



A CONSERVATION BLUEPRINT  
FOR THE  
CROSSTIMBERS & SOUTHERN TALLGRASS PRAIRIE ECOREGION

January 2009

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Cover images (from left to right): The Nature Conservancy's Clymer Meadow Preserve in Texas, photographed by Rainie Bishop; Middle Blue River in Oklahoma, photographed by Jona Tucker; Keystone Ancient Forest Preserve in Oklahoma, photographed by Jay Pruett

## Acknowledgments

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“If future generations are to remember us more with gratitude than sorrow, we must achieve more than just the miracles of technology. We must also leave them a glimpse of the world as it was created, not just as it looked when we got through with it.”—Lyndon B. Johnson

## Ecoregional Overview

The Crosstimbers and Southern Tallgrass Prairie Ecoregion (CSTP) encompasses more than 49 million acres (76,750 square miles) and includes portions of four states—primarily Oklahoma and Texas, but also small areas in Arkansas and Kansas.

From north to south, this ecoregion touches the Flint Hills of southern Kansas, occupies much of central Oklahoma and Texas, and terminates at the northeastern edge of Tamaulipan Thornscrub. Nine ecoregions border CSTP (Figure 1).

The vast majority of the ecoregion is under private ownership (97%); 1.8% is federally owned, 1% is state owned, and the remainder is owned by local governments.

Figure 1. Location of the Crosstimbers and Southern Tallgrass Prairie Ecoregion



### PHYSIOGRAPHY

The topography of the ecoregion is generally level to rolling, with prominent sandstone ridges in the central portion of Oklahoma and some areas within the northwest portion in Texas. The limestone and granitic geology of the Arbuckle Uplift in south central Oklahoma presents additional relief. Elevation ranges from 150 feet above sea level in the ecoregion's southern extreme to about 1,100 feet on its northern and western boundaries.

Physiographic regions within Oklahoma include—from east to west—the Arbuckle Plains, Arbuckle Hills, Central Redbed Plains, Eastern Sandstone Cuesta Plains, Claremore Cuesta Plains, and Mangum Gypsum Hills (Curtis and Ham 1972). In Texas, physiographic regions include—from east to west—the Gulf Coastal Plains, Blackland Belt, Comanche Plateau, Palo Pinto Country, and in part, the Lampasas Cut Plain and Osage Plains (Stephens and Holmes 1989).

### CLIMATE

The grasslands of North America were formed by climate changes originating during the Miocene-Pliocene transition (Axelrod 1985). Their current distribution and attributes are determined primarily by regional temperature and precipitation gradients (Lauenroth 1979, Sala et al. 1988), with fire-grazing interactions also playing important roles in these grassland systems (Risser et al. 1981).

Hot continental summer temperatures and cool winters (accentuated by arctic blasts) are the norm in this ecoregion. Droughts are frequent, broken by severe weather featuring intense thunderstorms,



Top photo:  
Blue River in Oklahoma  
© Jona Tucker

Middle photo:  
Deciduous forest in the fall, Keystone  
Ancient Forest Preserve, Oklahoma  
© Jay Pruett

Bottom photo:  
Bison grazing at Clymer Meadow  
Preserve, Texas  
© Lynn McBride

## Ecoregional Overview

high winds, and tornadoes. Annual rainfall ranges from over 40 inches in the east to less than 30 inches in the west. In Oklahoma City, the average maximum temperature is 71° F and the average low is 49° F. The northern portion of the ecoregion has an average of 76 days of below freezing temperatures. In the southern portion of the ecoregion, the average maximum temperature is 80° F and the average minimum is 58° F. On average, the temperature falls below freezing only 22 days per year (based on climate records from San Antonio, Texas).

### VEGETATION

The Crosstimbers and Southern Tallgrass Prairie Ecoregion captures the ecotone between the eastern forests and the southern Great Plains grasslands. Forests, woodlands, savannas, and grasslands all intermingle in a complex mosaic across the landscape.

Within the Texas portion of the ecoregion, major vegetational areas include—from east to west—the Post Oak Savanna, Blackland Prairie, and Crosstimbers and Prairies. The Blackland Prairie includes the main belt as well as two separate grassland belts to the southeast, known as the Fayette and



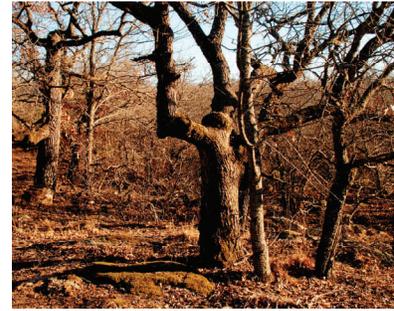
San Antonio prairies. Strata within the Crosstimbers and Prairies include the Grand Prairie and the Eastern and Western Crosstimbers (Hatch et al. 1990).

Although vegetational areas are not as distinctly defined in Oklahoma, Duck and Fletcher (1943) mapped the characteristic vegetation in this ecoregion as primarily tallgrass prairie and post oak–blackjack oak forest, with varying degrees of representation by floodplain, mixedgrass eroded plains, oak–hickory forest, stabilized dune, and sandsage grassland types.

Post oak–blackjack oak (*Quercus stellata*–*Quercus marilandica*) forests and woodlands, associated with sandy to loamy soils, constitute the matrix vegetation for much of the Oklahoma and Kansas portions of the ecoregion, as well as the eastern and western portions of the ecoregion in Texas. Numerous grassland openings, generally on calcareous clay substrates, are found within these forests and woodlands.

Several types of tallgrass prairie are also represented in Texas and Oklahoma, primarily associated with limestone-derived clay soils. In Oklahoma and the Grand Prairie of Texas, grasslands are typically dominated by big bluestem (*Andropogon gerardii*).

In the Texas Blackland Prairie, plant community diversity is high, particularly due to microhabitats created by gilgai and mima mounds. Dominants range from little bluestem (*Schizachyrium scoparium*), big bluestem, and Indiangrass (*Sorghastrum nutans*) on deep Vertisol and Mollisol clays to Silveus' dropseed (*Sporobolus silveanus*) on sandier Alfisols (Eidson and Smeins 1999). Eastern gammagrass (*Tripsacum dactyloides*)-dominated grasslands are



Top photo:  
Old-growth post oaks (*Quercus stellata*) in Montague County, Texas  
© David Stahle, Ancient Cross Timbers Consortium

Middle photo:  
Clasp leaf coneflowers (*Dracopis amplexicaulis*) in bloom at Clymer Meadow Preserve, Texas  
© Robert Parvin

Bottom photo:  
Seed head of eastern gammagrass (*Tripsacum dactyloides*)  
© Robert Parvin

Opposite photo:  
View of the prairie at Clymer Meadow Preserve, Texas  
© Rainie Bishop

## Ecoregional Overview

associated with gilgai microtopography on uplands, as well as on floodplains.

Mixedgrass prairie is found at the western extremes of the region in Oklahoma, where grassland communities are typically dominated by little bluestem and sideoats grama (*Bouteloua curtipendula*).

Large floodplains throughout the ecoregion support communities ranging from extensive bottomland hardwood forests and woodlands of variable composition to wet meadows and sparsely vegetated areas. Riparian areas along smaller streams support narrow gallery forests and woodlands of variable composition.

Wetlands in the ecoregion are diverse due to variable topography/geomorphic settings, precipitation gradients, and hydrologic regimes. Riverine wetlands and oxbow lakes occur in river floodplains and historic river channels, while fringing lacustrine wetlands occur around impoundments. In the southeastern portion of the ecoregion, primarily in areas underlain by deep Eocene sands, graminoid-dominated bogs form on tight soils on hillside seeps and on deep mucky soils in valley bottoms. In the north-western portion of CSTP, depressional wetlands are common in interdunal areas formed from windswept alluvium, where differential soil erosion rates create depressed areas over clay pans. These depressions are often isolated from river channels and groundwater. However, particularly in the headwaters, depressions can be connected to rivers and streams during flood events.

### RIVERS AND AQUATIC ECOSYSTEMS

The Crosstimbers and Southern Tallgrass

Prairie Ecoregion overlaps portions of 7 World Wildlife Fund freshwater ecoregions (Abell et al. 2000). Most of CSTP occurs in the Southern Plains, Central Prairie, Ouachita Highlands, Sabine-Galveston, and East Texas Gulf freshwater ecoregions with very small portions in the Ozark Highlands and West Texas Gulf.

Eleven major river basins cross CSTP. The Arkansas, Neosho, Cimarron, Canadian, and Red river basins are tributaries of the Mississippi River, and the Sabine, Trinity, Brazos, Colorado, Guadalupe/San Antonio, and Nueces river basins drain into the Gulf of Mexico.

The varied physiographic and climatic settings of CSTP and the surrounding regions combine to create a broad array of aquatic habitats. Aquatic ecosystems in this ecoregion range from wide sandy-bed plains rivers to clear flowing springs to higher gradient creeks of the Arbuckle Mountains.

The ecoregion's rivers are some of its most prominent features. Due to their highly variable hydrology (resulting from varied seasonal precipitation patterns), high summer temperatures, and low winter temperatures, the Arkansas, Cimarron, Canadian, Washita, and Red rivers represent some of the harshest and most dynamic aquatic ecosystems in the United States (Matthews et al. 2005). The large rivers and tributaries that eventually flow into the Gulf of Mexico support a diversity of aquatic habitats, reflecting varied geology, climate, and precipitation patterns (Dahm et al. 2005).

The eastern portions of the ecoregion in Arkansas, Kansas, and Oklahoma reflect the influence of the adjacent Ozark and



Above photos:  
Diverse array of riparian and aquatic  
habitats in the ecoregion  
All © Jona Tucker

## Ecoregional Overview

Ouachita highlands. These higher gradient streams and rivers have more diverse habitat features, as well as more stable hydrologic regimes (particularly along the Ozark boundary) due to significant groundwater input from springs (Matthews et al. 2005). Similar aquatic habitats occur in streams of the Arbuckle Mountains.

On the southwestern margin of the ecoregion, the Edwards Aquifer discharges artesian waters through several major spring systems that contain highly imperiled endemic aquatic fauna. These springs form the headwaters of several river systems that support an array of aquatic biodiversity adapted to the clear waters and naturally stable hydrology (Dahm et al. 2005).

### BIODIVERSITY STATUS

Vegetation in the Crosstimbers and Southern Tallgrass Prairie Ecoregion has been highly modified, especially in Texas and to a lesser extent in Oklahoma.

In Texas, almost all arable lands in this ecoregion were converted to row crop agriculture by the turn of the 20<sup>th</sup> century. For example, by the mid-1920s more than 80 percent of the 12 million acres of Texas Blackland Prairie were under cultivation (Bland and Jones, 1993). It is commonly estimated that less than one percent of the original Blackland Prairie vegetation remains (Smeins and Diamond 1983). Many grassland community types that occur in the ecoregion are considered imperiled because existing remnants are isolated, fragmented, and dramatically reduced in areal extent.

Urbanization has further diminished natural and semi-natural landscapes.

Major cities, including Dallas, Fort Worth, Austin and San Antonio in Texas, and Tulsa and Oklahoma City in Oklahoma, continue—at a rapid pace—to generate suburban and exurban development converting both farmland and natural areas to residential and supporting urban uses.

As a result of these past and current land use patterns, areas of existing native vegetation tend to be highly to moderately fragmented. However, many of these remnants may be relatively large and of biological significance.

For example, Stahle (1996) proposed that the largest concentration of old-growth woodlands in the eastern half of the United States may occur on sandstone ridges within CSTP. The short-statured, gnarled post and blackjack oak trees weren't considered suitable timber by the logging industry, and the steep, harsh terrain made the land ill-suited for farming or grazing. As a result, many of these xeric sites support trees that are centuries-old.

Within relatively intact portions of the ecoregion, fire suppression has led to increased woody cover within grasslands and closure of canopy within savannas and woodlands. These changes in the landscape, along with habitat fragmentation and conversion, have negatively impacted many species, including birds. Grassland birds, such as Le Conte's sparrow (*Ammodramus leconteii*) and dickcissel (*Sptiza americana*), have shown steeper and more significant declines than any other group of North American species (Knopf 1994; Samson and Knopf 1996; Brennan and Kuvlesky 2005). The black-capped vireo (*Vireo atricapilla*), a federally-listed endangered species occurring within but not limited



Top photo:  
Texas beebalm (*Monarda viridissima*),  
a rare species that is endemic to this  
ecoregion  
© Bill Carr

Bottom photo:  
Le Conte's sparrow (*Ammodramus  
leconteii*), a grassland species found  
in this ecoregion during the winter  
season  
© Malcolm Swan

## Ecoregional Overview

to the ecoregion, is affected by canopy closure. Canopy closure, fostered by the increase of eastern redcedar (*Juniperus virginiana*) in fire-suppressed stands, has led to increased populations of brown-headed cowbirds (*Molothrus ater*) and nest parasitism, which in turn negatively affects black-capped vireo reproduction (Grzybowski et al. 1994).

The aquatic fauna in the region reflect the diversity in aquatic habitats. Included are species associated with large rivers (e.g., shovelnose sturgeon *Scaphirhynchus platyrhynchus*, Arkansas River shiner *Notropis girardi*, and Red River shiner *Notropis bairdi*), species adapted to spring habitats (e.g., spring salamanders of the genus *Eurycea*, Arkansas darter *Etheostoma cragini*, fountain darter *Etheostoma fonticola*, and Comal Springs riffle beetle *Heterelmis comalensis*), and species with narrow distributions with at least a portion of their ranges in the ecoregion (e.g., Neosho madtom *Noturus placidus*, small-eye shiner *Notropis buccula*, redspot chub *Nocomis asper*, Cagle's map turtle *Graptemys caglei*, and golden orb mussel *Quadrula aurea*).

Freshwater habitats have been widely altered in this ecoregion. Construction of dams, levees, and channels has dramatically changed the natural flow of many rivers. Widespread urbanization and incompatible agricultural practices have reduced water quality and destroyed habitats. As a result, many of the unique species in CSTP have experienced major declines in their populations, with some being nearly extirpated from the ecoregion. Also of conservation concern in the ecoregion are several broadly distributed species that have seen declines across their ranges (e.g., paddlefish *Polyodon spathula*, western sand darter

*Ammocrypta clara*, and rabbitsfoot mussel *Quadrula cylindrica*).

### LAND USE

The Crosstimbers and Southern Tallgrass Prairie Ecoregion is densely populated, and contains many of the large metropolitan areas in both Texas and Oklahoma. For example, the Dallas-Fort Worth-Arlington metropolitan area includes more than six million residents, and, over the past four years, has grown by at least 150,000 residents each year. Both the Austin-Round Rock and San Antonio metropolitan areas exceed 1.5 million residents. In Oklahoma, the Tulsa and Oklahoma City metropolitan areas support more than 900,000 and 1,000,000 residents, respectively, but are not growing at the rate of the Texas population centers (United States Census Bureau, 2007).

Concentric ring development—where new development encircles the older original city center—is common and proceeding at a rapid pace, particularly in north and central Texas. Land and infrastructure costs are lower at the urban fringe and within rural areas, resulting in conversion of farm and open space to urban use rather than redevelopment of the city core.

Various agricultural activities (row crop cultivation, hay production, and livestock grazing on native rangelands and “improved” pastures) dominate the landscape of this ecoregion.

Much of the Texas portion of the ecoregion, especially in the Blackland Prairie belts, was under row crop cultivation (corn, wheat, cotton, and sorghum) by the turn of the last century. Since the 1940s, some former cropland



Top photo:  
Old-growth crosstimbers forest cleared for property development in Oklahoma  
© David Stahle, Ancient Cross Timbers Consortium

Middle photo:  
Hay bales at Clymer Meadow Preserve, Texas  
© The Nature Conservancy

Bottom photo:  
Cattle grazing in a pasture  
© Chris Helzer

## Ecoregional Overview

has been converted to “tame” pasture or allowed to revert back to natural or semi-natural grassland.

Forage production for cattle is the most important agricultural use of land in the Grand Prairie and Crosstimbers of Texas. However, large landholdings and cattle ranching as a livelihood are being replaced by avocational ranching on smaller landholdings owned by urban expatriates. In Oklahoma, conversion to row crop agriculture has occurred to a lesser extent, and much of the land has traditionally been used for cattle forage production. However, in the vicinity of urban areas, loss of larger ranches to subdivision has occurred.

Oil and gas exploration and production are growing at an exponential rate in the ecoregion. Due to advances in technology, the Barnett Shale is now accessible to drilling. This underground natural gas field—potentially the largest onshore gas

field in the United States—spans approximately 5,000 square miles and seventeen counties in north-central Texas. Wind energy development is also becoming more commonplace in areas of the ecoregion.

