White Rock Creek subwatershed**

#### Commercial/Industrial

This category consists of office, retail, hotel/motel, large stadium, and industrial sites. Commercial/industrial sites are most common in the Brown Branch (10 percent), Pittman Creek (9 percent), and Rowlett Creek (7 percent) subwatersheds of the Lake Lavon pilot area. The large cluster at the Brown Branch and Pittman Creek subwatershed boundaries are in the Richardson/Plano area and appears to be a more commercially-oriented location with some industrial-type places mixed in, such as Texas Instruments. The remaining five subwatersheds are made up of almost zero percent to just over two percent in commercial/industrial sites. The White Rock and Camp Creek subwatersheds contain the least at 0.21 and 0.26 percent, respectively.



**Major Industrial Site at Lake Lavon**

#### Infrastructure

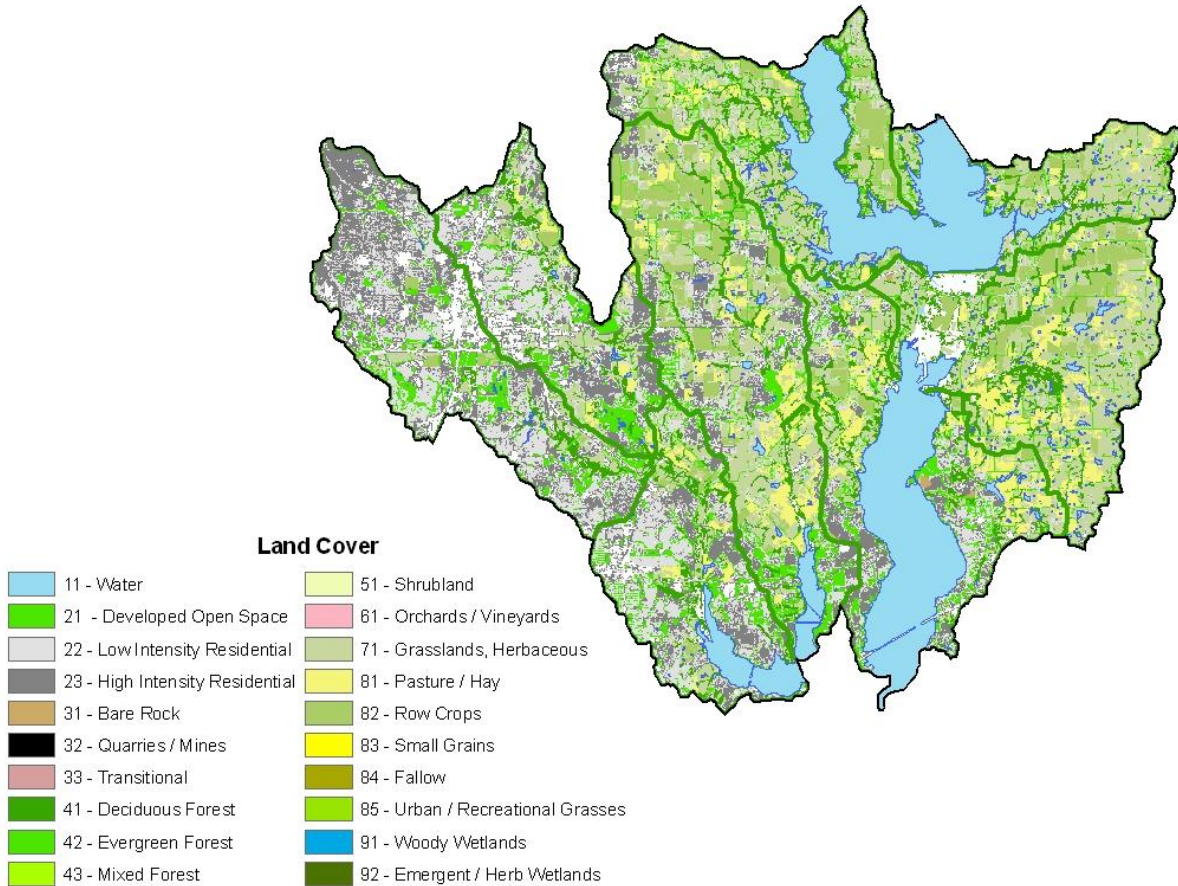
This category consists of transportation, roadways, utilities, airports, and runways. Infrastructure (0.55 percent) is the least common land use category in this pilot area. The percentages range from 0.30 (Camp Creek subwatershed) to 0.69 (Brown Branch subwatershed) percent. Major roadways located in the Lake Lavon pilot area include Highway 75 and 190, State Highway 78, and Interstate 30. The more developed subwatersheds appear to contain more highway miles. There is a small municipal airport in Rockwall, located on the east side of Lake Ray Hubbard in the Cottonwood Creek subwatershed,

#### Land Cover

The land cover types that define the Lake Lavon pilot area are depicted in Figure G.33. This data layer helps describe the land use categories previously discussed. The majority of land in the Lake Lavon pilot

area is “undeveloped,” and this undeveloped land appears to be mostly characterized by surface water (see the “water resources” section below for more information), grasslands/herbaceous, and agricultural-related land cover classifications. There are also some forested areas. Residential land use is a common category in the Lake Lavon pilot areas and consists of a mix of low and high intensity residential areas. The high intensity residential areas appear to be mostly clustered at the north part of the Pittman Creek subwatershed in the Plano area.

**Lake Lavon Rail Corridor Pilot Area: Land Cover**



**Figure G.33:** Land cover, identified in the legend by code and type, in the SH 360 Corridor Pilot Area as defined by the U.S. Geological Survey’s (USGS) 2001 National Land Cover Database (NLCD).