Proper siting of these oil, gas, and wind energy facilities and associated infrastructure (e.g., roads, pipelines, and utility lines) will be key to minimizing both direct and indirect impacts (from mortality, habitat fragmentation, avoidance effects, and introduction of invasives) on wildlife and their habitat.



Top photo:  
Wind farm in Oklahoma  
© Jay Pruett

Bottom photo:  
Pad site construction for a gas well in  
the Barnett Shale region  
© David Bezanson

Opposite photo:  
View of a ranch in north Texas  
© David Bezanson

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Top photo:  
Texas horned lizard (*Phrynosoma cornutum*)  
© Mike Duran

Bottom photo:  
Little bluestem (*Schizachyrium scoparium*) seed head  
© Harvey Payne

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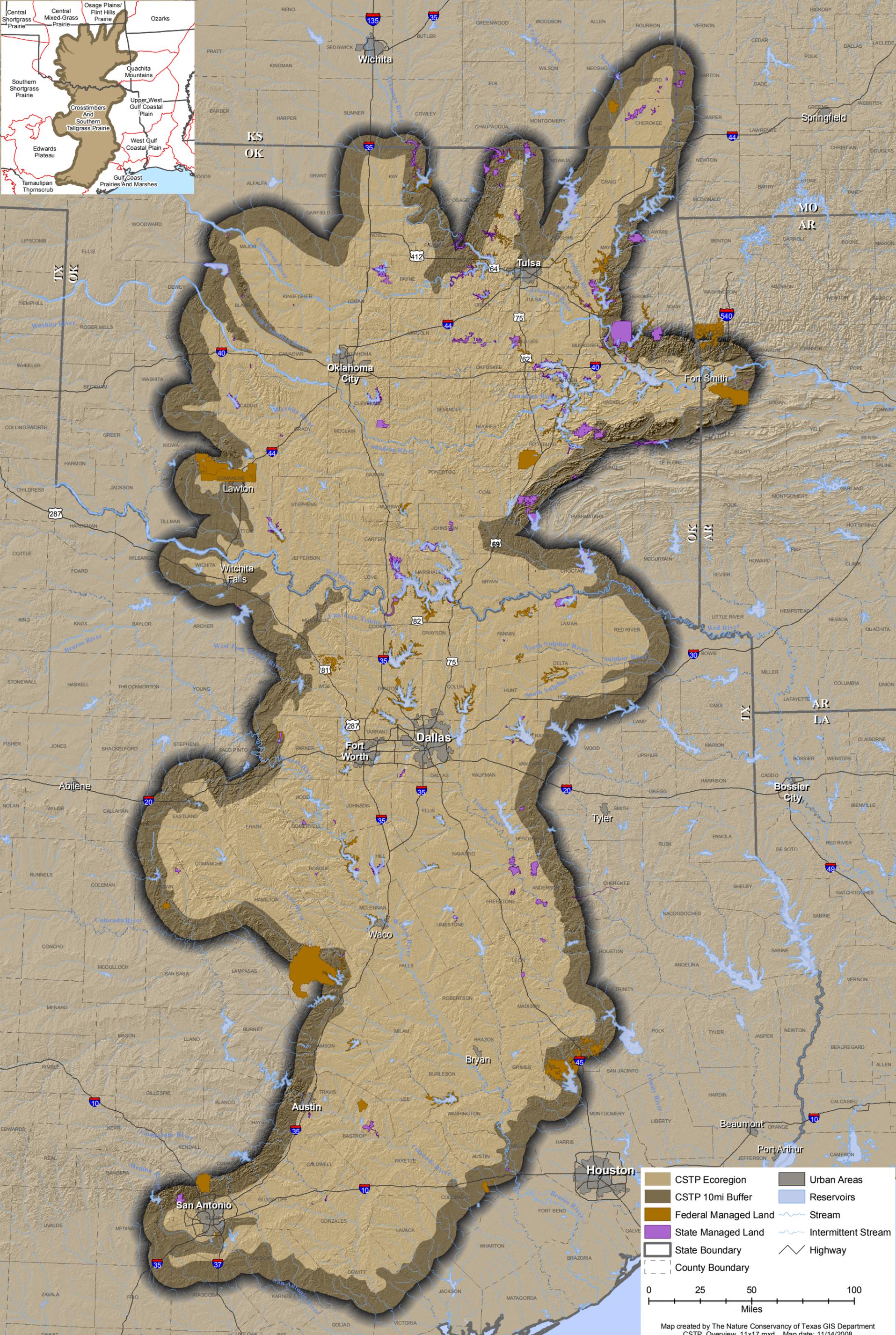
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Top photo:  
Crosstimbers forest in Keystone  
Ancient Forest Preserve, Oklahoma  
© Jay Pruett

Opposite photo:  
Blooming branched gay-feather  
(*Liatris cymosa*), a rare species found  
almost exclusively in this ecoregion  
© Jason Singhurst

# Crosstimbers and Southern Tallgrass Prairie Ecoregion



CSTP Ecoregion	CSTP 10mi Buffer	Urban Areas
Federal Managed Land	State Managed Land	Reservoirs
State Boundary	Stream	Intermittent Stream
County Boundary	Highway	

0 25 50 100  
Miles

Map created by The Nature Conservancy of Texas GIS Department  
CSTP\_Overview\_11x17.mxd Map date: 11/14/2008

# Crosstimbers and Southern Tallgrass Prairie Ecoregion Terrestrial Portfolio

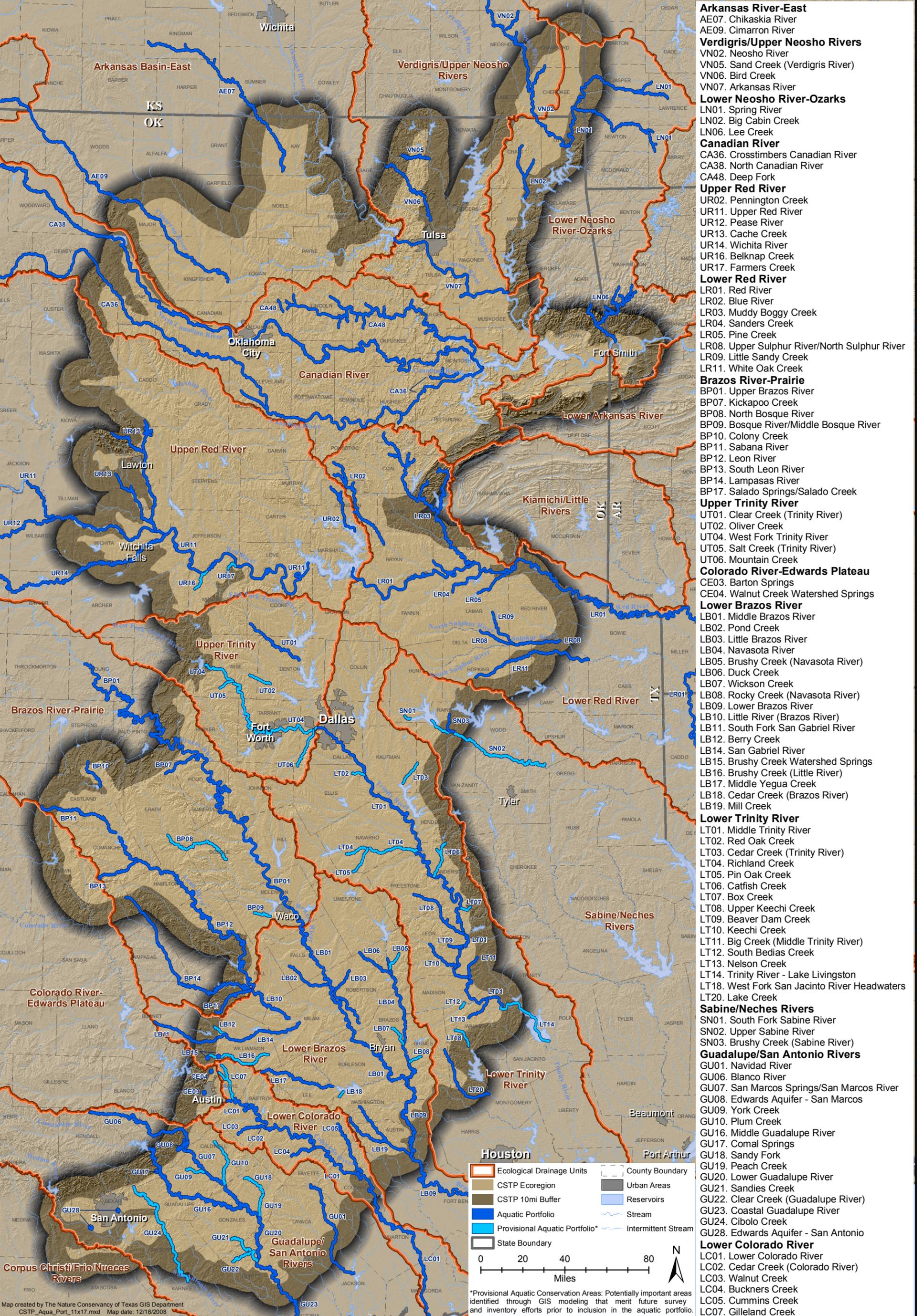
This map identifies a set of priority areas for the protection of biological diversity in the Crosstimbers and Southern Tallgrass Prairie Ecoregion. The Nature Conservancy is working cooperatively with private landowners, natural resource agencies and private conservation organizations to achieve conservation success at these sites. This is not a map of land acquisition priorities. A broad array of strategies is essential for achieving long-term conservation of native species, plant communities and ecosystems within this ecoregion. Protection of areas that are not identified on this map, or are located outside the portfolio boundaries, may still contribute to conservation success. The selection of conservation areas is based on current knowledge and will be refined over time.



- Northern Crosstimbers**
- NC01. Cow Creek
  - NC02. Lightning Creek
  - NC03. Elk Prairie
  - NC04. Cimarron River Floodplain
  - NC05. Keystone Woodlands
  - NC06. Arkansas River-Tulsa
  - NC07. Verdigris River/Horseshoe Lake
  - NC08. Mayes County Grasslands
  - NC09. Fort Gibson WMA
  - NC10. McClellan-Kerr WMA
  - NC11. Lincoln/Logan Savannas
  - NC12. Deep Fork
  - NC13. Dirty Creek
  - NC14. Lexington WMA
  - NC15. Maud Wetland
  - NC16. Lake Eufaula Old-Growth Crosstimbers
  - NC17. Lake Eufaula Tributaries
  - NC18. Arkansas River Valley Prairies
  - NC19. Cherokee Prairies
  - NC20. Canadian River (Crosstimbers)
  - NC21. Caddo Canyonlands
  - NC22. Grady/McClain County Grasslands
  - NC23. Grady County Grasslands
  - NC24. Coal County Woodlands
  - NC25. McAlester
  - NC26. Arbuckle Mountains
  - NC27. Arbuckle Plains
  - NC28. Washita River Floodplain
  - NC29. Boggy Seeps
  - NC30. Pipewort Haven
  - NC31. Hagerman NWR
  - NC32. Red River (East of Lake Texoma)
  - NC33. Caddo National Grasslands-Bois d'Arc Creek
  - NC34. Camp Maxey/Pat Mayse
  - NC35. Woodfin/Tridens Prairie
- Western Tallgrass & Crosstimbers**
- WT01. Stillwater Prairies
  - WT02. Cimarron Terrace Wetlands
  - WT03. Watonga Wetlands
  - WT04. Canadian River Wetlands
  - WT05. Wichita Mountains/Fort Sill
  - WT06. Jefferson County Grasslands
  - WT07. Red River Floodplain
  - WT08. Wichita County
  - WT09. Henrietta Range
  - WT10. Montague County Crosstimbers
  - WT11. Northern Cooke County Grasslands
  - WT12. Eastern Crosstimbers
  - WT13. Cooke County Grasslands
  - WT14. Era/Gainesville Prairies
  - WT15. Wise County Crosstimbers North
  - WT16. Ray Roberts Prairie
  - WT17. Wise County Crosstimbers South
  - WT18. Dyksterhuis Woodlands and Prairies
  - WT19. Fort Worth Prairies
- Southwestern Tallgrass & Crosstimbers**
- ST01. Mineral Wells Crosstimbers
  - ST02. Southwestern Crosstimbers
  - ST03. Hood County Prairies
  - ST04. Southern Fort Worth Prairies
  - ST05. Somervell County Prairies
  - ST06. Bosque Prairies and Woodlands
  - ST07. Crawford Bushlands
  - ST08. Meridian Plateau
  - ST09. Lampasas Cut Plain Grasslands
- Northern Blackland Prairie**
- NB01. Caddo National Grasslands-Ladonia
  - NB02. Clymer Meadow
  - NB03. South Sulphur River Floodplain
  - NB04. Mathews Prairie
- Southern Blackland Prairie**
- SB01. Dogwood Cuesta
  - SB02. Great Trinity Floodplain Forest
  - SB03. MCR Prairie
  - SB04. Limestone Savannas
  - SB05. Robber Baron Cave
  - SB06. Bexar Invertebrate Cave Complex 1
  - SB07. Bexar Invertebrate Cave Complex 2
  - SB08. Caracol Creek Coon Cave
- Post Oak Savanna**
- PS01. Pecan Bayou
  - PS02. Sulphur River Floodplain
  - PS03. White Oak Creek
  - PS04. Knight Prairie
  - PS05. Manning/Wingo Prairie
  - PS06. Cedar Creek
  - PS07. Trinity River Floodplain
  - PS08. Middle Trinity
  - PS09. Limestone Oaks
  - PS10. Navasota/Carrizo Sands
  - PS11. Burleson
  - PS12. Lake Somerville
  - PS13. Bastrop Lost Pines
  - PS14. Bellville Prairie
  - PS15. Carrizo Sands-Northwestern Segment
  - PS16. Salem
  - PS17. Carrizo Sands-Southwestern Segment
  - PS18. Guadalupe River Floodplain
  - PS19. St. John Blackland Prairies
  - PS20. Lavaca/Colorado County Crosstimbers
  - PS21. DeWitt County Crosstimbers
- Legend**
- Stratification Units (Orange outline)
  - State Boundary (Grey outline)
  - CSTP Ecoregion (Light Green)
  - CSTP 10mi Buffer (Dark Green)
  - Terrestrial Portfolio (Light Green)
  - Intermittent Stream (Blue dashed line)
  - Stream (Blue solid line)
  - County Boundary (Grey dashed line)
  - Urban Areas (Grey solid)
  - Reservoirs (Blue solid)
- Scale:** 0, 20, 40, 80 Miles
- Map created by The Nature Conservancy of Texas GIS Department  
CSTP\_Terr\_Port\_11x17.mxd Map date: 11/14/2008**