**Grasslands**

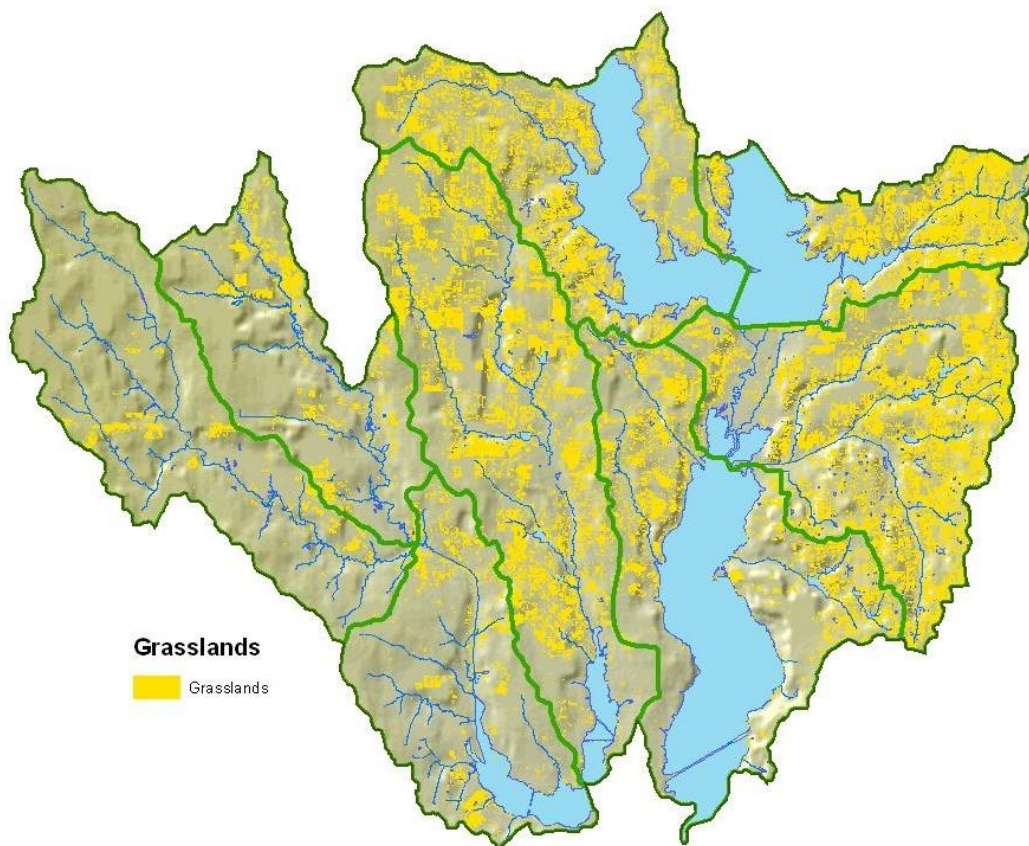
The areas shaded yellow in Figure G.34 represent the NLCD’s classification scheme 71, grasslands/herbaceous. Shorter varieties of grasslands are native to this pilot area’s landscape and provide critical habitat to a variety of species.<sup>3</sup> This data may not differentiate between natural grassland and mowed grassland. As discussed, most of the developed land exists in the western part of the Lake Lavon pilot area, which contains fewer grassland areas than the less developed areas to the east. The clusters that are visible in the Pittman Creek and Brown Branch subwatersheds in Figure G.34 appear to be park areas, such as the Spring Creek Park Preserve in Garland. The five subwatersheds that are predominately



**Grassland Area at the Spring Creek Park Preserve in Garland**

undeveloped to the east seem to have a mix of grasslands and agricultural-related land covers.

### Lake Lavon Rail Corridor Pilot Area: Grasslands

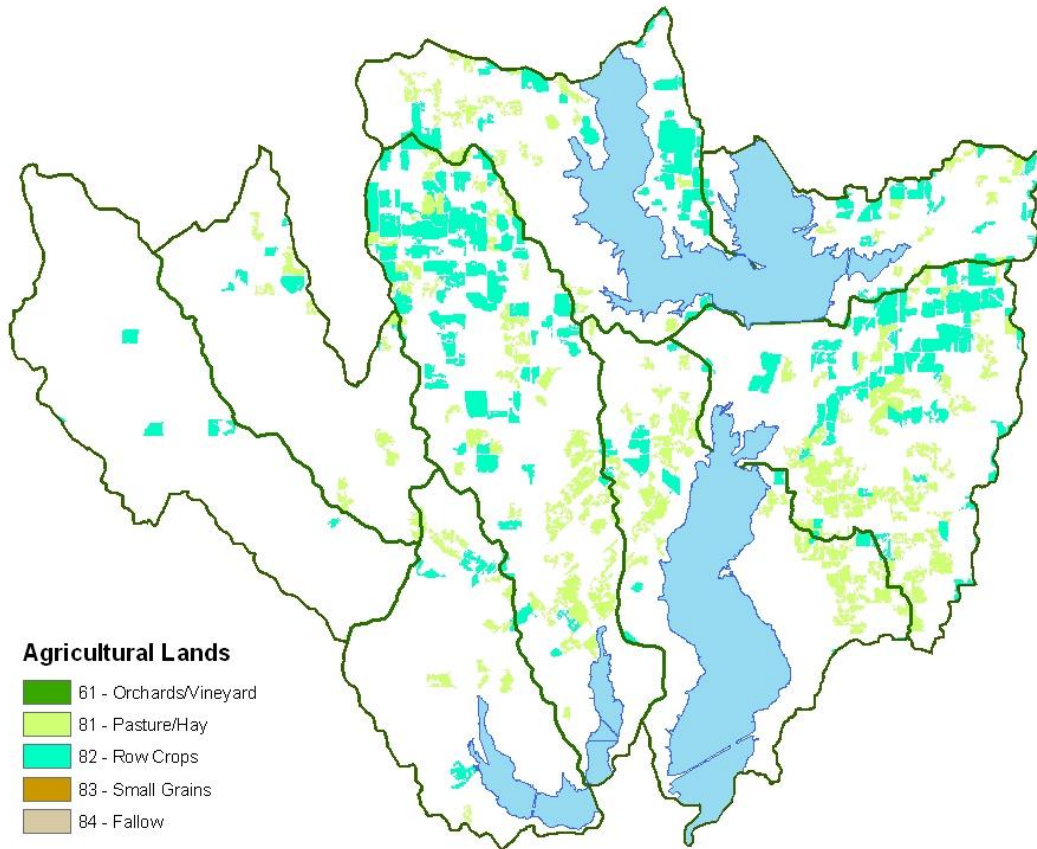


**Figure G.34:** Grasslands/herbaceous in the Lake Lavon Rail Corridor Pilot Area represented by classification scheme 71 from USGS's 2001 NLCD.