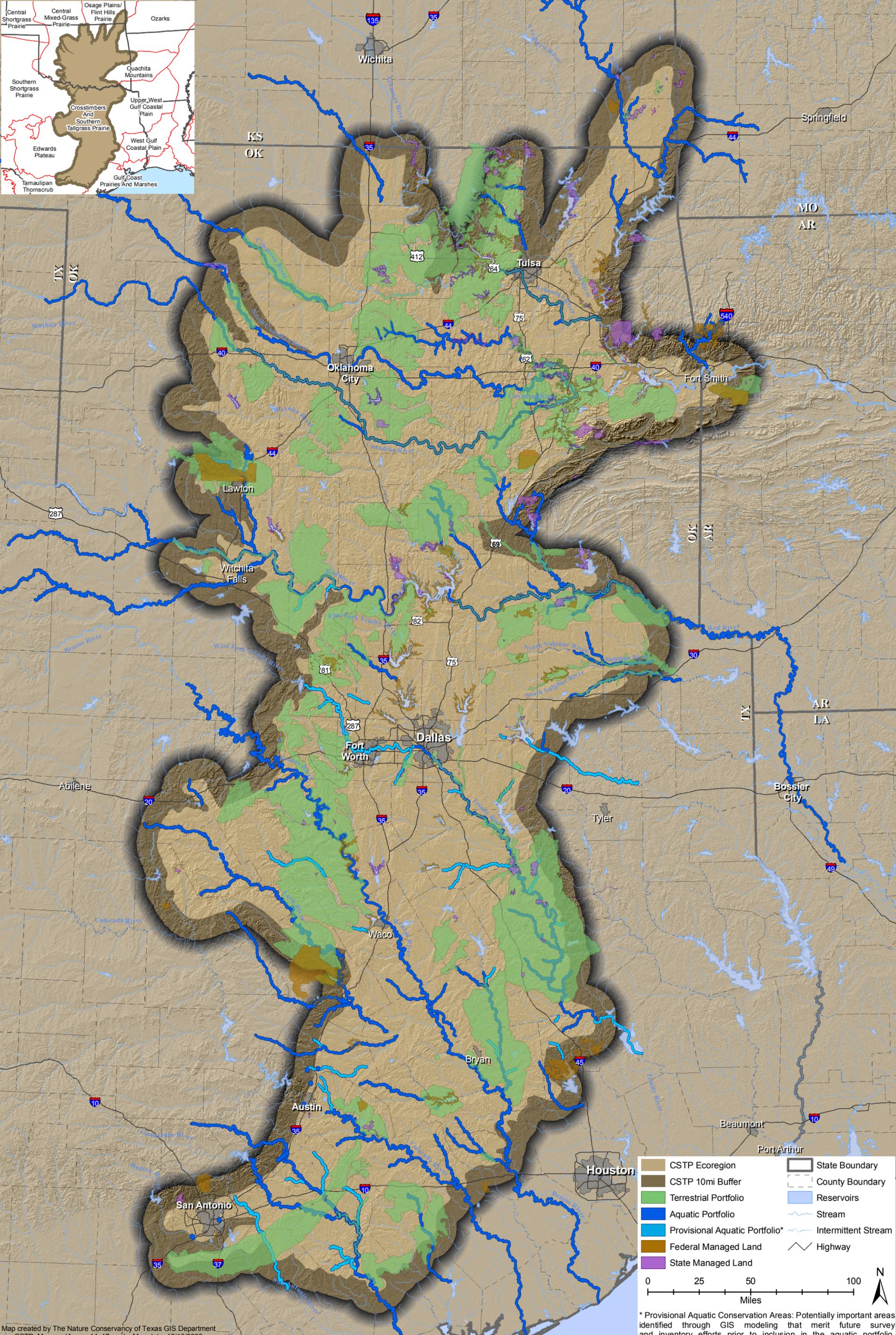
# Crosstimbers and Southern Tallgrass Prairie Ecoregion Aquatic Portfolio

This map identifies a set of priority areas for the protection of biological diversity in the Crosstimbers and Southern Tallgrass Prairie Ecoregion. The Nature Conservancy is working cooperatively with private landowners, natural resource agencies and private conservation organizations to achieve conservation success at these sites. This is not a map of land acquisition priorities. A broad array of strategies is essential for achieving long-term conservation of native species and aquatic ecosystems within this ecoregion. Protection of areas that are not identified on this map, or are located outside the portfolio boundaries, may still contribute to conservation success. The selection of conservation areas is based on current knowledge and will be refined over time.



- Arkansas River-East**  
AE07. Chikaskia River  
AE09. Cimarron River
- Verdigris/Upper Neosho Rivers**  
VN02. Neosho River  
VN05. Sand Creek (Verdigris River)  
VN06. Bird Creek  
VN07. Arkansas River
- Lower Neosho River-Ozarks**  
LN01. Spring River  
LN02. Big Cabin Creek  
LN06. Lee Creek
- Canadian River**  
CA36. Crosstimbers Canadian River  
CA38. North Canadian River  
CA48. Deep Fork
- Upper Red River**  
UR02. Pennington Creek  
UR11. Upper Red River  
UR12. Pease River  
UR13. Cache Creek  
UR14. Wichita River  
UR16. Belknap Creek  
UR17. Farmers Creek
- Lower Red River**  
LR01. Red River  
LR02. Blue River  
LR03. Muddy Boggy Creek  
LR04. Sanders Creek  
LR05. Pine Creek  
LR08. Upper Sulphur River/North Sulphur River  
LR09. Little Sandy Creek  
LR11. White Oak Creek
- Brazos River-Prairie**  
BP01. Upper Brazos River  
BP07. Kickapoo Creek  
BP08. North Bosque River  
BP09. Bosque River/Middle Bosque River  
BP10. Colony Creek  
BP11. Sabana River  
BP12. Leon River  
BP13. South Leon River  
BP14. Lampasas River  
BP17. Salado Springs/Salado Creek
- Upper Trinity River**  
UT01. Clear Creek (Trinity River)  
UT02. Oliver Creek  
UT04. West Fork Trinity River  
UT05. Salt Creek (Trinity River)  
UT06. Mountain Creek
- Colorado River-Edwards Plateau**  
CE03. Barton Springs  
CE04. Walnut Creek Watershed Springs
- Lower Brazos River**  
LB01. Middle Brazos River  
LB02. Pond Creek  
LB03. Little Brazos River  
LB04. Navasota River  
LB05. Brushy Creek (Navasota River)  
LB06. Duck Creek  
LB07. Wickson Creek  
LB08. Rocky Creek (Navasota River)  
LB09. Lower Brazos River  
LB10. Little River (Brazos River)  
LB11. South Fork San Gabriel River  
LB12. Berry Creek  
LB14. San Gabriel River  
LB15. Brushy Creek Watershed Springs  
LB16. Brushy Creek (Little River)  
LB17. Middle Yegua Creek  
LB18. Cedar Creek (Brazos River)  
LB19. Mill Creek
- Lower Trinity River**  
LT01. Middle Trinity River  
LT02. Red Oak Creek  
LT03. Cedar Creek (Trinity River)  
LT04. Richland Creek  
LT05. Pin Oak Creek  
LT06. Catfish Creek  
LT07. Box Creek  
LT08. Upper Keechi Creek  
LT09. Beaver Dam Creek  
LT10. Keechi Creek  
LT11. Big Creek (Middle Trinity River)  
LT12. South Bédias Creek  
LT13. Nelson Creek  
LT14. Trinity River - Lake Livingston  
LT18. West Fork San Jacinto River Headwaters  
LT20. Lake Creek
- Sabine/Neches Rivers**  
SN01. South Fork Sabine River  
SN02. Upper Sabine River  
SN03. Brushy Creek (Sabine River)
- Guadalupe/San Antonio Rivers**  
GU01. Navidad River  
GU06. Blanco River  
GU07. San Marcos Springs/San Marcos River  
GU08. Edwards Aquifer - San Marcos  
GU09. York Creek  
GU10. Plum Creek  
GU16. Middle Guadalupe River  
GU17. Comal Springs  
GU18. Sandy Fork  
GU19. Peach Creek  
GU20. Lower Guadalupe River  
GU21. Sandies Creek  
GU22. Clear Creek (Guadalupe River)  
GU23. Coastal Guadalupe River  
GU24. Cibolo Creek  
GU28. Edwards Aquifer - San Antonio
- Lower Colorado River**  
LC01. Lower Colorado River  
LC02. Cedar Creek (Colorado River)  
LC03. Walnut Creek  
LC04. Buckners Creek  
LC05. Cummins Creek  
LC07. Gilleland Creek

# Crosstimbers and Southern Tallgrass Prairie Ecoregion Portfolios & Public Lands



CSTP Ecoregion	State Boundary
CSTP 10mi Buffer	County Boundary
Terrestrial Portfolio	Reservoirs
Aquatic Portfolio	Stream
Provisional Aquatic Portfolio*	Intermittent Stream
Federal Managed Land	Highway
State Managed Land	

0 25 50 100  
Miles

\* Provisional Aquatic Conservation Areas: Potentially important areas identified through GIS modeling that merit future survey and inventory efforts prior to inclusion in the aquatic portfolio.

# Crosstimbers and Southern Tallgrass Prairie Ecoregion

## DESCRIPTIONS OF TERRESTRIAL CONSERVATION AREAS

(listed alphabetically by state)

*\*The conservation areas and their descriptions are considered a work in progress. Comments are always welcome.*

## Cherokee Prairies

CA Type: Terrestrial  
Map #: NC19  
State: AR

Size: 124,415 acres (50,349 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Cherokee Prairies Conservation Area overlaps with a conservation area (also known as Cherokee Prairies) in The Nature Conservancy's Ouachita Mountains Ecoregional Plan. Most of the area is actually within the Ouachita Mountains Ecoregion and the 10-mile buffer zone of this ecoregion. The area occurs entirely in Arkansas, covering portions of Sebastian, Crawford, and Franklin counties. The Cherokee Prairies represent the largest remaining tracts of tallgrass prairie in the Arkansas River Valley of west-central Arkansas.

The matrix ecological system in this conservation area is Arkansas Valley Prairie and Woodland, which includes dry tallgrass prairie, mesic tallgrass prairie, and seasonally flooded tallgrass prairie. Several good quality occurrences of terrestrial communities and prairie mole cricket (*Gryllotalpa major*, G3) are present within the area. American burying beetle (*Nicrophorus americanus*, G2G3), a federally-listed species, has been documented at several locations but viability of these occurrences is unknown. Henslow's sparrow (*Ammodramus henslowii*, G4) and Le Conte's sparrow (*Ammodramus leconteii*, G4) have been observed in the conservation area.

Threats to targets in the conservation area include conversion, fire suppression, and invasive species.

## Cow Creek

CA Type: Terrestrial  
Map #: NC01  
State: KS

Size: 9,428 acres (3,815 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Lightning Creek

CA Type: Terrestrial

Map #: NC02

State: KS

Size: 17,432 acres (7,054 hectares)

Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Arbuckle Mountains

CA Type: Terrestrial  
Map #: NC26  
State: OK

Size: 112,552 acres (45,548 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Arbuckle Plains

CA Type: Terrestrial  
Map #: NC27  
State: OK

Size: 468,594 acres (189,633 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Arkansas River-Tulsa

CA Type: Terrestrial  
Map #: NC06  
State: OK

Size: 31,041 acres (12,562 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Arkansas River-Tulsa Conservation Area stretches from the confluence of the Arkansas and Neosho rivers, upstream to the confluence of the Cimarron and Arkansas rivers. The conservation area runs through the city of Tulsa, covering parts of Tulsa, Wagoner, and Muskogee counties. This large river is a major tributary of the Missouri River.

This conservation area was selected for the numerous sand bars and islands that are known nesting habitat for the interior least tern (*Sternula antillarum athalassos*, G4T2Q).

This portion of the Arkansas River has been heavily impacted by human activities, including main-stem dams (regulated water releases), industrial/commercial point source pollution, and sedimentation due to agricultural practices (The Nature Conservancy 2000).

#### Literature Cited

The Nature Conservancy, Osage Plains/Flint Hills Prairie Ecoregional Planning Team. 2000. Ecoregional Conservation in the Osage Plains/Flint Hills Prairie. The Nature Conservancy, Midwestern Resource Office, Minneapolis, MN.

## Arkansas River Valley Prairies

CA Type: Terrestrial  
Map #: NC18  
State: OK

Size: 269,402 acres (109,023 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Arkansas River Valley Prairies occur along the Arkansas River in Haskell and Le Flore counties. These prairies occur as scattered remnants (approximately 100 acres in size) amid a woodland matrix. Arkansas Valley Prairie and Woodland is the matrix ecological system, with big bluestem (*Andropogon gerardii*), yellow indiagrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), and little bluestem (*Schizachyrium scoparium*) as common community components. Forested areas include green ash - American elm (*Fraxinus pennsylvanica* - *Ulmus americana*) communities. The bottomlands are punctuated with mima mounds over Pennsylvania sandstone. American burying beetle (*Nicrophorus americana*, G2G3) is represented by several examples, though viability of all the occurrences is unknown. A viable occurrence of western prairie white-fringed orchid (*Platanthera praeclara*, G2), the only one captured in a conservation area in this ecoregion, is also found in this conservation area. Northern scarlet snake (*Cemophora coccinea copei*, G5T5) also occurs in the conservation area.

Threats include incompatible management, development, and succession to woody cover due to lack of fire, grazing, or haying.

## Boggy Seeps

CA Type: Terrestrial  
Map #: NC29  
State: OK

Size: 62,763 acres (25,399 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Caddo Canyonlands

CA Type: Terrestrial  
Map #: NC21  
State: OK

Size: 139,841 acres (56,592 hectares)

Stratification Unit: Northern Crosstimbers, Western Tallgrass and Crosstimbers

### DESCRIPTION

The Caddo Canyonlands Conservation Area encompasses a series of Permian-age sandstone canyons and rolling sandhills in northern Caddo and southwestern Canadian counties. Isolated canyons along Sugar Creek and tributaries support relict stands of sugar maple (*Acer saccharum*, locally called “Caddo Maple”), ferns, and other mesic vegetation disjunct from the woodlands of eastern Oklahoma. Federally listed as endangered, the black-capped vireo (*Vireo atricapilla*, G2G3) was known to occur in Methodist Canyon through the early 1990s, and a small population of questionable long-term viability may persist in areas of favorable habitat.

Red Rock Canyon State Park includes 310 acres of land along the upper reach of the canyon, near the town of Hinton. The park is used for camping, fishing, and rock rappelling by area residents, and receives extensive foot traffic in the summer months.

The Caddo Canyonlands Conservation Area has been heavily impacted by agriculture. Cotton, wheat, grain sorghum, peanuts, and other row crops were once grown across much of Caddo and Canadian counties. Some formerly cropped areas have been restored to native grass cover or converted to tame pasture in recent years; however, evidence of severe soil erosion persists. Current threats include oil and gas development, residential development, wind energy development, and altered fire regimes.

## Canadian River (Crosstimbers)

CA Type: Terrestrial  
Map #: NC20  
State: OK

Size: 86,175 acres (34,874 hectares)

Stratification Unit: Northern Crosstimbers, Western Tallgrass and Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Canadian River Wetlands

CA Type: Terrestrial  
Map #: WT04  
State: OK

Size: 93,466 acres (37,824 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Canadian River Wetlands Conservation Area is located in southwestern Blaine and eastern Custer counties. Target elements include wetland plant communities found along small tributaries of the Canadian River and Deer Creek, and lentic wetlands (including man-made ponds) found within a matrix of agricultural fields on uplands. The lentic wetlands may be used as stopover sites by migrating waterfowl, particularly during wet years (B. Hoagland, personal communication, 2008).

Row crop agriculture is the major land use in this region. Threats include agricultural conversion, altered grazing regime, oil and gas development, and wind energy development.

## Cimarron River Floodplain

CA Type: Terrestrial  
Map #: NC04  
State: OK

Size: 22,097 acres (8,942) hectares  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Cimarron River originates in the high plains of Colfax County, New Mexico, and meanders 670 miles east to its confluence with the Arkansas River near Tulsa, Oklahoma (Steuter et al. 2003). In its eastern reaches, the river is perennial and flows across a wide, braided channel of coarse sand. The Cimarron River Floodplain Conservation Area encompasses the river and floodplain along the southern boundary of Payne County.

Gently sloping windblown sand dunes may be found on either side of the river. Narrow belts of cottonwood, sandbar willow, and black willow are often found along the riverbanks. In other areas, various wet prairie and marsh associations are observed. Eastern redcedar is abundant in riparian woodlands and upland areas along the length of the site (Steuter et al. 2003). Saltcedar appears in some areas, and may be increasing.

The western portion of the conservation area has been designated as essential habitat for the interior least tern (*Sterna antillarum athalassos*, G4T2Q) by the U.S. Fish and Wildlife Service (Sidle and Harrison 1990).

Threats include agricultural conversion, invasive species (*Tamarix* spp.), hydrologic modification, residential development, oil and gas development, and recreational ATV use.

#### Literature Cited:

Sidle, J. G., and W. F. Harrison. 1990. Recovery Plan for the Interior Population of the Least Tern (*Sterna antillarum*). U.S. Department of the Interior, Fish and Wildlife Service, Grand Island, NE.

Steuter, A., J. S. Hall, and M. L. Khoury. 2003. Conserving the Biological Diversity of the Central Mixed-Grass Prairie: A Portfolio Designed for Conservation Action. The Nature Conservancy, Nebraska Field Office, Omaha, NE.

## Cimarron Terrace Wetlands

CA Type: Terrestrial  
Map #: WT02  
State: OK

Size: 177,215 acres (71,716) hectares  
Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Cimarron Terrace Wetlands Conservation Area encompasses a number of closed depression ephemeral wetlands along the Cimarron River valley in Major, Kingfisher, and Logan counties. These wetland sites range from very small to large (200 ac.) irregular depressions formed by historic stream channels and/or windblown alluvium. The vegetation found at these wetlands is highly variable, but typically includes emergent aquatic vegetation (sedges, rushes, smartweed) with an overstory of native shrubs and/or trees (Henley and Harrison 2001).

Row crop agriculture is the major land use in this region. Several confined animal feeding operations (hog farms) are located in the conservation area. Threats include agricultural conversion, industrial hog farms, improper herbicide/pesticide use, hydrologic modification, and residential development.