#### Agricultural lands

The areas shaded tan, orange, and various tones of green in Figure G.35 represent agricultural-related land cover classifications schemes. There appears to be an even mix of pasture/hay and row crops present in the Lake Lavon pilot area. Generally, the pasture/hay areas are more common in the southern part of the pilot area while the row crops are more common in the northern part. Soil types may be one of many possible reasons for this. The Muddy Creek and Camp Creek subwatersheds appear to have more agricultural lands than the other subwatersheds. Like the grasslands, the western part of the Lake Lavon pilot area contains fewer agricultural lands than the less developed areas to the east. The pasture/hay areas may be dedicated to the production of hay or may be inhabited by livestock. The other agricultural lands are for the production of food for humans and or animal feed. There are not any lands dedicated to orchards/vineyards, small grains, or fallow. It is possible that many small grains may also be considered row crops.

### Lake Lavon Rail Corridor Pilot Area: Agricultural Lands



**Figure G.35:** Agricultural lands in the Lake Lavon Rail Corridor Pilot Area represented by classification schemes 61, 81, 82, 83, and 84 from USGS's 2001 NLCD.

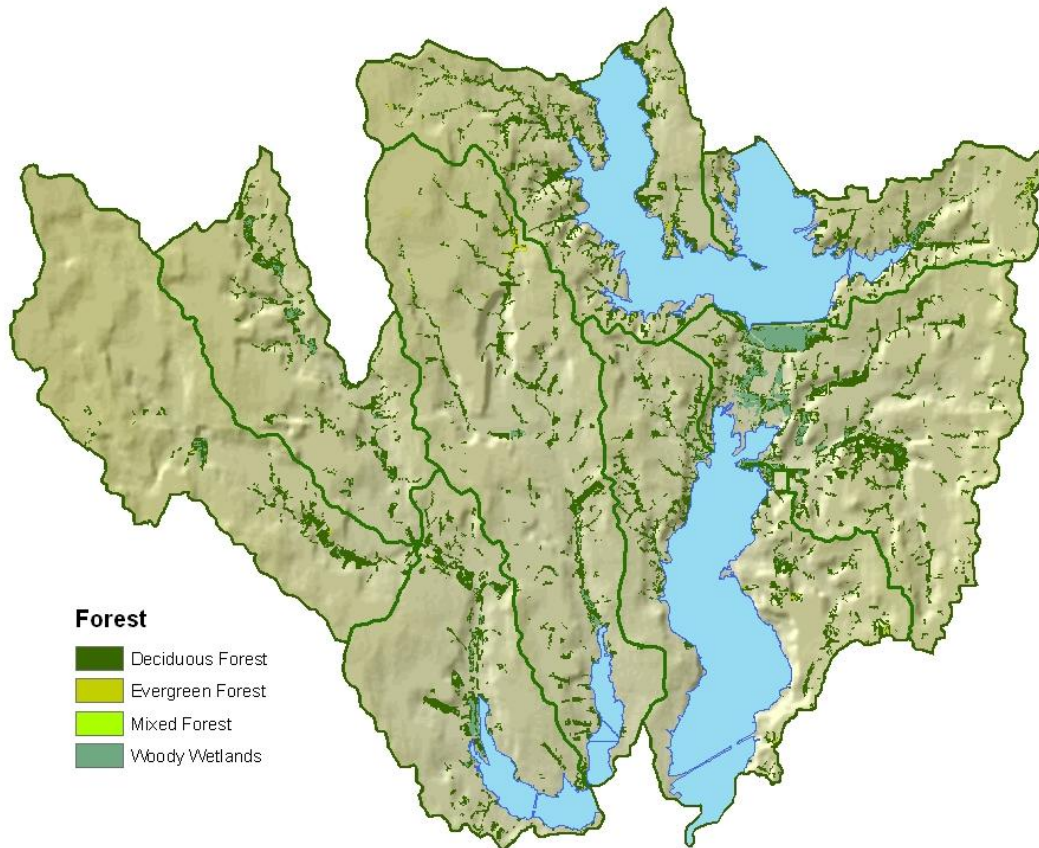
#### Forested areas

The forested areas in the Lake Lavon pilot area are characterized by deciduous forest, evergreen forest, and woody wetlands. There do not appear to be any areas designated as mixed forest. See Figure G.36. The deciduous forest land cover is the most common forest type, with some evergreen forest mixed in. Most of the woody wetlands are just south of Lake Lavon and just north of Lake Ray Hubbard; however, there are several smaller areas in the Muddy Creek and Rowlett Creek subwatersheds. Several of the forested areas appear to follow stream lines. This is particularly apparent in the Rowlett Creek, Pittman Creek, and Brown Branch Creek subwatersheds. The large forested cluster in the Pittman Creek subwatershed is Spring Creek at the Spring Creek Park Preserve.



**Forested Area Surrounding Spring Creek**

### Lake Lavon Rail Corridor Pilot Area: Forested Areas



**Figure G.36:** Forested areas in the Lake Lavon Rail Corridor Pilot Area represented by classification schemes 41, 42, 43, and 91 from USGS's 2001 NLCD.

#### *Water Resources*

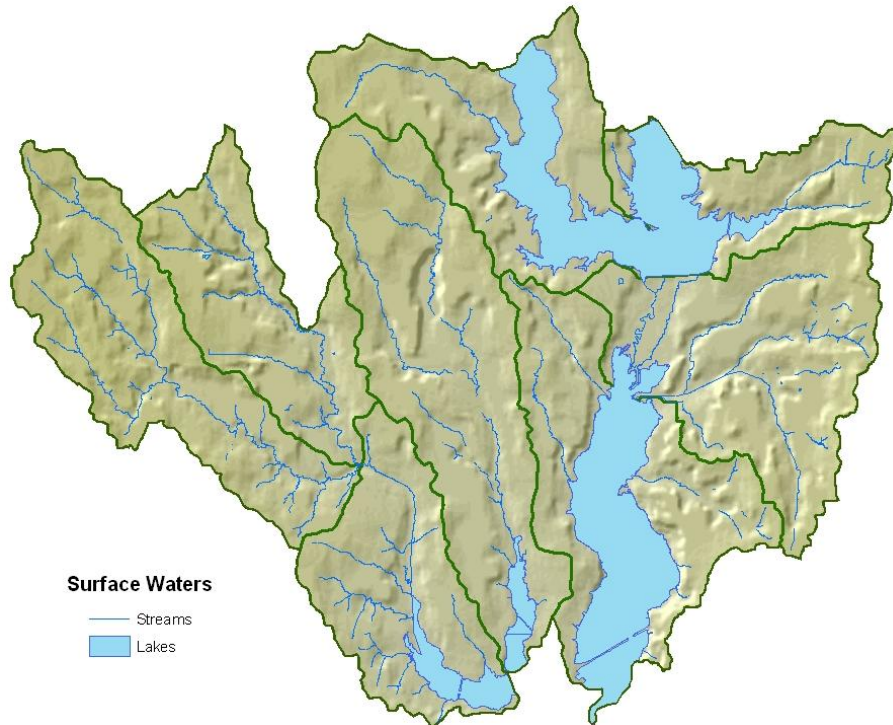
As discussed in the dedicated/water portion of the land use section, portions of two major water supply lake in the North Central Texas region, Lake Lavon and Lake Ray Hubbard, are within the Lake Lavon pilot area. There are also several streams and wetlands present. See Figure G.37 and 38. The streams in the White Rock Creek and Price Creek subwatersheds drain to Lake Lavon, while the streams in the Pittman Creek, Brown Branch Creek, Camp Creek, Rowlett Creek, and Cottonwood Creek subwatersheds drain to Lake Ray Hubbard. The wetlands in the pilot area are found in the Camp Creek, Muddy Creek, and Rowlett Creek subwatersheds. Several threats to the pilot area's water resources exist and communities and organizations have been working to protect those resources.