#### Literature Cited

Henley, J. E. and M. S. Harrison. 2001. The Oklahoma Wetlands Reference Guide. Oklahoma Conservation Commission, Oklahoma City.

## Coal County Woodlands

CA Type: Terrestrial  
Map #: NC24  
State: OK

Size: 139,895 acres (56,614) hectares  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Deep Fork

CA Type: Terrestrial

Map #: NC12

State: OK

Size: 63,307 acres (25,619) hectares

Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Dirty Creek

CA Type: Terrestrial  
Map #: NC13  
State: OK

Size: 9,541 acres (3,861 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Elk Prairie

CA Type: Terrestrial

Map #: NC03

State: OK

Size: 754,918 acres (305,504 hectares)

Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Elk Prairie Conservation Area is identical to the conservation area (with the same name) identified in the Osage Plains/Flint Hills Prairie Ecoregional Assessment. It is described in that assessment as follows: “This site comprises one of the largest remaining areas of intact crosstimbers landscape in North America. The topography consists of a series of low cuervas or escarpments separating level to gently rolling plains on Pennsylvanian shale, limestone, and sandstone. Elk Prairie includes a number of high quality occurrences of Midwest Sandstone/Shale Prairie and Post Oak-Blackjack Oak Crosstimbers Woodland. Threats include development, dams, exotic/invasive species, and conversion of native grasslands to cropland and tame grass (The Nature Conservancy 2000).”

#### Literature Cited

The Nature Conservancy, Osage Plains/Flint Hills Prairie Ecoregional Planning Team. 2000. Ecoregional Conservation in the Osage Plains/Flint Hills Prairie. The Nature Conservancy, Midwestern Resource Office, Minneapolis, MN.

## Fort Gibson WMA

CA Type: Terrestrial  
Map #: NC09  
State: OK

Size: 14,425 acres (5,837 hectares)

Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Fort Gibson WMA Conservation Area is located just northeast of Wagoner in Wagoner and Cherokee Counties. The area is based around the 21,798-acre Fort Gibson Wildlife Management Area (owned by the Oklahoma Department of Wildlife Conservation) and the Fort Gibson State Waterfowl Refuge (owned by the U.S. Army Corps of Engineers).

Fort Gibson WMA is a mixture of upland and bottomland habitats. Upland areas consist of tallgrass prairie, shrubland, and woodland in various stages of succession. Bell's vireo (*Vireo bellii*, G5) occurs within these areas. Bottomland areas consist of oak-hickory forest with cottonwood and sycamores in and around Fort Gibson Lake. Extensive riparian forest is protected along streams within the area. Wetland areas are known to harbor king rail (*Rallus elegans*, G4).

Threats include fragmentation from development, fire exclusion, and invasive species--especially eastern redcedar (*Juniperus virginiana*) and sericea lespedeza (*Lespedeza cuneata*).

## Grady County Grasslands

CA Type: Terrestrial  
Map #: NC23  
State: OK

Size: 154,828 acres (62,657 hectares)

Stratification Unit: Northern Crosstimbers, Western Tallgrass and Crosstimbers

### DESCRIPTION

The Grady County Grasslands Conservation Area is located in southern Grady and western Garvin counties. This area was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001). It appears to contain intact areas of native mixed- and tallgrass prairie, as well as crosstimbers woodland. Detailed information about the biodiversity significance of this site is currently unavailable.

Threats include altered fire regime, altered grazing regime, and oil and gas development.

## Grady/McClain County Grasslands

CA Type: Terrestrial  
Map #: NC22  
State: OK

Size: 255,269 acres (103,304 hectares)

Stratification Unit: Northern Crosstimbers, Western Tallgrass and Crosstimbers

### DESCRIPTION

The Grady/McClain County Grasslands Conservation Area is located between the Canadian and Washita rivers in central Oklahoma, southwest of the Oklahoma City metropolitan area. This area was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001). It appears to contain intact areas of native mixed- and tallgrass prairie and crosstimbers woodland. At least 1 large (approximately 1,000 acres) prairie dog complex is located in the far southern portion of the conservation area, east of Lindsay. Further detailed information about the biodiversity significance of this site is currently unavailable.

Threats include altered fire regime, altered grazing regime, prairie dog poisoning, and oil and gas development.

## Jefferson County Grasslands

CA Type: Terrestrial

Map #: WT06

State: OK

Size: 293,825 acres (118,907 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers, Northern Crosstimbers

### DESCRIPTION

The Jefferson County Grasslands Conservation Area encompasses a series of untilled prairie fragments in the Red River drainage of south-central Oklahoma. A mosaic of plant communities occur here, including mesquite shrublands, mid- and tallgrass prairies, crosstimbers woodland, and bottomland hardwood forests. This site was selected based on National Land Cover Data (NCLD 1992 and 2001) and satellite imagery, but currently few specifics about its biodiversity and conservation significance are known. Numerous historical records for prairie dog colonies exist for this area.

Threats likely include invasive species (eastern redcedar), improper herbicide use, and fire suppression.

## Keystone Woodlands

CA Type: Terrestrial  
Map #: NC05  
State: OK

Size: 499,837 acres (202,277 hectares)  
Stratification Unit: Northern Crossttimbers

### DESCRIPTION

The Keystone Woodlands Conservation Area lies northwest of Tulsa in Pawnee, Creek, Tulsa, and Osage counties. The dominant matrix ecological system is Crossttimbers Oak Forest and Woodland. Tallgrass prairie and oak savanna occur as large and small-patch communities within this matrix. Predictive modeling by Peppers (2004) indicates that there may be several significant remnants of old-growth forest scattered throughout this conservation area. Some old-growth is already protected (e.g., in Keystone Ancient Forest Preserve, Keystone State Park).

The Crossttimbers Oak Forest and Woodland ecological system includes plant communities dominated by oak - hickory (*Quercus* - *Carya*) forest. The canopy layer is dominated by post oak (*Quercus stellata*), black oak (*Quercus velutina*), black hickory (*Carya texana*), and blackjack oak (*Quercus marilandica*). On dry southwestern exposures, post oak and blackjack oak are canopy codominants, and few other woody species are present. These xeric forests are quite barren and have little understory plant cover. Fragrant sumac (*Rhus aromatica*) and farkleberry (*Vaccinium arboreum*) are typical understory shrubs. Herbaceous species include plantain-leaved pussytoes (*Antennaria plantaginifolia*) and poverty oat-grass (*Danthonia spicata*). On mesic slopes with a northern aspect, Shumard oak (*Quercus shumardii*) dominates the forest canopy. Other common trees are black hickory, Chinquapin oak (*Quercus muehlenbergii*), white ash (*Fraxinus americana*), and serviceberry (*Amelanchier arborea*). Here, the understory is slightly more developed than on the drier slopes. Indian woodoats (*Chasmanthium latifolium*) often forms dense clones. Other less common species include Jack-in-the-pulpit (*Arisaema triphyllum*), bluejacket (*Tradescantia ohioensis*), golden currant (*Ribes aureum*), and northern slender lady's tresses (*Spiranthes lacera*) (Roe 1998). The sedge, *Carex fissa* (G4?), and Oklahoma beardtongue (*Penstemon oklahomensis*, G3) are known to occur within the conservation area.

In addition to oak-hickory forest, riparian areas along creeks may include the silver maple - box elder (*Acer saccharinum* - *Acer negundo*) community type.

Forest structure and plant community composition are strongly influenced by the fire regime. Where fire has occurred more recently and/or more frequently, forest structure is more open with greater diversity and productivity in the understory. Eastern redcedar (*Juniperus virginiana*) may be a codominant in steep, rocky areas.

The most common woodland plant community is post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland. Prairies may occur within or amid savannas dominated by post oak and blackjack oak. Tallgrass prairies are dominated by big bluestem - little bluestem - yellow indiagrass (*Andropogon gerardii* - *Schizachyrium scoparium* - *Sorghastrum nutans*) associations. These fire-dependent communities have virtually disappeared from areas where fire has been excluded for several decades.

Prairie mole cricket (*Gryllotalpa major*, G3) occurs within the conservation area.

Development is perhaps the greatest threat in this conservation area, particularly north and west of the Tulsa Metropolitan Area. Fire exclusion is likely to become a greater threat over time, especially as parts of the area become more populated. As fire frequency declines, prairie and savanna communities will trend toward forest. This change will be most severe where eastern redcedar begins to invade grasslands, leading to dense, low-diversity plant communities.

## Keystone Woodlands (cont'd)

### DESCRIPTION

#### Literature Cited

Peppers, K. C. 2004. Old-Growth Forests in the Western Cross Timbers of Texas. Ph.D. Dissertation, Dept. of Biology, University of Arkansas, Fayetteville, AR. 171 pp.

Roe, S. A. 1998. The Vegetation of a Tract of Ancient Cross Timbers in Osage County, Oklahoma. MS. Thesis, Oklahoma State University, Stillwater, OK. 86 pp.

## Lake Eufala Old-Growth Crosstimbers

CA Type: Terrestrial  
Map #: NC16  
State: OK

Size: 367,346 acres (148,659 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Lake Eufala Tributaries

CA Type: Terrestrial  
Map #: NC17  
State: OK

Size: 474,911 acres (192,190 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Lexington WMA

CA Type: Terrestrial  
Map #: NC14  
State: OK

Size: 385,030 acres (155,816 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Lincoln/Logan Savannas

CA Type: Terrestrial  
Map #: NC11  
State: OK

Size: 459,875 acres (186,105 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Maud Wetland

CA Type: Terrestrial  
Map #: NC15  
State: OK

Size: 12,870 acres (5,208 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Mayes County Grasslands

CA Type: Terrestrial  
Map #: NC08  
State: OK

Size: 3,561 acres (1,441 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Mayes County Grasslands Conservation Area lies east of Tulsa in a region historically dominated by tallgrass prairie. The conservation area occurs at the intersection of Mayes, Rogers, and Wagoner counties. Tallgrass prairies are dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), yellow indiagrass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*). Prairies occur as inclusions within oak-hickory forest. Historically, much of the region was likely a mix of tallgrass prairie and oak savanna. Haying and grazing have maintained many of the native prairie remnants. This landscape is virtually entirely in private ownership.

The conservation area is especially important to grassland birds, including Le Conte's sparrow (*Ammodramus leconteii*, G4), Sprague's pipit (*Anthus spragueii*, G4), short-eared owl (*Asio flammeus*, G5), Smith's longspur (*Calcarius pictus*, G5), loggerhead shrike (*Lanius ludovicianus*, G4), and greater prairie chicken (*Tympanuchus cupido*, G4).

Development is the primary threat in the conservation area. Sizable tracts that have historically been used for ranching are being subdivided and converted to small "ranchettes" or developed for high density subdivisions. As the area becomes increasingly populated, the use of fire will continue to decline.

## McAlester

CA Type: Terrestrial  
Map #: NC25  
State: OK

Size: 44,442 acres (17,985 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## McClellan-Kerr WMA

CA Type: Terrestrial  
Map #: NC10  
State: OK

Size: 5,051 acres (2,044 hectares)  
Stratification Unit: Northern Crossttimbers

### DESCRIPTION

The McClellan-Kerr WMA Conservation Area is located in Wagoner, Muskogee, Haskell, and Sequoyah counties. Located along the McClellan-Kerr Navigation System, the area encompasses an extensive corridor of bottomland hardwood and riparian forest. The floodplain forest includes examples of pin oak - pecan / possum-haw (*Quercus palustris* - *Carya illinoensis* / *Ilex decidua*) forest. The area is characterized by stretches of forest with inclusions of cropland. Within the McClellan-Kerr Wildlife Management Area, approximately 1,000 acres are planted to row crops annually. Controlled burns are utilized to manage parts of the area. A 250-acre waterfowl refuge, near Braggs, is managed for waterfowl with a 100-acre wetland unit and fields planted with corn and soybeans annually. The common water-willow (*Justicia americana*) community type occurs within wetlands on the area.

Threats include alteration in natural flood regimes, fire exclusion, and conversion to agriculture.

## Pipewort Haven

CA Type: Terrestrial

Map #: NC30

State: OK

Size: 20,538 acres (8,311 hectares)

Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Stillwater Prairies

CA Type: Terrestrial  
Map #: WT01  
State: OK

Size: 621,331 acres (251,444 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers, Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Verdigris River/Horseshoe Lake

CA Type: Terrestrial

Map #: NC07

State: OK

Size: 10,060 acres (4,071 hectares)

Stratification Unit: Northern Crosstimbers

### DESCRIPTION

The Verdigris River/Horseshoe Lake Conservation Area is located east of Tulsa in Rogers County. The conservation area was selected for good quality examples of floodplain forest along the Verdigris River. The site is dominated by temporarily or seasonally flooded forest, with some areas of semi-permanently flooded forested wetlands. Several examples of forest, shrubland, and herbaceous communities associated with the riparian system target have been documented here. Most of the area is early and mid-successional oak - pecan - hackberry (*Quercus palustris* / *shumardii* - *Carya illinoensis* - *Celtis laevigata*) forest surrounding four large oxbow lakes with abundant aquatic and emergent vegetation (Brabander et al. 1985).

Although the Verdigris River has been channelized, Horseshoe Lake is considered to be a significant oxbow. Wetlands get runoff from surrounding uplands. Hydrological regime is good, with backwater from the Verdigris and periodic flooding into the forested floodplain (Brabander et al. 1985).

Threats include altered hydrological regimes, fragmentation, and invasive species.

#### Literature Cited

Brabander, J. J., R. E. Masters, and R. M. Short. 1985. Bottomland Hardwoods of Eastern Oklahoma. U.S. Fish and Wildlife Service, Tulsa, OK.

## Washita River Floodplain

CA Type: Terrestrial  
Map #: NC28  
State: OK

Size: 33,160 acres (13,419 hectares)  
Stratification Unit: Northern Crosstimbers

### DESCRIPTION

Description is currently unavailable.

## Watonga Wetlands

CA Type: Terrestrial

Map #: WT03

State: OK

Size: 73,134 acres (29,596 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Watonga Wetlands Conservation Area is located in the North Canadian River watershed of central Blaine County. Target elements include riparian plant communities found along tributary streams, and closed depression wetlands located near the river. The lentic wetlands may be used as stopover sites by migrating waterfowl, particularly during wet years (B. Hoagland, personal communication, 2008).

Row crop agriculture is the major landuse in this region. Threats include agricultural conversion, altered grazing regime, invasive species (*Tamarix* spp.), and oil and gas development.

## Wichita Mountains/Fort Sill

CA Type: Terrestrial  
Map #: WT05  
State: OK

Size: 490,689 acres (198,575 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Wichita Mountains/Fort Sill Conservation Area is located in Comanche, Kiowa, and Caddo counties. It includes the Wichita Mountains, Wichita Mountains Wildlife Refuge, and Fort Sill. The western portion of this conservation area has also been identified as a portfolio site (Wichita Mountains) within the Central Mixed-Grass Prairie ecoregional assessment, and is described therein as follows:

“The Wichita Mountains form a unique ecological system in southwestern Oklahoma. The ancient, rounded mountains consist mainly of granite, rhyolite, and other igneous rocks uplifted during the Cambrian Period. Several peaks reach over 2,400 feet over sea level, with relief of near 1,000 ft above the surrounding plains and valleys. Gentler slopes and valleys between the mountains have developed soils that support a mosaic of prairie and woodland communities, predominantly mixed-grass prairie interspersed with patches of post-oak blackjack oak forest. REA [Rapid Ecological Assessments] indicated that the dominant community type of this area is crosstimbers oak woodland system. A number of plant and animal species reach the western limit of their range here and “relict” populations of both eastern and western trees can be found scattered throughout the range. The 59,000 acre Wichita Mountains National Wildlife Refuge, established as a national forest in 1905, encompasses the greater part of the mountain system. Bison were reintroduced in 1910, followed by elk, and a small herd of Texas longhorn cattle. The refuge has an active prescribed fire program, and is one of the oldest continuously managed federal properties in the US. The mountains extend southeast over the the 94,000 acre Ft. Sill Military Reservation, and north and west across private lands. Scrub oak woodlands in the central part of the refuge are home to a thriving population of the endangered black-capped vireo [*Vireo atricapilla*, G2G3; one of only three remnant populations in Oklahoma and probably the most viable]. The Wichita Mountains proper are flanked on the northeast by the Slick Hills, a series of folding and steeply dipping limestones deposited subsequent to the formation of the granite mountains. The hills are vegetated by various mixed-grass prairie communities, with tallgrass and woodland associations occurring in the valleys. The area is composed mostly of large private ranches (Steuter et al. 2003).”

This conservation area is also known for the multiple prairie dog colonies present at Fort Sill and Wichita Mountains NWR.

Threats include altered fire regime, wind energy development, residential development, agricultural conversion, altered grazing regime, invasive species such as sericea lespedeza (*Lespedeza cuneata*), recreation, and mining (granite, limestone).

#### Literature Cited:

Steuter, A., J. S. Hall, and M. L. Khoury. 2003. Conserving the Biological Diversity of the Central Mixed-Grass Prairie: A Portfolio Designed for Conservation Action. The Nature Conservancy, Nebraska Field Office, Omaha, NE.

## Pecan Bayou

CA Type: Terrestrial  
Map #: PS01  
State: TX, OK

Size: 217,851 acres (88,161 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Pecan Bayou Conservation Area is located primarily in Red River County in Texas, but also extends into the southwestern portion of McCurtain County in Oklahoma. This conservation area includes the largest undammed watershed in northeast Texas; rare species such as the American burying beetle (*Nicrophorus americanus*, G2G3), Arkansas meadow-rue (*Thalictrum arkansanum*, G2Q), and southern lady's-slipper (*Cypripedium kentuckiense*, G3); at least one old-growth upland shortleaf pine - oak (*Pinus echinata* - *Quercus* spp.) forest; thousands of acres of mature bottomland hardwood forest; calcareous prairie; dry slope forest; and depressional wetlands. The area's diversity is attributable in part to its unusual geology. The geology is associated with plant communities which are oddities to east Texas, such as calcareous prairies on the Annona Chalk formation and calcareous slope forest on the Kiamichi formation. Plant taxa peripheral to Texas, but abundant in the Ouachita Mountains and further north and east, occur in this conservation area.

The Nature Conservancy had previously designed an embedded conservation area of 2,834 hectares associated with its Lennox Woods Preserve. The Lennox Woods Preserve includes a 148-ha old growth forest and a 392-ha tract containing mature bottomland hardwood forest within the lowlands and a loblolly pine (*Pinus taeda*) plantation on the uplands. These disjunct tracts are joined by Pecan Bayou. Protection of historic flood regimes is considered critical for the maintenance of bottomland forest and a number of the rare plant species occurring there. Effort is being undertaken to protect intervening tracts; the goal is to conserve hydrologic features and to provide a corridor for migration of species and genetic material.

The Nature Conservancy does not currently have locally based staff, but is a well known presence in the community. The Lennox Woods Preserve is an anchor within this conservation area, and it may serve as an incubator for development and demonstration of sustainable forestry and restoration technologies. For example, sustainable forestry techniques are being used within the loblolly pine plantation on the preserve. The management plan dictates that, on the final cut, each loblolly pine management unit will be planted to shortleaf pine, with an eye toward eventual restoration of shortleaf pine - oak forest.

Threats to the site and to the preserve are numerous. The key threat is the possible development of a reservoir on Pecan Bayou, which will radically alter historic flood regimes and negatively impact aquatic and riparian habitat in the area. Conversion of both bottomland and upland forest to pasture and pine plantation is a secondary threat. Native upland shortleaf pine - oak forest is becoming invaded by loblolly pine as these remnants are often surrounded by pine plantation.

Existing partners include the Martha, Bagby and David Lennox Foundation, the Texas Land Conservancy, the Texas Forest Service, and the Red River Chapter of the Master Naturalists. Notably, the Lennox Foundation donated the original Lennox Woods tract and continues to support conservation within the site. The Texas Land Conservancy has agreed to hold a conservation easement on part of this tract as Natural Resource Damage Assessment mitigation.

## Red River (East of Lake Texoma)

CA Type: Terrestrial  
Map #: NC32  
State: OK, TX

Size: 59,466 acres (24,065 hectares)

Stratification Unit: Northern Crosstimbers, Post Oak Savanna

### DESCRIPTION

The Red River (East of Lake Texoma) Conservation Area encompasses the numerous sand bars and islands found along both sides of the Red River downstream from Lake Texoma. This lower stretch of the Red River may currently be the best area for nesting interior least tern (*Sternula antillarum athalassos*, G4T2Q) populations (K. Stubbs, personal communication, 2007).

## Red River Floodplain

CA Type: Terrestrial  
Map #: WT07  
State: OK, TX

Size: 94,408 acres (38,205 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Red River Floodplain Conservation Area encompasses long stretches of fairly intact floodplain forest and numerous sand bars and islands along both sides of the Red River (from the eastern edge of Wilbarger County to the eastern edge of Montague County). The western boundary of this conservation area has been drawn to end at the 10-mile ecoregional buffer line for the purposes of this assessment, but in reality the floodplain extends much further upstream along the Red River. The continuously shifting sand bars and islands provide important nesting habitat for the interior least tern (*Sternula antillarum athalassos*, G4T2Q).

## Bastrop Lost Pines

CA Type: Terrestrial

Map #: PS13

State: TX

Size: 149,356 acres (60,442 hectares)

Stratification Unit: Post Oak Savanna, Southern Blackland Prairie

### DESCRIPTION

The Bastrop Lost Pines Conservation Area is located in northern Bastrop County, extending westward into the rural suburbs of Austin in east-central Travis County. As suggested by its name, this conservation area is focused on the stands of loblolly pine (*Pinus taeda*) that occur here in a “lost” fashion, disjunct from the species’ continuous range from East Texas to Florida. Other disjunct stands occur nearby in Caldwell, Fayette, and Colorado counties. In addition to pines, this conservation area incorporates an interesting cross-section of Eocene substrates, including quartz sands, glauconitic clays, greensands, and ironstones, as well as gravelly Pleistocene high terraces deposits associated with the Colorado River.

Two terrestrial ecological community types have been recognized from this conservation area: loblolly pine - post oak (*Pinus taeda* - *Quercus stellata*) Lost Pines forest / woodland and post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland. At the ecological system level, this vegetation could be regarded as representative of the Crosstimbers Southern Pine Forest and Woodland and the East-Central Texas Plains Post Oak Savanna and Woodland systems, respectively. Significant portions of these communities and systems are being conserved in the managed areas mentioned later in this description. A third system, West Gulf Coastal Plain Herbaceous Seepage Bog, is also present in the conservation area, but the current condition of examples within the area is uncertain at present. Most of the true bogs in this part of the ecoregion were mined for sphagnum during the World War II era and/or subsequently converted to stock tanks.

One of the more remarkable attributes of this conservation area is the largest known population of Houston toad (*Bufo houstonensis*, G1), a federally-listed endangered species that is endemic to southcentral Texas. Part of this population’s habitat is protected within Bastrop State Park. All other known populations of this species are on private land. Habitat loss and conversion, road mortality, and predation by red imported fire ants (*Solenopsis invicta*) pose significant threats to the few, small populations of this species that remain across its range. Another species of concern in the conservation area is the Comanche harvester ant (*Pogonomyrmex comanche*, GNR). Found in deep sand habitats, this species has become quite rare due to habitat loss, habitat alteration, and competitive displacement by red imported fire ants. The National Guard has a conservation program for the large and stable population that has been documented from Camp Swift Military Reservation (Cook 2003). Comprehensive invertebrate surveys of the Lost Pines, focusing on the stands in Bastrop County, have revealed a remarkable diversity of insects, some of which have extremely restricted ranges (Taber and Fleenor 2003). These insects are collectively referred to as the Lost Pines Insect Assemblage for this assessment.

Although the Carrizo, Queen City, and Sparta sands cross the eastern part of this conservation area, they are not known to support many of the plant species that are endemic to the ecoregion’s sandylands. Green beebalm (*Monarda viridissima*, G3) is represented by a few populations, including the one from which the new species was described in 1968.

Several managed areas lie within this site, including Camp Swift Military Reservation and multiple tracts managed by the Lower Colorado River Authority. Areas that have been purchased or set aside for conservation include Bastrop State Park (5,926 acres) and the adjacent Stengl Station (owned by University of Texas-Austin, 208 acres), Buescher State Park (1,017 acres, connected to Bastrop State Park by a scenic corridor), and the LCRA McKinney Roughs Nature Park (1,100 acres).

## Bastrop Lost Pines (cont'd)

### DESCRIPTION

#### Literature Cited

Cook, J. 2003. Conservation of Biodiversity in an Area Impacted by the Red Imported Fire Ant, *Solenopsis invicta* (Hymenoptera: Formicidae). *Biodiversity and Conservation* 12:187-195.

Taber, S. and S. Fleenor. 2003. *Insects of the Texas Lost Pines*. Texas A&M University Press, College Station.

## Bellville Prairie

CA Type: Terrestrial  
Map #: PS14  
State: TX

Size: 12,735 acres (5,154 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Bellville Prairie Conservation Area is located in Austin County, within the Fayette Prairie region of the Blackland Prairie. Surface geology consists of mostly sandy Pleistocene sediments of the Willis Formation in the western part and of the Lissie Formation to the east. Uplands support a mix of post oak woodlands and midgrass prairies, while the area's Mill Creek bottomland supports deciduous riparian woodlands and tallgrass prairies.

The deciduous riparian woodlands along Mill Creek can be characterized as water oak - (white oak, willow oak) (*Quercus nigra* - *Quercus (alba, phellos)*) forest. The conservation area itself is named for a tallgrass prairie remnant in the Mill Creek floodplain. Approximately 800 acres in size, Bellville Prairie is considered to be the largest known occurrence of eastern gammagrass - switchgrass - yellow indiagrass - Michaelmas-daisy (*Tripsacum dactyloides* - *Panicum virgatum* - *Sorghastrum nutans* - *Helianthus maximiliani*, G1) herbaceous vegetation in Texas. This prairie is dominated by the tall eastern bottomland variant of eastern gammagrass (*Tripsacum dactyloides*), with buffalograss (*Buchloe dactyloides*) occurring in the interstices (F. Smeins, personal communication, 2008). The current ownership status of this remnant prairie is unknown; until the last decade, it was under single ownership.

This conservation area appears to be entirely under private ownership. There are no formally protected sites known to exist within Bellville Prairie CA.

The primary threats to targets within this conservation area are conversion of native prairie to row-crop agriculture and impoundment for flood prevention.

## Bexar Invertebrate Cave Complex 1

CA Type: Terrestrial  
Map #: SB06  
State: TX

Size: 64 acres (26 hectares)

Stratification Unit: Southern Blackland Prairie

### DESCRIPTION

The Bexar Invertebrate Cave Complex 1 Conservation Area, located in Bexar County, represents one of three critical habitat units designated by the U.S. Fish and Wildlife Service for the new unnamed *Rhadine infernalis* (ground beetle, G1G2T1T2<sup>1</sup>) subspecies. The species appears to be endemic to Bexar County, and the range of this subspecies may be restricted to the portion of Bexar County found within the Crosstimbers and Southern Tallgrass Prairie Ecoregion. Both the species and subspecies are federally listed as endangered. Comprised of privately owned lands that are currently undeveloped, this conservation area contains three caves where the subspecies is known to occur: Game Pasture Cave No. 1, King Toad Cave, and Stevens Ranch Trash Hole Cave (U.S. Fish and Wildlife Service 2003).

<sup>1</sup>This subspecies is not currently recognized by NatureServe. The GRANK used in this description is based on the assumption that this currently unnamed subspecies will eventually receive the same (or similar) ranking as the other two named subspecies (*Rhadine infernalis ewersi* and *Rhadine infernalis infernalis*).

#### Literature Cited

U.S. Fish and Wildlife Service. 2003. U.S. Fish and Wildlife Service. Part II: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Seven Bexar County, Texas, Invertebrate Species; Final Rule. (50 CFR Part 17). Federal Register 68 (67): 17156-17231.

## Bexar Invertebrate Cave Complex 2

CA Type: Terrestrial  
Map #: SB07  
State: TX

Size: 85 acres (34 hectares)

Stratification Unit: Southern Blackland Prairie

### DESCRIPTION

The Bexar Invertebrate Cave Complex 2 Conservation Area, located in Bexar County, represents one of three critical habitat units designated for the new unnamed *Rhadine infernalis* (ground beetle, G1G2T1T2<sup>1</sup>) subspecies and the only critical habitat unit designated by the U.S. Fish and Wildlife Service for *Cicurina venii* (Veni's cave spider; a.k.a. Braken Bat Cave meshweaver, G1G2). Both of these invertebrates are federally listed as endangered. Comprised of privately owned residential lands, this conservation area contains four caves. The new unnamed subspecies of *Rhadine infernalis* has been documented from three of those caves: Isopit, Obvious Little Cave, and Wurzbach Bat Cave. The species appears to be endemic to Bexar County, and the range of this subspecies may be restricted to the portion of Bexar County found within the Crosstimbers and Southern Tallgrass Prairie Ecoregion. *Cicurina venii* was found in Braken Bat Cave, currently the only known location for this species in the world (U.S. Fish and Wildlife Service 2003). Unfortunately, the entrance to this cave was filled in 1990 during residential construction, so the last positive identification of this species is from 1983. While no confirmation of the species' persistence exists, a small side passage that remains open may provide sufficient nutrients to allow the species to survive (U.S. Fish and Wildlife Service 2000).

<sup>1</sup>This subspecies is not currently recognized by NatureServe. The GRANK used in this description is based on the assumption that this currently unnamed subspecies will eventually receive the same (or similar) ranking as the other two named subspecies (*Rhadine infernalis ewersi* and *Rhadine infernalis infernalis*).

#### Literature Cited

- U.S. Fish and Wildlife Service. 2000. Endangered and Threatened Wildlife and Plants; Final Rule to List Nine Bexar County, Texas Invertebrate Species as Endangered. (50 CFR Part 17). Federal Register 65 (248): 81419-81433.
- U.S. Fish and Wildlife Service. 2003. U.S. Fish and Wildlife Service. Part II: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Seven Bexar County, Texas, Invertebrate Species; Final Rule. (50 CFR Part 17). Federal Register 68 (67): 17156-17231.

## Bosque Prairies and Woodlands

CA Type: Terrestrial  
Map #: ST06  
State: TX

Size: 153,300 acres (62,038 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers

### DESCRIPTION

The Bosque Prairies and Woodlands Conservation Area is located in Bosque County, east of Meridian and between the Bosque and Brazos rivers. This area on the Lampasas Cut Plain was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001), but detailed information about its potential biodiversity significance is currently lacking. The landscape is characterized by highly dissected plains on Lower Cretaceous limestone. Soils are generally comprised of the shallow to very shallow Eckrant-Brackett-Cranfill association (Lithic Haplustolls and Ustochrepts). Topography is rolling to relatively angular in landform. Uplands are expected to be dominated by Southeastern Great Plains Tallgrass Prairie, but Edwards Plateau Dry-Mesic Slope Forest and Woodland may be typical on slopes. Edwards Plateau Limestone Savanna and Woodland could also be present as small patches on upper slopes and ridges. Both the golden-cheeked warbler (*Dendroica chrysoparia*, G2) and the black-capped vireo (*Vireo atricapilla*, G2G3) were seen during surveys from the 1990s in the vicinity of Lake Whitney, but there is no current information to indicate that viable breeding populations exist in the area.

The eastern edge of this conservation area borders Lake Whitney, a flood control reservoir on the Brazos River. The U.S. Army Corps of Engineers maintains the dam and the surrounding parks, some of which are included within this CA. The rest of the conservation area appears to be under private ownership.

The predominant land use in the Bosque Prairies and Woodlands Conservation Area appears to be cattle ranching. Row crop cultivation, though present, has never been widespread in this area because of the thin soils and topography. The threat from urbanization is probably lower in this conservation area as compared to conservation areas to the north. However, it is likely that subdivision of larger holdings for hunting properties occurs. Part of this area is being explored for development of the Barnett Shale gas field.

## Burleson

CA Type: Terrestrial  
Map #: PS11  
State: TX

Size: 3,088 acres (1,250 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Burleson Conservation Area is situated northeast of Caldwell in Burleson County. This site was chosen because a viable population of the Houston toad (*Bufo houstonensis*, G1), a federally-listed endangered species, is known to occur there. While there is little additional information available about the area, the surface geology (Sparta Sand) is appropriate for many Texas endemic plant species, including several species of conservation interest. Seepage bogs have been mapped in this area by the Texas Parks and Wildlife Department (J. Singhurst, personal communication, 2008).

This conservation area appears to be entirely under private ownership. There are no formally protected sites known to exist within the Burleson Conservation Area.