**View of Lake Lavon from Boat Ramp at East Fork Park in Wylie**

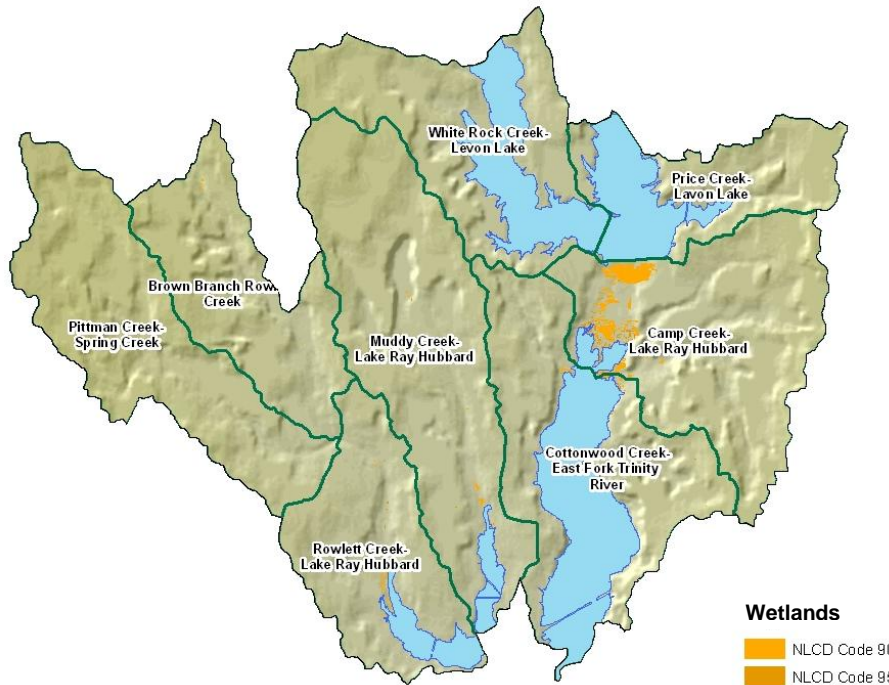


### Lake Lavon Rail Corridor Pilot Area: Surface Water



**Figure G.37:** Surface water in the Lake Lavon Rail Corridor Pilot Area (USGS, National Hydrological Dataset).

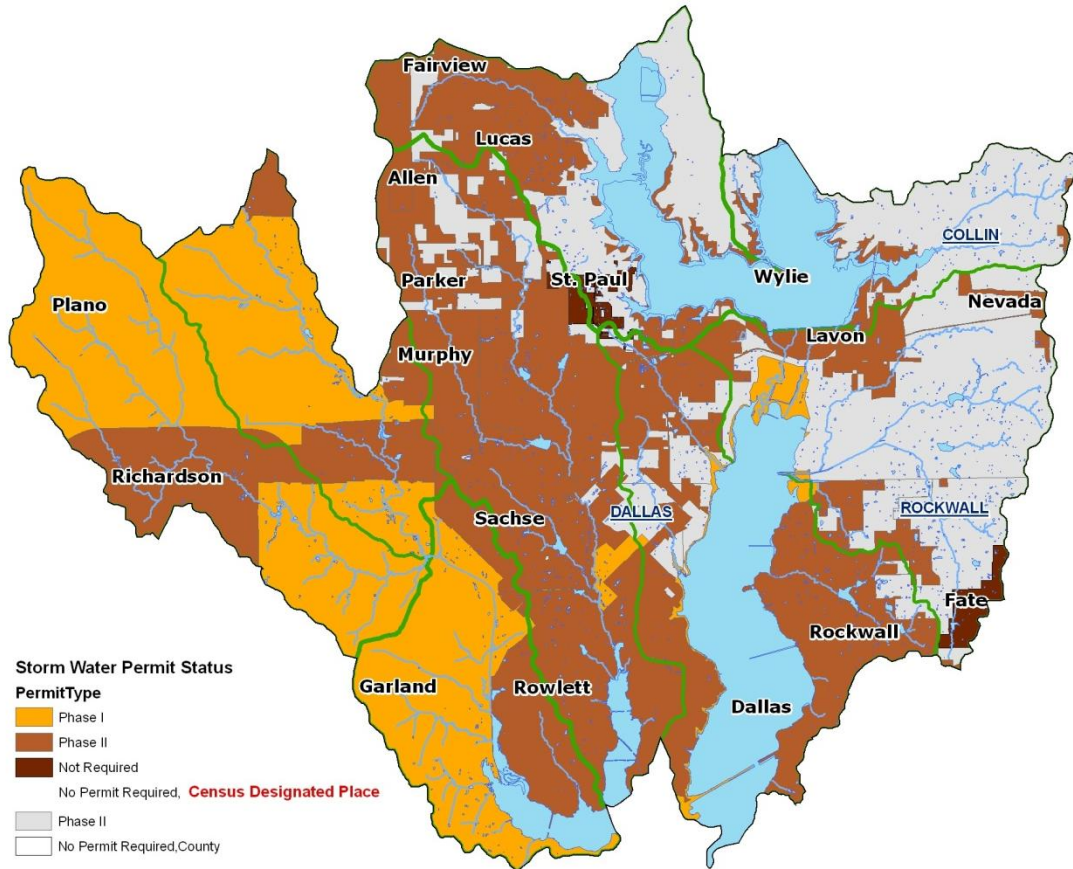
### Lake Lavon Rail Corridor Pilot Area: Wetlands



**Figure G.38:** Wetlands in the Lake Lavon Rail Corridor Pilot Area represented by classification scheme 90 (woody wetlands) and 95 (emergent herbaceous wetlands) from USGS's NLCD.

Muddy Creek within the Muddy Creek subwatershed has been impaired for bacteria since 2002, but according to TCEQ's 2010 303(d) draft, has been delisted. Lake Lavon was listed from 2000 to 2002 as impaired for atrazine, and from 2002 and 2004 was included in TCEQ's 305(b) list of concerns for depressed dissolved oxygen and levels of nitrate + nitrite nitrogen in certain parts of the lake.<sup>2</sup> Some of the many efforts to protect water quality in the pilot area include atrazine remediation in the Lake Lavon watershed by the Texas State Soil and Water Conservation Board and the Collin County Soil and Water Conservation Board<sup>7</sup> and ongoing storm water management to reduce the discharge of pollutants from municipal separate storm sewer systems (MS4s). Eighteen of the twenty communities, defined as Phase I or Phase II MS4s, are required to develop and implement storm water management programs. See Figure G.39.

Lake Lavon Rail Corridor Pilot Area: MS4s



**Figure G.39:** Storm water permit status for communities within the Lake Lavon Rail Corridor Pilot Area. A permit is required for the following communities: City of Dallas, City of Garland, City of Plano, City of Allen, Town of Fairview, City of Lavon, City of Lucas, City of Murphy, City of Nevada, City of Parker, City of Richardson, City of Rockwall, City of Rowlett, City of Sachse, City of Wylie, Collin County, Dallas County, and Rockwall County. A permit is not required for the following communities: City of Fate and Town of Saint Paul.

Another threat to the pilot area's water resources are the potential spread of invasive zebra mussels from Lake Texoma into the head waters of Lake Lavon. While no issues associated with zebra mussels have been reported, zebra mussels can have a significant impact on recreational opportunities, wildlife, and water treatment. For instance, zebra mussels can block water treatment plant intakes and pipes; can cause declines in fish populations, native mussels, and birds; and can also restrict water flow in pipes, foul swimming beaches, damage boat engine cooling systems, and cause navigation buoys to sink.<sup>8</sup> Texas Parks and Wildlife Department (TPWD) are developing a plan to deal with this threat and are working to ensure boaters and anglers do not spread zebra mussels.

### Ecological Characteristics

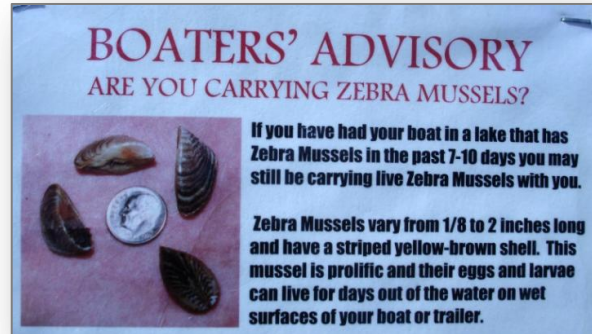
The ecological characteristics of the Lake Lavon pilot area described in this section include a discussion of the ecoregion, ecologically important areas, and rare, threatened or endangered species present.

#### Ecoregion

The Lake Lavon pilot area is part of the Texas Blackland Prairies ecoregion, as defined by Omernik which are based on phenomena including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The Texas Blackland Prairies form a disjunct ecological region, distinguished from surrounding regions by fine-textured, clayey soils and predominantly prairie potential natural vegetation. The predominance of Vertisols in this area is related to soil formation in Cretaceous shale, chalk, and marl parent materials. Unlike tallgrass prairie soils that are mostly Mollisols in states to the north, this region contains Vertisols, Alfisols, and Mollisols. Dominant grasses included little bluestem, big bluestem, yellow Indiangrass, and switchgrass. This region now contains a higher percentage of cropland than adjacent regions; pasture and forage production for livestock is common. Large areas of the region are being converted to urban and industrial uses. Typical game species include mourning dove and northern bobwhite on uplands and eastern fox squirrel along stream bottomlands.<sup>3</sup>

#### Ecologically important areas

According to the U.S. Environmental Protection Agency's (EPA) Texas Ecological Assessment Protocol (TEAP) composite map for the Lake Lavon pilot area, the more ecologically important areas, as depicted by the darker shades in Figure G.40, are clustered around Lake Ray Hubbard. There is also an area identified just south of Lake Lavon and in the north part of the Rowlett Creek subwatershed. The red areas with a score of five, which are not present in the composite map of the Lake Lavon pilot area, represent the top one percent highly ecologically important areas in Texas. This composite map is based on three ecological criteria—rarity, sustainability, and diversity.<sup>4</sup> TEAP data are calculated according to Bailey's ecoregions and do not match up to the subwatershed boundaries. These layers are mapped in Figure G.41, G.42, and G.43. The more rare areas are clustered just west of Lake Lavon in the Lucas and unincorporated areas of Collin County. The more diverse and sustainable areas are generally found around Lake Lavon and Lake Ray Hubbard.