## Caddo National Grasslands-Bois d'Arc Creek

CA Type: Terrestrial  
Map #: NC33  
State: TX

Size: 207,210 acres (83,855 hectares)

Stratification Unit: Northern Crosstimbers, Northern Blackland Prairie

### DESCRIPTION

The Caddo National Grasslands-Bois d'Arc Conservation Area, located in Fannin and Lamar counties, is named after the 13,360-acre<sup>1</sup> Bois d'Arc Creek Unit of the Caddo National Grasslands WMA. The National Grasslands were acquired by the federal government during the Great Depression of the 1930s to protect and rehabilitate highly erodible lands. As this involved the purchase of individual farms, the Caddo National Grasslands are composed of a number of fragmented patches ranging from tens to hundreds of acres in size within a matrix of private ownership. The Conservation Corps seeded many of the lands to native grasses and forbs; as a result, many of these patches have greater diversity than the surrounding sites. Administered by the U.S. Forest Service, the Caddo National Grasslands WMA is managed under a cooperative agreement with the Texas Parks and Wildlife Department (TPWD). Bonham State Park, managed by TPWD, is also found in this conservation area.

The Caddo National Grasslands-Bois d'Arc Conservation Area has variable geology which supports a variety of plant communities. Both Red River alluvium and Austin Chalk are found in this conservation area. Communities typical of the East-Central Texas Plains Post Oak and Savanna matrix system, such as post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G<sub>4</sub>) woodland, are common on sandier soils. Scattered remnant prairies occur as small-scale patches within that matrix. The prairies are generally either little bluestem - yellow indiagrass - prairie bishop Alfisol (*Schizachyrium scoparium* - *Sorghastrum nutans* - *Bifora americana*, G<sub>1</sub>G<sub>2</sub>) or Silveus' dropseed - longspike tridens (*Sporobolus silveanus* - *Tridens strictus*, G<sub>2</sub>) herbaceous vegetation types. There is one known occurrence of wide-leaf false aloe (*Manfreda virginica* ssp. *lata*, G<sub>5</sub>T<sub>1</sub>T<sub>2</sub>Q<sub>2</sub>) in a prairie remnant. Bur oak - chinquapin oak - Shumard oak (*Quercus macrocarpa* - *Quercus muehlenbergii* - *Quercus shumardii*) forest occurs on slopes of the chalk formations, and small patches of calcareous woodlands (e.g., Texas oak - Texas ash - white shin oak - chinquapin oak (*Quercus buckleyi* - *Fraxinus texensis* - *Quercus sinuata* var. *breviloba* - *Quercus muehlenbergii*)) are found on Eagle Ford Shale and Goodland limestone formations; these are community types which are range-restricted in Texas and not well represented in conservation management. The riparian forest present along Bois d'Arc Creek is considered relatively unfragmented in comparison to riparian areas along most small streams in North Texas. Based on a very limited sample, it appears that the riparian forest is of the relatively common sugarberry - green ash (*Celtis laevigata* - *Fraxinus pennsylvanica*) type.

U.S. Forest Service staff have reintroduced fire in the Caddo National Grasslands and performed some mechanical clearing to reinstate savanna vegetation patterns. Restoration efforts are focused on those areas with prairie forbs and grasses within otherwise thicketized areas. The Bois d'Arc Unit faces less threat from fragmentation than the Ladonia Unit of the Caddo National Grasslands. The current threat of greatest concern in this area is the development of a reservoir on Bois d'Arc Creek. The reservoir will have a direct impact on aquatic communities and riparian forest associated with Bois d'Arc Creek, and may affect the grasslands as well, directly or indirectly. Although the American burying beetle (*Nicrophorus americanus*, G<sub>2</sub>G<sub>3</sub>), a federally-listed species, has not been documented at this site, there is suitable habitat in the flatwoods within the Bois D'Arc Unit (T. Philipps, personal communication, 2008); this species could also potentially be impacted (if present) by the proposed reservoir development.

<sup>1</sup> The acreage listed for the Bois d'Arc Creek Unit (13,360 acres) comes from a description of the Caddo National Grasslands on the TPWD website: [http://www.tpwd.state.tx.us/huntwild/hunt/wma/find\\_a\\_wma/list/?id=4](http://www.tpwd.state.tx.us/huntwild/hunt/wma/find_a_wma/list/?id=4).

## Caddo National Grasslands-Bois d'Arc Creek (cont'd)

### DESCRIPTION

<sup>2</sup> This subspecies is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Caddo National Grasslands-Ladonia

CA Type: Terrestrial  
Map #: NB01  
State: TX

Size: 26,397 acres (10,682 hectares)

Stratification Unit: Northern Blackland Prairie

### DESCRIPTION

The Caddo National Grasslands-Ladonia Conservation Area, located in Fannin and Hunt counties, is named after the 2,780-acre<sup>1</sup> Ladonia Unit of the Caddo National Grasslands WMA. The National Grasslands were acquired by the federal government during the Great Depression of the 1930s to protect and rehabilitate highly erodible lands. As this involved the purchase of individual farms, the Caddo National Grasslands are composed of a number of fragmented patches ranging from tens to hundreds of acres in size within a matrix of private ownership. The Conservation Corps seeded many of the lands to native grasses and forbs; as a result, many patches have greater diversity than the surrounding sites. Furthermore, there is at least one native prairie remnant protected within the Ladonia Unit. Administered by the U.S. Forest Service, the Caddo National Grasslands WMA is managed under a cooperative agreement with Texas Parks and Wildlife.

The U.S. Forest Service has allowed grazing and public hunting on the Ladonia Unit for many years. During the past decade, grazing practices have become more regulated and fire management has become more commonplace in the Caddo National Grasslands. The Nature Conservancy has recently agreed to provide native seed for the U.S. Forest Service's prairie restoration efforts in the Ladonia Unit. The Ladonia Unit is within 30 miles of The Nature Conservancy's Clymer Meadow Preserve, and some potential for connection may exist in the future. A Rails-to-Trails program has proposed the connection of Celeste (near the Clymer Meadow Preserve) to Paris, Texas, which may provide corridor construction opportunities between the two projects.

Key threats to this conservation area include subdivision of larger tracts and associated development which would further isolate the native grassland patches. The U.S. Forest Service has attempted to purchase intervening lands to consolidate their holdings. It does not appear that these efforts have been successful to date.

<sup>1</sup>The acreage listed for the Ladonia Unit (2,780 acres) comes from a description of the Caddo National Grasslands on the TPWD website: [http://www.tpwd.state.tx.us/huntwild/hunt/wma/find\\_a\\_wma/list/?id=4](http://www.tpwd.state.tx.us/huntwild/hunt/wma/find_a_wma/list/?id=4).

## Camp Maxey/Pat Mayse

CA Type: Terrestrial  
Map #: NC34  
State: TX

Size: 150,360 acres (60,849 hectares)

Stratification Unit: Northern Crosstimbers, Post Oak Savanna, Northern Blackland Prairie

### DESCRIPTION

The Camp Maxey/Pat Mayse Conservation Area is located just south of the Red River in Lamar and Fannin counties. The conservation area is named after the federally and state-owned lands centered around Pat Mayse Lake. Camp Maxey is an Army National Guard training facility, and Texas Parks and Wildlife Department owns and manages Pat Mayse State Park and Pat Mayse WMA. Maintained by the U.S. Army Corp of Engineers, Pat Mayse Lake is a 5,940-acre reservoir fed by Sanders Creek, a tributary of the Red River.

This conservation area supports a variety of plant communities, primarily those representative of the East-Central Texas Plains Post Oak Savanna and Woodland system on the uplands. While the creation of Pat Mayse inundated some stretches of riparian forest along Sanders Creek, there are still significant belts of riparian forest remaining in the area, as well as along Pine Creek. The eastern portion of the site grades into forest typical of upland sites in East Texas (Upper West Gulf Coastal Plain), with southern red oak (*Quercus falcata*) and mockernut hickory (*Carya alba*) as common elements. There are also inclusions of post oak - chinquapin oak (*Quercus stellata* - *Quercus muehlenbergii*) forest on upland sites. At least small portions of the eastern side of the site support forest with closed depressional wetlands. These wetlands form within the interstices of pimple mounds. This unique pattern appears to be restricted to eastern counties along the Red River in both Oklahoma and Texas. At least one privately owned remnant of Silveus' dropseed - longspike tridens (*Sporobolus silveanus* - *Tridens strictus*, G2) prairie is known from the southern portion of the conservation area, and there are likely to be other examples. The conservation area is also known for a viable occurrence of the federally-listed endangered American burying beetle (*Nicrophorus americanus*, G2G3) on Camp Maxey. Fire management has been implemented by Texas Parks and Wildlife Department on their lands within the last decade.

The current primary threat to conservation targets is ranchette development, particularly along the eastern edge of the conservation area. The population is generally increasing as nearby Paris expands and "Dallasites" seek the refuge of the countryside.

## Caracol Creek Coon Cave

CA Type: Terrestrial  
Map #: SB08  
State: TX

Size: 40 acres (16 hectares)

Stratification Unit: Southern Blackland Prairie

### DESCRIPTION

The Caracol Creek Coon Cave Conservation Area, located in Bexar County, is named for the cave found within the site. This conservation area represents one of three critical habitat units designated by the U.S. Fish and Wildlife Service for the new unnamed *Rhadine infernalis* (ground beetle, G1G2T1T2<sup>1</sup>) subspecies. The species appears to be endemic to Bexar County, and the range of this subspecies may be restricted to the portion of Bexar County found within the Crosstimbers and Southern Tallgrass Prairie Ecoregion. Both the species and subspecies are federally listed as endangered. This conservation area is comprised of several large privately owned tracts that are undeveloped. Loop 1604, a major highway, runs through the eastern portion of this conservation area and above part of the cave's subsurface drainage area (U.S. Fish and Wildlife Service 2003).

<sup>1</sup>This subspecies is not currently recognized by NatureServe. The GRANK used in this description is based on the assumption that this currently unnamed subspecies will eventually receive the same (or similar) ranking as the other two subspecies (*Rhadine infernalis ewersi* and *Rhadine infernalis infernalis*).

#### Literature Cited:

U.S. Fish and Wildlife Service. 2003. U.S. Fish and Wildlife Service. Part II: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Seven Bexar County, Texas, Invertebrate Species; Final Rule. (50 CFR Part 17). Federal Register 68 (67): 17156-17231.

## Carrizo Sands-Northwestern Segment

CA Type: Terrestrial  
Map #: PS15  
State: TX

Size: 102,884 acres (41,636 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Carrizo Sands-Northwestern Segment Conservation Area lies on gently rolling topography underlain by the Carrizo Sand and adjacent Eocene formations in eastern Caldwell, southern Bastrop, and northern Gonzalez counties, roughly from the Colorado River south to the San Marcos River. These sands support good examples of the East-Central Texas Plains Post Oak Savanna and Woodland and the East-Central Texas Plains Xeric Sandhill systems. Several plant species of conservation interest have been reported from this area's sandhill habitats and open roadsides, though the viability of these are currently unknown. Sandhill woolly-white (*Hymenopappus carrizoanus*, G2), an ecoregional endemic, is represented by two known populations. Hairy rhododon or Texas sandmint (*Rhododon ciliatus*, G3), another ecoregional endemic, has been seen in the past on the area's deep sands. At least one population of Shinners' sunflower (*Helianthus occidentalis* ssp. *plantagineus*, G5T2T3), a sandy prairie species largely confined to ungrazed roadsides, is found within this conservation area.

This conservation area appears to be entirely under private ownership. The area is fairly fragmented, and there are no known formally protected sites.

## Carrizo Sands-Southwestern Segment

CA Type: Terrestrial

Map #: PS17

State: TX

Size: 726,151 acres (293,863 hectares)

Stratification Unit: Post Oak Savanna, Southern Blackland Prairie

### DESCRIPTION

The Carrizo Sands-Southwestern Segment Conservation Area lies south and east of San Antonio, from the southeastern corner of Medina County and the northern edge of Atascosa County northeastward into southern Guadalupe and northern Gonzales counties. As the name suggests, it is underlain by Eocene sands of the Carrizo and other formations. Matrix vegetation in this gently rolling area is a savanna-like evergreen/deciduous woodland of post oak, live oak, and a few other trees intermixed with patches of midgrass grassland dominated by little bluestem. Sandhills, dunelike to hummocky to almost flat areas of deep, loose, excessively drained sand, are well developed in this conservation area, particularly on the Carrizo Sand south of Luling and south to southeast of Seguin (there are also relatively large land holdings in that area of 100s or 1,000s of acres). These small sites typically support a diverse assemblage of herbaceous species that includes more than a dozen common Texas endemics, such as rattlesnake flower (*Brazoria truncata* var. *truncata*), bristleless lestdaisy (*Chaetopappa imberbis*), Rio Grande tickseed (*Coreopsis nuecenoides*), Texas hiddenflower (*Cryptantha texana*), hoary milkpea (*Galactia canescens*), Park's beeblossom (*Gaura villosa* ssp. *parksii*), Runyon's sunflower (*Helianthus praecox* ssp. *runyonii*), bigflower bladderpod (*Lesquerella grandiflora*), pinkscale blazing star (*Liatris elegans* var. *carizzana*), showy palafoxia (*Palafoxia hookeriana*), woolly globemallow (*Sphaeralcea lindheimeri*), Lindheimer's hoarypea (*Tephrosia lindheimeri*), showy nerve-ray (*Tetragonatheca repanda*), and Texasgrass (*Vaseyochloa multinervosa*).

From the plant species perspective, East-Central Texas Plains Xeric Sandhill is one of the ecoregion's most important systems, and it is fairly well represented in this conservation area. Terrestrial ecological communities that have been identified within this conservation area include post oak - blackjack oak - black hickory - (Shumard oak, black oak) (*Quercus stellata* - *Quercus marilandica* - *Carya texana* - (*Quercus shumardii* - *Quercus velutina*), G3G5) forest and post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland.

This conservation area is a bona fide hotspot from the botanical perspective. Its sandhill environments harbor substantial populations of three conservation target species that are ecoregional endemics (or essentially so): sandhill woolly-white (*Hymenopappus carrizoanus*, G2), Parks' jointweed (*Polygonella parksii*, G2), and Elmendorf's onion (*Allium elmendorffii*, G2), named for a village within the site. Several other target species are also found on sandy uplands within the area: green beebalm (*Monarda viridissima*, G3), peachbush (*Prunus texana*, G3), and crown coreopsis (*Coreopsis nuecensis*, G4). Two additional G3 targets, Texas pinkroot (*Spigelia texana*)<sup>1</sup> and Texas tauschia (*Tauschia texana*), have been found in riparian woodlands along the area's streams.

Most of the conservation targets in this area have received little formal protection. Palmetto State Park (266 acres) includes forested swamps along the San Marcos River, but does not include examples of the bog communities it was originally set aside to protect. These sphagnum bogs, known as the Soefje wetlands, are privately owned and lie to the west of the park (Taber and Fleenor 2005). The bogs, along with the forested swamps within the state park, are considered part of the Ottine wetlands of Central Texas. The only known population of the palmetto pillsnail (*Euchemotrema leai cheatumi*, G5T1) is found within this park. Neasloney WMA is a small (99 acres) remnant of post oak - blackjack oak / little bluestem woodland.

<sup>1</sup> *Spigelia texana* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Carrizo Sands-Southwestern Segment (cont'd)

### DESCRIPTION

#### Literature Cited

Taber, S. W. and S. B. Fleenor. 2005. Invertebrates of Central Texas Wetlands. Texas Tech University Press, Texas.

## Cedar Creek

CA Type: Terrestrial  
Map #: PS06  
State: TX

Size: 10,728 acres (4,341 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Cedar Creek Conservation Area is located primarily within southeast Kaufman County. This area was identified using National Land Cover Data (NLCD 1992 and 2001), satellite imagery, and soils information, but detailed information about its potential biodiversity significance is lacking. The site contains a relatively large and contiguous stretch of riparian forest along Cedar Creek. Typical soils are clayey alluvia of the Aufco series, and support a Clayey Bottomland ecological site. Cedar Creek drains into Cedar Creek Reservoir.

This conservation area appears to be entirely under private ownership. There are no formally protected sites known to exist within Cedar Creek CA.

## Clymer Meadow

CA Type: Terrestrial  
Map #: NB02  
State: TX

Size: 17,525 acres (7,092 hectares)

Stratification Unit: Northern Blackland Prairie

### DESCRIPTION

The Clymer Meadow Conservation Area is located approximately 50 miles northeast of Dallas, Texas, in Hunt and Collin counties. It is sited on the Taylor marl formation characteristic of much of the Blackland Prairie east of the Austin Chalk formation. The soils are almost uniformly vertisols, and undisturbed lands exhibit characteristic gilgai microtopography. Although the matrix of the area is old field, improved pasture, and cropland, the conservation area supports four prairie remnants of the little bluestem - yellow indiagrass - big bluestem - prairie bishop Vertisol (*Schizachyrium scoparium* - *Sorghastrum nutans* - *Andropogon gerardii* - *Bifora americana*, G1G2) and eastern gammagrass - switchgrass - yellow indiagrass - Michaelmas-daisy (*Tripsacum dactyloides* - *Panicum virgatum* - *Sorghastrum nutans* - *Helianthus maximiliani*, G1) herbaceous vegetation types. Two of these (non-contiguous) prairie remnants are considered part of The Nature Conservancy's Clymer Meadow Preserve (1,375 acres). Clymer Meadow Preserve is known for representing the largest formally protected examples of the two prairie types. In addition to viable prairie community occurrences, the rare Parkhill Prairie crayfish (*Procambarus steigmani*, G1G2) and two uncommon plant species -- Topeka purple-coneflower (*Echinacea atrorubens*, G3) and wide-leaf false aloe (*Manfreda virginica* ssp. *lata*, G5T1T2Q<sup>1</sup>) -- have been documented from Clymer Meadow Preserve. Two additional prairie remnants in the area have been formally protected: approximately 20 acres in County Line Prairie (a 40-acre property owned by The Nature Conservancy) and 52 acres in Parkhill Prairie (a 436-acre property owned by Collin County). Parkhill Prairie is also significant as the site where the Parkhill Prairie crayfish was first discovered.

The key threats to the conservation area are subdivision and development. Secondary threats include inappropriate agricultural practices and infrastructure development, including the potential alignment of the Trans-Texas Corridor. Through restoration and private landowner agreements, it may be possible to substantially increase patch size and reduce fragmentation via restoration corridors.

The Clymer Meadow Conservation Area is home to a staffed community-based conservation program run by The Nature Conservancy. Programmatic emphasis has been placed on restoration, development of restoration technologies, and sustainable agriculture. Partners have included The American Farmland Trust, the Connemara Conservancy, Texas Land Conservancy, Texas A&M University-Commerce, and the University of North Texas.

<sup>1</sup> *Manfreda virginica* ssp. *lata* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Cooke County Grasslands

CA Type: Terrestrial  
Map #: WT13  
State: TX

Size: 112,069 acres (45,353 hectares)

Stratification Unit: Western Tallgrass and Crossttimbers

### DESCRIPTION

The Cooke County Grasslands Conservation Area lies northwest of Denton and south of Gainesville. The Cooke County Grasslands contain a substantial area of the Grand Prairie and small inclusions of the Western Crossttimbers on the conservation area's western border. Though the status of the Grand Prairie is not known with any precision, it may now occupy just 3-5 percent of its former range. This conservation area is thought to support some of the largest remaining examples of the little bluestem - big bluestem - yellow indiagrass - prairie bishop (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans* - *Bifora americana*) prairie types. Because of rocky, shallow soils, cattle ranching has been the primary landuse on the Grand Prairie, with row crop agriculture playing a secondary role. As a result, more native grassland has been left relatively intact than in the nearby Blackland Prairie. This irregularly shaped conservation area encompasses rolling uplands with some of the larger tracts of tall grassland left in North Texas; virtually the entire area is privately owned. Tract size here is generally in the 1000 to several 1,000s acre range, with a few scattered contiguous blocks of native prairie ranging from 1,000-5,000 acres. Although a substantial portion is a grazing disclimax (dominated by early to mid-successional native forbs and grasses), it may be feasible to restore many of these lands through judicious grazing and the reintroduction of fire. Prairie in good to excellent condition within this region supports an abundance of the tallgrasses, especially big bluestem and yellow indiagrass.

In addition to the prairie occurrences, post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodlands occur on the sandstone country to the west, and Chinquapin oak - bur oak (*Quercus muehlenbergii* - *Quercus macrocarpa*) slope forests occur on steep limestone topography in the central and eastern portions of the conservation area.

The Dixon Water Foundation owns and manages two properties in the conservation area, the Pittman Ranch (800 acres) and Leo Ranch (930 acres), to demonstrate compatability of grazing management with conservation of water and prairie vegetation. The Pittman Ranch is dominated by little bluestem - big bluestem - yellow indiagrass - prairie bishop grassland. The Leo Ranch contains occurrences of prairie and Chinquapin oak - bur oak forest on slopes. At the northern end of the conservation area, Tom Meador and his family own more than 1,500 acres of predominately unplowed little bluestem - big bluestem - yellow indiagrass grassland. The Meador lands have been utilized for hay production for many years.

An inventory conducted by Brian Rowe in 2007 for the Native Prairies Association of Texas (NPAT) found 6-7 prairie remnants within this area, concentrated in two clusters around the Meador properties and the Pittman Ranch.

Subdivision of larger tracts and development comprise the primary threats. The nearby city of Denton grew only 21% in the 10 years between 1990 and 2000, while Denton County grew 58% in the same period. Between 2000 and 2003 the county grew by 18%. The general indication is that the increased growth is, at least in part, within the rural portions of the county. While many ranch holdings are currently in the thousands of acres, the trend is toward ranchette subdivision. Much of the conservation area is underlain by the Barnett Shale formation, which is rich in natural gas but requires intensive extraction methods. Although alternative directional drilling methods are possible, many development companies are placing one well per 20 acres—the limit placed by the State.

## Cooke County Grasslands (cont'd)

### DESCRIPTION

This method, referred to by some as “carpet bombing,” represents a footprint of up to 5 acres for the well, and more disturbance associated with road development. Key conservation strategies should include promotion of conservation residential development and sustainable energy development.

## Crawford Bushlands

CA Type: Terrestrial  
Map #: ST07  
State: TX

Size: 118,852 acres (48,098 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers

### DESCRIPTION

The Crawford Bushlands Conservation Area is located primarily in southeastern Bosque County. The site is underlain primarily by lower Cretaceous limestone supporting extremely shallow soils, typically Lithic Calciustols and Lithic Ustorthents. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery, but detailed information about its potential biodiversity significance is lacking. A number of small patches of little bluestem - big bluestem - yellow indiagrass (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans*, G3?)<sup>1</sup> calcareous prairie occur here.

<sup>1</sup>This is a new proposed association, not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Jim Eidson (The Nature Conservancy).

## DeWitt County Crosstimbers

CA Type: Terrestrial  
Map #: PS21  
State: TX

Size: 140,354 acres (56,799 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The DeWitt County Crosstimbers Conservation Area is located in eastern DeWitt and southern Lavaca counties. This conservation area lies on level to gently undulating topography underlain by fine sandy sediments of the Willis Formation and, in the north, the Goliad Formation. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery, and appears to contain relatively intact and large expanses of East-Central Texas Plains Post Oak Savanna and Woodland. No surveys have been conducted in this area, and detailed information about its biodiversity significance is currently unavailable.

## Dogwood Cuesta

CA Type: Terrestrial

Map #: SB01

State: TX

Size: 32,181 acres (13,023 hectares)

Stratification Unit: Southern Blackland Prairie

### DESCRIPTION

The Dogwood Cuesta Conservation Area is situated in southwestern Dallas County, generally south of Interstate 20 and east of Joe Pool Lake. The primary feature here is the Austin Chalk Cuesta, a limestone outcrop of Upper Cretaceous origin. Southwestern Dallas County possesses the greatest exposure of the Cuesta, which runs from the Red River to south Texas. Elevation here is between 700 and 800 feet above sea level. Slopes can exceed 20%. Limestone glade communities are typical and are underlain by Eddy-Whitewright complex soils--Entisols made up of Austin Chalk residuum. In general, these xeric, thin-soiled sites support edaphic climax plant communities resembling Edwards Plateau vegetation. Edwards Plateau Dry-Mesic Slope Forest and Woodland is considered to be the dominant ecological system type present in the area. The predominant community types are Buckley oak - Texas ash - chinquapin oak (*Quercus buckleyi* - *Fraxinus texensis* - *Quercus muehlenbergii*, G2G3) forest, and post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland, interspersed with limestone glades. Ashe juniper and eastern redcedar are common components of the forest community. The conservation area also supports small patch occurrences of the little bluestem - big bluestem - yellow indiagrass - prairie bishop (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans* - *Bifora americana*, G1G2) Mollisol vegetation type. Glass Mountain coralroot (*Hexalectris nitida*, G3) and purple-spike coralroot (*Hexalectris warnockii*, G2G3) occur within the understory of juniper-dominated patches. Plateau milkvine (*Matelea edwardsensis*, G3) occurs within the Penn Prairie of Cedar Hill State Park. Historically, black-capped vireo (*Vireo atricapilla*, G2G3) nested within the conservation area, but it's unclear whether there is a viable nesting population there currently.

Primary threats include subdivision of large tracts, high density residential development, and invasion of exotic plants. Pressure is particularly acute on the northern and eastern boundaries of the conservation area. Primary conservation partners within the site are the Audubon Society, Texas Parks and Wildlife Department, and the U.S. Army Corps of Engineers. The Dallas Audubon Society leases and operates the 600-acre Cedar Ridge Preserve, and Audubon Texas owns and operates the nearby 270-acre Dogwood Canyon Audubon Center; Texas Parks and Wildlife owns and manages the 1,826-acre Cedar Hill State Park; Dallas County has the 290-acre Escarpment Preserve; and the U.S. Army Corps of Engineers manages the shoreline and various lands surrounding Joe Poole Lake.

## Dyksterhuis Woodlands and Prairies

CA Type: Terrestrial  
Map #: WT18  
State: TX

Size: 56,497 acres (22,864 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Dyksterhuis Woodlands and Prairies Conservation Area, located in eastern Parker and western Tarrant counties, is similar in many respects to its southern neighbor, the Fort Worth Prairies Conservation area. However, Crosstimber woodlands appear to be more prevalent in the former conservation area than in the latter. Soils are based on Lower Cretaceous limestone and tend toward Lithic Haplustolls, Pachic Argiustolls, and Typic Calcistolls of the Aledo, Bolar, and Venus series. This site supports a variety of conservation elements, including the Comanche harvester ant (*Pogonomyrmex comanche*, GNR), colonial waterbird nesting sites, post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland, little bluestem - big bluestem - yellow indiagrass (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans*, G3?<sup>1</sup>) calcareous prairie, and Comanche Peak prairie-clover (*Dalea reverchonii*, G2). Limestone glades support edaphic climax communities which are populated by a number of specialist, and sometimes endemic, plants. Comanche Peak prairie-clover is associated with Goodland limestone, which is part of the surface geology here.

This area also retains large tracts of intact native grasslands, primarily as large cattle ranches. The 3,400-acre Fort Worth Nature Center is located at the edge of the conservation area and preserves remnants of Chinquapin oak - bur oak forest (*Quercus muehlenbergii* - *Quercus macrocarpa*), pecan - sugarberry forest (*Carya illinoensis* - *Celtis laevigata*), and other terrestrial communities.

Threats include subdivision and housing development, development of the Barnett Shale gas field (which is contributing to fragmentation), and introduction of exotic plants used for revegetation following construction.

<sup>1</sup>This is a new proposed association, not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Jim Eidson (The Nature Conservancy).

## Eastern Crosstimbers

CA Type: Terrestrial  
Map #: WT12  
State: TX

Size: 153,248 acres (62,017 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Eastern Crosstimbers Conservation Area extends from eastern Cooke County into western Grayson County. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery, and appears to contain relatively large expanses of Crosstimbers Oak Forest and Woodland. Old-growth crosstimbers is predicted only for the far northern portion along the Red River (Peppers 2004), where steep bluffs would have made timber harvesting difficult. No surveys have been conducted in this conservation area, and further detailed information about its biodiversity significance is currently unavailable.

#### Literature Cited

Peppers, K. C. 2004. Old-Growth Forests in the Western Cross Timbers of Texas. Ph.D. Dissertation, Dept. of Biology, University of Arkansas, Fayetteville, AR. 171 pp.

## Era/Gainesville Prairies

CA Type: Terrestrial  
Map #: WT14  
State: TX

Size: 13,362 acres (5,407 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Era/Gainseville Prairies Conservation Area lies approximately 4-10 miles west and southwest of Gainesville in Cooke County, and is located within the Fort Worth Prairie subregion of the Grand Prairie. Though the status of the Grand Prairie is not known with any precision, it may now occupy just 3-5 percent of its former range. This conservation area is defined to include a cluster of prairie remnants of the little bluestem - big bluestem - yellow indiagrass (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans*, G3?<sup>1</sup>) calcareous prairie type, with gammagrass and switchgrass in gilgai microlows and drainages. As in other parts of the Grand Prairie, cattle grazing is the primary land use. Some tracts are part of the TPWD Public Dove Hunting program. Size of remnants is generally in the 100 to 500 acre range. Roughly 10 prairie remnants in medium to good condition were mapped by a Native Prairie Association of Texas volunteer in 2007. Most remnants would benefit from use of burning to reduce brush.

Subdivision of larger tracts and development comprise the primary threats. Most holdings are still used for ranching, but land prices in the area have increased significantly in the last decade. Key conservation strategies should include conservation of higher quality prairie remnants to limit subdivision and residential development.

<sup>1</sup>This is a new proposed association, not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Jim Eidson (The Nature Conservancy).

## Fort Worth Prairies

CA Type: Terrestrial  
Map #: WT19  
State: TX

Size: 148,406 acres (60,058 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Fort Worth Prairies Conservation Area lies southwest of the city of Fort Worth in eastern Parker, western Tarrant, and northern Johnson counties. It is located within the Fort Worth Prairie subregion of the Grand Prairie. Though the status of the Grand Prairie is not known with any precision, it may now occupy just 3-5 percent of its former range. Because of rocky, shallow soils, cattle ranching has been the primary landuse on the Grand Prairie, with row crop agriculture playing a secondary role. As a result, more native grassland has been left relatively intact than in the nearby Blackland Prairie. Tract size here is generally in the thousands of acres. This conservation area is thought to support some of the largest remaining examples of the little bluestem - big bluestem - yellow indiangrass (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans*, G3?) calcareous prairie type. Although a substantial portion of the conservation area is in a grazing disclimax (dominated by early to mid-successional native forbs and grasses), it may be feasible to restore many of these lands through more judicious grazing and the reintroduction of fire. Notably, much of this conservation area is underlain by Goodland limestone, the apparent pre-requisite for the globally rare Comanche Peak prairie-clover (*Dalea reverchonii*, G2). Many of the rare and endemic species are specialists within edaphic climaxes found on limestone glades.

Threats to the biological integrity of the Fort Worth Prairie are numerous and imminent. Fort Worth is rapidly growing to the southwest, and many former ranches are being converted to high density residential subdivisions. The 7,000 acre Walsh Ranch, which is largely unplowed native prairie, has been platted for subdivision and development, and according to the Dallas Business Journal, will be “transformed into a bustling community of about 44,000 people (Wethe 2002).” Energy development poses the second threat. Much of this conservation area is underlain by the Barnett Shale formation, which is rich in natural gas, but requires intensive extraction methods. Although alternative directional drilling methods are possible, many development companies are placing one well per 20 acres—the limit placed by the State. This method, referred to by some as “carpet bombing,” includes a footprint of up to 5 acres for each well, and more disturbance associated with road and pipeline development. Key conservation strategies should include promotion of conservation residential development and sustainable energy development.

Partners that are currently active in the conservation area include the Great Plains Restoration Council, as well as the Dixon Water Foundation which manages the 1,700-acre Bear Creek Ranch for sustainable agricultural production and prairie and watershed conservation.

#### Literature Cited

Wethe, D. 2002. Walsh Ranch is the latest rural space slated to make way for high-dollar development. Dallas Business Journal. March 15.

## Great Trinity Floodplain Forest

CA Type: Terrestrial  
Map #: SB02  
State: TX

Size: 40,552 acres (16,411 hectares)

Stratification Unit: Southern Blackland Prairie, Post Oak Savanna

### DESCRIPTION

The Great Trinity Floodplain Forest Conservation Area captures floodplain forest along stretches of the Trinity River in southern Dallas County and western Kaufman County. The forest represents one of the largest urban forests in the United States. Some unusual features occur there, such as a palmetto (*Sabal minor*) swamp that was the focus of Dallas County conservation efforts in the 1980s. Though much of the Trinity floodplain was plowed during the 19<sup>th</sup> century, regrowth has become mature bottomland hardwood forest. Pecan (*Carya illinoensis*), bur oak (*Quercus macrocarpa*), sugarberry (*Celtis laevigata*), American elm (*Ulmus americana*), and green ash (*Fraxinus pennsylvanica*) are typical canopy dominants.