Sign Posted at a Lake Lavon Boat Ramp

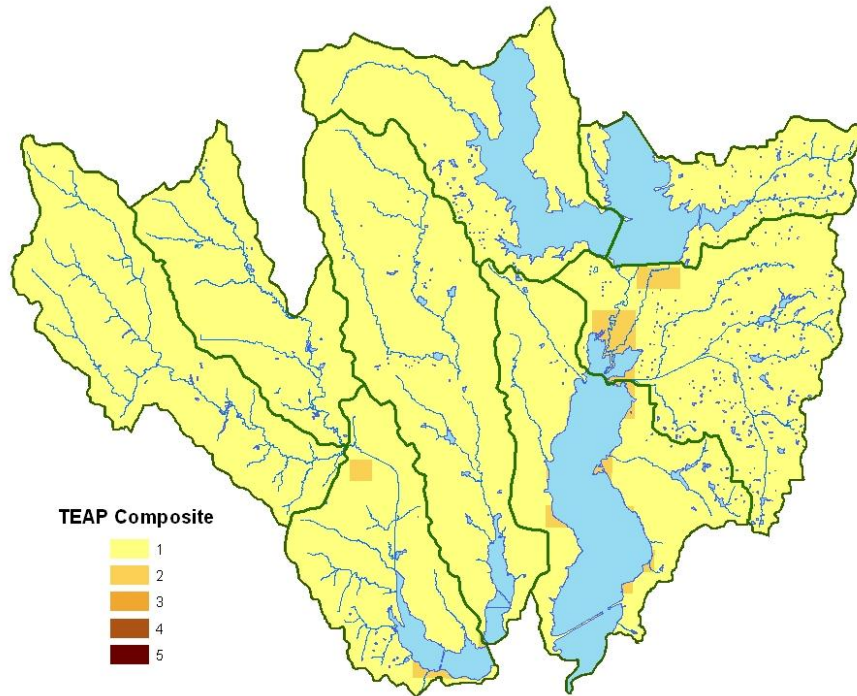


Tree Full of Red Cardinals at Spring Creek Park Preserve in Garland



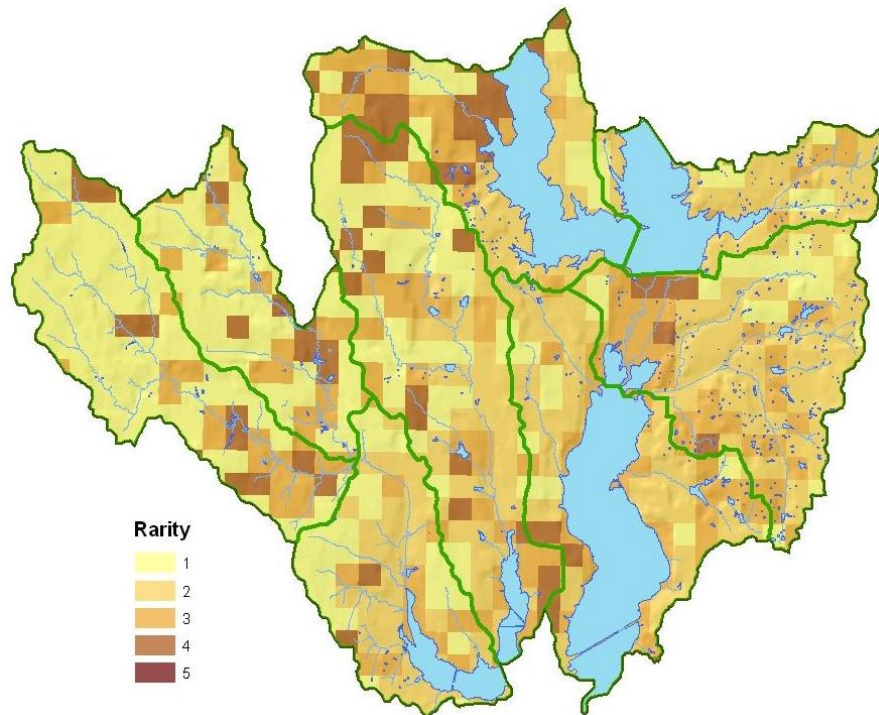
Red Cardinal

### Lake Lavon Rail Corridor Pilot Area: TEAP



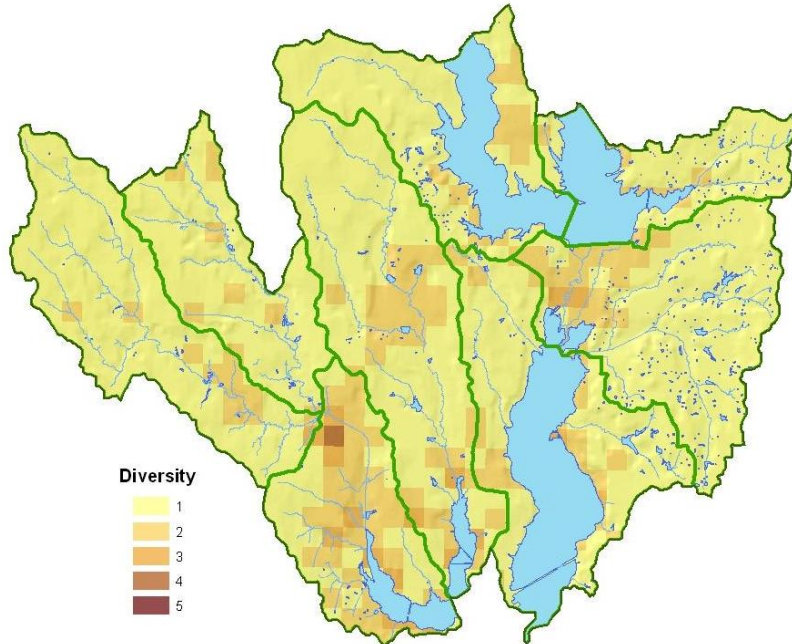
**Figure G.40:** Ecologically important areas in the Lake Lavon Rail Corridor Pilot Area. The TEAP composite is based on three ecological criteria—rarity, sustainability, and diversity.<sup>4</sup> The darker areas are more ecologically important.

### Lake Lavon Rail Corridor Pilot Area: REAP Rarity



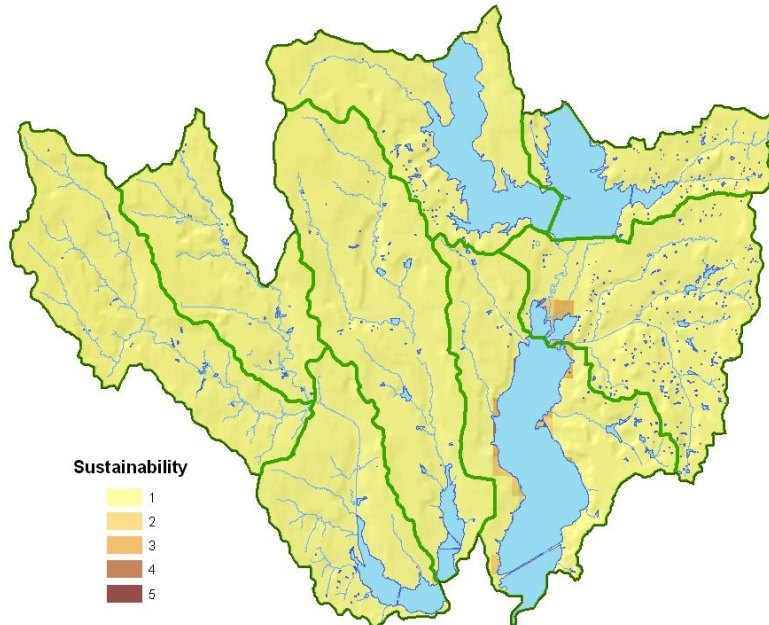
**Figure G.41:** REAP rarity in the Lake Lavon Rail Corridor Pilot Area. This layer consists of four sub-layers: (1) vegetation rarity, (2) natural heritage rank, (3) taxonomic richness, and (4) rare species richness.<sup>4</sup> The darker shaded areas are higher in rarity.

### Lake Lavon Rail Corridor Pilot Area: REAP Diversity



**Figure G.42:** REAP diversity in the Lake Lavon Rail Corridor Pilot Area. This layer consists of four sub-layers: (1) appropriateness of land cover, (2) contiguous size of undeveloped area, (3) Shannon land cover diversity, and (4) ecologically significant stream segments.<sup>4</sup> The darker shaded areas are higher in diversity.

### Lake Lavon Rail Corridor Pilot Area: REAP Sustainability



**Figure G.43:** REAP sustainability in the Lake Lavon Rail Corridor Pilot Areas. This layer consists of eleven measures that can be loosely grouped into fragmentors: (1) contiguous land cover type, (2) regularity of ecosystem boundary, (3) appropriateness of land cover, (4) waterway obstruction, and (5) road density and stressors: (1) airport noise, (2) Superfund National Priority List (NPL) and state Superfund Sites, (3) water quality, (4) air quality, (5) Resource Conservation and Recovery Act (RCRA) Treatment-Storage-Disposal sites (TSD), corrective action and state Voluntary Cleanup Program (VCP) Sites, and (6) urban/agricultural disturbance.<sup>4</sup> The darker shaded areas are higher in diversity.

Rare, threatened, or endangered species

TPWD's database of rare, threatened, or endangered species of Texas are identified by county.<sup>5</sup> The Lake Lavon pilot area is located in northeast Johnson County and northwest Ellis County. The rare, threatened, or endangered species that may be present in this pilot area are identified in Table G.3. The types of habitat that these species may be found in are also listed.<sup>6</sup>

**Table G.3:** Rare, threatened, or endangered species that may be present the Lake Lavon Rail Corridor Pilot Area, and their habitat type.

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
Collin, Dallas, Rockwall	Birds	American Peregrine Falcon	<i>Falco peregrine anatum</i>	DL	T	Meadows, mudflats, beaches, marshes, lakes
Collin, Dallas, Rockwall	Birds	Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL		Meadows, mudflats, beaches, marshes, lakes
Collin, Dallas, Rockwall	Birds	Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T	Quiet coastal areas, rivers or lakeshores with large, tall trees
Dallas	Birds	Black-capped Vireo	<i>Vireo atricapilla</i>	LE	E	Rangelands with scattered clumps of shrubs separated by open grassland
Dallas	Birds	Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	LE	E	Woodlands with tall Ashe juniper, oaks, other hardwood trees
Collin, Dallas, Rockwall	Birds	Henslow's Sparrow	<i>Ammodramus henslowii</i>			Tall-grass prairies
Collin, Dallas	Birds	Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E	Sand & gravel bars within a wide unobstructed river channel, or open flats along shorelines of lakes & reservoirs
Collin, Dallas, Rockwall	Birds	Peregrine Falcon	<i>Falco peregrinus</i>	DL	T	High cliffs, often near water where prey species are most common
Collin, Dallas, Rockwall	Birds	Piping Plover	<i>Charadrius melodus</i>	LT	T	Beaches, sand, & gravel shores of large lakes
Collin, Dallas, Rockwall	Birds	Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>			Open areas with mammal burrows; wide variety of arid & semi-arid environments, with well-drained, level to gently sloping areas characterized by sparse vegetation & bare ground
Collin, Dallas, Rockwall	Birds	White-faced Ibis	<i>Plegadis chihi</i>		T	Marshes, swamps, ponds, rivers

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
Collin, Dallas, Rockwall	Birds	Whooping Crane	<i>Grus americana</i>	LE	E	Dry prairie & flatwoods with saw palmetto, various grasses, scattered slash pine, & scattered strands of cypress
Collin, Dallas, Rockwall	Birds	Wood Stork	<i>Mycteria americana</i>		T	Shallow water habitat found in swamps, marshes, ponds
Collin	Crustaceans	A crayfish	<i>Procambarus steigmani</i>			Ditches, lakes, & streams
Dallas	Insects	Black Lordithon-rove beetle	<i>Lordithon niger</i>			Old growth northern hardwood or mixed coniferous forest below 2500 feet elevation
Dallas	Mammals	Cave myotis bat	<i>Myotis velifer</i>			Areas dominated by creosote bush, palo verde, brittlebush, and cactus
Collin, Dallas, Rockwall	Mammals	Plains spotted skunk	<i>Spilogale putorius interrupta</i>			Shrublands, open wooded lots, along streams & prairies
Collin, Rockwall	Mammals	Red wolf	<i>Canis rufus</i>	LE	E	Brushy & forested areas, coastal prairie & marsh habitat
Collin, Dallas, Rockwall	Mollusks	Fawnsfoot	<i>Truncilla donaciformis</i>			Large rivers or lower reaches of medium-sized streams in sand or gravel
Collin, Rockwall	Mollusks	Little spectaclecase	<i>Villosa lienosa</i>			Large, freshwater streams & rivers
Collin, Dallas, Rockwall	Mollusks	Louisiana pigtoe	<i>Pleurobema riddellii</i>			Small numbers of living specimens have been found in the Neches River and some of its tributaries and the Angelina River
Collin, Dallas, Rockwall	Mollusks	Pistolgrip	<i>Tritogonia verrucosa</i>			Freshwater streams & rivers, avoids shifting sand
Collin, Dallas, Rockwall	Mollusks	Rock pocket-book	<i>Arcidens confragosus</i>			Medium-sized rivers & backwater pools
Collin, Dallas, Rockwall	Mollusks	Sandbank pocket-book	<i>Lampsilis satura</i>			Large, freshwater streams & rivers
Collin, Dallas, Rockwall	Mollusks	Texas heelsplitter	<i>Potamilus amphichaenus</i>			Large, freshwater streams & rivers; very rare
Collin, Dallas, Rockwall	Mollusks	Wabash pigtoe	<i>Fusconaia flava</i>			Prefers gravel substrates & moderate currents
Dallas	Plants	Glen Rose	<i>Yucca</i>			Sandy soils of the

County	Taxon	Common Name	Scientific Name	Federal Status	State Status	Habitat
		yucca	<i>necopina</i>			Western Cross Timbers
Dallas	Plants	Warnock's coral-root	<i>Hexalectris warnockii</i>			Oak-juniper woodlands on shaded slopes & intermittent, rocky creekbeds in canyons
Collin, Dallas, Rockwall	Reptiles	Alligator snapping turtle	<i>Macrochelys temminckii</i>		T	Trinity & Sabine river watersheds; close to large water bodies
Collin, Dallas, Rockwall	Reptiles	Texas garter snake	<i>Thamnophis sirtalis annectens</i>			Dry, lightly wooded areas
Collin, Dallas, Rockwall	Reptiles	Texas horned lizard	<i>Phrynosoma cornutum</i>		T	Arid & semiarid habitats in open areas with sparse plant cover; loose sand or loamy soils
Collin, Dallas, Rockwall	Reptiles	Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>		T	Moist lowland forests & hilly woodlands or thickets near permanent water sources where tree stumps, logs & branches provide refuge

LE, LT: Federally Listed Endangered/Threatened

PE, PT: Federally Proposed Endangered/Threatened

SAE, SAT: Federally Listed Endangered/Threatened by Similarity of Appearance

C: Federal Candidate for Listing, formerly Category 1 Candidate

DL, PDL: Federally Delisted/Proposed for Delisting

NL: Not Federally Listed

E, T: State Listed Endangered/Threatened

NT: Not tracked or no longer tracked by the State

"Blank:" Rare, but with no regulatory listing status



## References

- <sup>1</sup>North Central Texas Council of Governments. "Mobility 2030: The Metropolitan Transportation Plan for the Dallas-Fort Worth Area, 2009 Amendment." 2009, <http://www.nctcog.org/trans/mtp/2030/2009Amendment.asp>.
- <sup>2</sup>Texas Commission on Environmental Quality. "Water Quality Inventory and 303(d) List." 2008, <http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data>.
- <sup>3</sup>U.S. Environmental Protection Agency. "Ecoregions of Texas." 2007, [http://www.epa.gov/wed/pages/ecoregions/tx\\_eco.htm](http://www.epa.gov/wed/pages/ecoregions/tx_eco.htm).
- <sup>4</sup>U.S. Environmental Protection Agency Region 6, et al. "Texas Ecological Assessment Protocol (TEAP) Report." 2005, <http://www.epa.gov/region6/6en/xp/enxp2a4.htm>.
- <sup>5</sup>Texas Parks and Wildlife Department. Rare, Threatened, and Endangered Species of Texas by County Database. 2009, [http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered\\_species](http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species).
- <sup>6</sup>Texas Parks and Wildlife Department. Wildlife Fact Sheets. 2009, <http://www.tpwd.state.tx.us/huntwild/wild/species>.
- <sup>7</sup>Texas State Soil and Water Conservation Board and Collin County Soil and Water Conservation Board. "Atrazine Remediation in the Lake Lavon Watershed of Collin County, Texas." <http://www.tsswcb.state.tx.us/en/managementprogram/browsecompleted/All+Completed+Projects>.
- <sup>8</sup>Texas Parks and Wildlife Department. "Zebra Mussels Spreading in Texas." 2009, <http://www.tpwd.state.tx.us/newsmedia/releases/?req=20090817a>.