Controversy currently surrounds this site due to plans by the U.S. Army Corp of Engineers and City of Dallas to develop the Trinity River Corridor to facilitate transportation, recreation, and flood control. According to critics, the development will have a deleterious impact on the forest where the removal of 34,000 trees has been suggested. The City of Dallas owns tracts of forest (Rochester Park and Great Trinity Forest Park, purchased in cooperation with the Trust for Public Land). The Audubon Society has been the other primary conservation entity working on conservation there.

## Guadalupe River Floodplain

CA Type: Terrestrial  
Map #: PS18  
State: TX

Size: 28,429 acres (11,505 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Guadalupe River Floodplain Conservation Area captures bottomland hardwood forest along the Guadalupe River and its tributary, Peach Creek, in Gonzales and DeWitt counties. Contained within these forests are populations of two plant species of conservation interest, Texas pinkroot (*Spigelia texana*, G3<sup>1</sup>) and Texas tauschia (*Tauschia texana*, G3).

<sup>1</sup> *Spigelia texana* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Hagerman NWR

CA Type: Terrestrial

Map #: NC31

State: TX

Size: 11,270 acres (4,561 hectares)

Stratification Unit: Northern Crosstimbers, Northern Blackland Prairie

### DESCRIPTION

The Hagerman NWR Conservation Area is based on the boundaries of the Hagerman National Wildlife Refuge in Grayson County. The refuge borders the Big Mineral Arm of Lake Texoma. It is the largest protected area in Texas that is representative of the Eastern Crosstimbers. Soils here are of the Aubrey (Haplustult), Crosstell, Callisburg, and Konsil series (Paleustalfs). Approximately 3,000 acres of marshes and open water on the refuge support migrating and overwintering waterfowl. The uplands (about 8,000 acres) are farmland and oak savanna. However, most of the area appears to be second-growth, and the herbaceous layer is poorly developed and sometimes dominated by exotics. The refuge employs fire management.

Given the federal protection, direct threats within the conservation area are minimal.

## Henrietta Range

CA Type: Terrestrial

Map #: WT09

State: TX

Size: 291,653 acres (118,028 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Henrietta Range Conservation Area may include the largest swath of contiguous tall grassland remaining in Texas. It lies immediately south of the Red River in Clay and Montague counties, and is generally northeast of Henrietta, the county seat. Dyksterhuis (1946) briefly mentions the “Reddish Prairies” west of the Western Crosstimbers. Soils are generally Mollisols (Paleustolls, Agriustolls), but Alfisol (e.g., Haplustalf) inclusions are not uncommon. Rainfall is an estimated 30 inches per year.

Based on general observation and a report produced by Bill Carr, a botanist for the Texas Chapter of The Nature Conservancy, the vegetation of the Henrietta Range appears to be an ecotone between the tallgrass regions to the east and the mixedgrass prairies to the west. Tallgrass species, such as little bluestem (*Schizachyrium scoparium*) and upland switchgrass (*Panicum virgatum*), are prevalent but midgrasses, including sideoats grama (*Bouteloua curtipendula*), are important. Further, a number of shortgrasses are important, including blue grama (*Bouteloua gracilis*) and a variety of *Chloris* species. Black-tailed prairie dog (*Cynomys ludovicianus*) colonies are historically known from this area.

Ranching has been the predominant landuse in the area, with row crop cultivation being relatively infrequent. There is a general local concern that “Dallasites” are moving into the area and subdividing previously large (4,000+ acres) ranches into weekend properties. In general, conservation here may be dependant upon working with the agricultural and ranching communities to enhance profitability and sustainability of their operations.

#### Literature Cited

Dyksterhuis, E. J. 1946. The Vegetation of the Western Cross Timbers. Ecological Monographs 18 (3): 325-376.

## Hood County Prairies

CA Type: Terrestrial

Map #: ST03

State: TX

Size: 187,759 acres (75,983 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers

### DESCRIPTION

The Hood County Prairies Conservation Area lies west of Granbury in Hood, Somervell, and Erath counties. This conservation area is underlain by both Lower Cretaceous limestone and sandstone. On calcareous uplands, soils are generally Calciustolls and Entisols. There are relatively small northwest-to-southeast trending Paleustalf uplands which, based on satellite imagery, appear to be fragmented and perhaps cultivated. Ground-truthing is needed. However, it is likely that most conservation elements will be associated with the calcareous geology ringing the site. This is primarily a potential tall grassland site, though the Alfisols within its interior may have historically (or currently) supported post oak - blackjack oak (*Quercus stellata* - *Quercus marilandica*) savanna. The conservation area contains the site type location for Comanche Peak prairie-clover (*Dalea reverchonii*, G2): Comanche Peak. One significant managed area, Dinosaur Valley State Park (1,274 acres), is located on the southern edge of this area, on the Paluxy River near Glen Rose. The park protects several vegetative system targets, as well as black-capped vireo (*Vireo atricapilla*, G2G3), golden-cheeked warbler (*Dendroica chrysoparia*, G2), and other faunal conservation elements.

Threats include subdivision of larger land holdings, potential development of the Barnett Shale gas field, and urbanization (residential and commercial) expanding from both Glen Rose and Granbury.

## Knight Prairie

CA Type: Terrestrial  
Map #: PS04  
State: TX

Size: 6,598 acres (2,670 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Knight Prairie Conservation Area, located in Hunt County, is named after an 86-acre preserve owned by The Nature Conservancy. Established in 2003, the Knight Prairie Preserve is a bottomland meadow containing an unusual wetland complex of flooded grassland, ponds, sloughs, and streamside woodlands. The area within the preserve has never been plowed, which makes it especially unique since European settlers and agricultural Native Americans preferred bottomlands for farmland because of their inherent fertility. Home to a wide variety of butterflies, birds, and aquatic life, the preserve habitat is generally described as eastern gammagrass - switchgrass - yellow indiagrass - Michaelmas-daisy (*Tripsacum dactyloides* - *Panicum virgatum* - *Sorghastrum nutans* - *Helianthus maximiliani*, G1) prairie, based on the plant types represented there. Scores of butterfly species have been seen on the preserve, including swallowtails, sulphurs and whites, gossamer wings, snouts, longwings, and brushfoots. Ducks sightings include blue- and green-winged teals, northern pintails, American wigeons, and canvasback, redhead, and wood ducks. Other birds reported from the preserve include herons, marsh wrens, northern harriers, sharp-shinned and red-tailed hawks, dickcissels, loggerhead shrikes, and savannah, grasshopper and Le Conte's sparrows.

The preserve is contained within a meander of the Cowleech Fork of the Sabine River. It is believed that the fork was named for a Shawnee Indian chief, Cow Leach, who lived in the vicinity in the late 1830s and early 1840s.

A partnership between Texas A&M University-Commerce and The Nature Conservancy will facilitate the study and conservation of this globally imperiled prairie wetland. In addition to using it as a site for field study for university students, Texas A&M University-Commerce plans to use the preserve as a venue for educating teachers about natural history and environmental science, and for conducting public outreach to Hunt County local schools.

## Lake Somerville

CA Type: Terrestrial  
Map #: PS12  
State: TX

Size: 132,526 acres (53,631 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Lake Somerville Conservation Area lies at the junction of Lee, Burleson, and Washington counties, including and surrounding Lake Somerville. Surface geology includes the Miocene Catahoula Formation in the east and various clayey Eocene formations in the west.

Conservation targets known from this area include one association-level terrestrial ecological community and three G2-G3 plant species. The community is post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland; the area contains at least one fair example. Two of the plant targets are known from open claypan savanna woodlands south of the reservoir. Branched gay-feather (*Liatris cymosa*, G2), a Texas endemic that is found primarily in the Crosstimbers and Southern Tallgrass Prairies Ecoregion, is represented by several occurrences of various sizes that collectively probably represent one of the few known viable populations and the best opportunity for conservation. Populations of Navasota ladies'-tresses (*Spiranthes parksii*, G3), a federally-listed endangered orchid, in this area are rather small. Another G3 target, Texas pinkroot (*Spigelia texana*<sup>1</sup>), is represented by a population of uncertain size that lies within a hardwood forest along the Yegua Creek bottoms, most of which was inundated in construction of the reservoir.

Much of the property around Lake Somerville is owned by the U.S. Army Corps of Engineers for recreational use. Texas Parks and Wildlife Department manages the 6,290-acre Lake Somerville State Park and Trailway as well as the 3,110-acre Somerville WMA. These sites contain examples of post oak - blackjack oak, water oak (*Quercus nigra*) - post oak, sugarberry - cedar elm (*Celtis laevigata* - *Ulmus crassifolia*), and other forest and woodland types, with a small amount of little bluestem - yellow indiagrass - prairie bishop (*Schizachyrium scoparium* - *Sorghastrum nutans* - *Bifora americana*, G1) Alfisol herbaceous vegetation (approximately 200 acres).

<sup>1</sup> *Spigelia texana* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Lampasas Cut Plain Grasslands

CA Type: Terrestrial  
Map #: ST09  
State: TX

Size: 377,075 acres (152,597 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers, Southern Blackland Prairie

### DESCRIPTION

The Lampasas Cut Plain Grasslands Conservation Area, located in Bell and Coryell counties, crosses two ecoregions: Edwards Plateau and Crosstimbers and Southern Tallgrass Prairie. It lies within the Lampasas Cut Plain, a geological subregion that is “characterized by mesa topography, with wide valleys separating uplands capped by limestone. Narrow canyons occur on the margin of uplands throughout this region (Halstead and Nesvacil, 2005).” Soils are typically loamy limestone residuum or clayey residuum.

This conservation area is ecologically complex and captures a high degree of biodiversity. Elements of conservation interest that have been documented from this CA<sup>1</sup> include the federally-listed golden-cheeked warbler (*Dendroica chrysoparia*, G2) and black-capped vireo (*Vireo atricapilla*, G2G3), Bell’s vireo (*Vireo bellii*, G5), dickcissel (*Spiza americana*, G5), painted bunting (*Passerina ciris*, G5), Hall’s prairie-clover (*Dalea hallii*, G3), plateau milkvine (*Matelea edwardsensis*, G3), shining coral-root orchid (*Hexalectris nitida*, G3), sycamore-leaved snowbell (*Styrax platanifolius* ssp. *platanifolius*, G3T3), Texas fescue (*Festuca versuta*, G3), cave-obligate harvestman (*Texella fendi*, G1G2), little bluestem - big bluestem - yellow indiagrass (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans*, G3<sup>2</sup>) calcareous herbaceous vegetation, and significant expanses of Southeastern Great Plains Tallgrass Prairie.

The conservation area is notable for the presence of the 218,829 acre Fort Hood Military Reservation. The Nature Conservancy has had a strong partnership with the Department of Defense in regards to Fort Hood since 1992. Initially the partnership focused on research and management of the black-capped vireo and golden-cheeked warbler populations on Fort Hood, but the agreement has expanded since then to include other natural resources, such as karst features and fauna, on and near Fort Hood (Halstead and Nesvacil, 2005). The lands surrounding the base are rapidly being developed and fragmented, resulting in Fort Hood becoming essentially “an island of high quality habitat for many species (Halstead and Nesvacil 2005).”

<sup>1</sup> Only occurrences of targets (elements of conservation interest) identified for the Crosstimbers & Southern Tallgrass Prairie Ecoregional Assessment are listed here. In reality this conservation area also captures targets that were identified for the Edwards Plateau Ecoregional Assessment.

<sup>2</sup>This is a new proposed association, not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Jim Eidson (The Nature Conservancy).

#### Literature Cited

Halstead, L. and K. Nesvacil. 2005. Fort Hood Conservation Action Plan. The Nature Conservancy, TX.

## Lavaca/Colorado County Crosstimbers

CA Type: Terrestrial

Map #: PS20

State: TX

Size: 183,254 acres (74,160 hectares)

Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Lavaca/Colorado County Crosstimbers Conservation Area is located primarily in eastern Lavaca and southern Colorado counties, with a small portion extending into northern Jackson County. The area is predominantly characterized by nearly level topography, underlain by sandy Pleistocene sediments of the Lissie Formation. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery. It incorporates extensive post oak woodlands south and southeast of Columbus, as well as patches of prairie and bottomland forests along Sandy Creek and the Navidad River. The federally-listed endangered Houston toad (*Bufo houstonensis*, G1) has been documented in this conservation area, but the current status of the population is unknown.

## Limestone Oaks

CA Type: Terrestrial  
Map #: PS09  
State: TX

Size: 45,280 acres (18,324 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Limestone Oaks Conservation Area is located primarily in southern Limestone County, with a small portion represented in Falls and Robertson counties. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery, and appears to be dominated by plant communities representative of East-Central Texas Plains Post Oak Savanna and Woodland. The geology is of the Wilcox Group, which includes the Calvert Bluff, Simsboro, and Hooper formations. These are generally sandy mudstones. Detailed information about the biodiversity significance of this conservation area is currently lacking, and further groundtruthing is needed.

## Limestone Savannas

CA Type: Terrestrial  
Map #: SB04  
State: TX

Size: 89,521 acres (36,228 hectares)

Stratification Unit: Southern Blackland Prairie, Post Oak Savanna

### DESCRIPTION

The Limestone Savannas Conservation Area lies primarily in Limestone County, with a small portion extending into eastern Falls County. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery, and appears to be dominated by plant communities representative of East-Central Texas Plains Post Oak Savanna and Woodland. The geology is of the Wilcox Group, which includes the Calvert Bluff, Simsboro, and Hooper formations. These are generally sandy mudstones. Detailed information about the biodiversity significance of this conservation area is currently lacking, and further groundtruthing is needed.

## Manning/Wingo Prairie

CA Type: Terrestrial  
Map #: PS05  
State: TX

Size: 7,847 acres (3,175 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Manning/Wingo Prairie Conservation Area, located in Van Zandt County, contains an archipelago of both small and large prairie remnants. These prairie remnants are generally underlain by Taylor marl parent material, and typical soils are of the Crockett series (Udertic Paleustalfs). All of the known remnants within the area are of the little bluestem - yellow indiagrass - prairie bishop (*Schizachyrium scoparium* - *Sorghastrum nutans* - *Bifora americana*, G1G2) Alfisol blackland prairie type. The Manning Meadow is the best and largest known example of this prairie type. The prairie occurrence occupies approximately 300 acres and is imbedded within a 562-acre tract. The Wingo Meadow was, within the past 10 years, approximately 300 acres. However, approximately half of the property has been subdivided and developed. Both properties were part of a private lands registry program. Other small remnants are known from the area.

This area is developing at a moderate pace. The Manning Meadow is within less than a mile of the border of Wills Point. Wood, Rains, Van Zandt and adjacent counties are becoming popular havens for Dallas weekenders and retirees wishing to flee the congestion of the city.

## Mathews Prairie

CA Type: Terrestrial  
Map #: NB04  
State: TX

Size: 120 acres (49 hectares)

Stratification Unit: Northern Blackland Prairie

### DESCRIPTION

The Mathews Prairie Conservation Area, located in western Hunt County, contains approximately 114 acres of the eastern gammagrass - switchgrass - yellow indiagrass - Michaelmas-daisy (*Tripsacum dactyloides* - *Panicum virgatum* - *Sorghastrum nutans* - *Helianthus maximiliani*, G1) prairie type. It is one of the best known examples of this community type in Texas. The site is underlain by Taylor marl, which supports Vertisols largely of the Houston Black series. Gilgai development is extensive on this remnant prairie. About 100 acres are protected by a conservation easement held by The Nature Conservancy. Several small (less than an acre) degraded remnants are also included within the conservation area. The site adjoins a 2,000 acre ranch on its eastern boundary.

The conservation area is approximately 8 miles northeast of Greenville, Texas and is subject to increasing development pressure. For example, a church-sponsored water theme park is being developed adjacent to the conservation area. The theme park is expected to host both recreational water features and a 10,000-seat auditorium. Immediate impacts will include expansion and paving of the current gravel county roads, which may result in direct loss of some of the prairie, alteration of hydrology, and increased edge effect. Indirect threats will include an increase in development of businesses serving the theme park, as well as the probability that smokeshed issues will decrease use of prescribed fire.

## MCR Prairie

CA Type: Terrestrial  
Map #: SB03  
State: TX

Size: 431 acres (174 hectares)  
Stratification Unit: Southern Blackland Prairie

### DESCRIPTION

The MCR Prairie Conservation Area is located in northern Kaufman County, along High Point Creek. The conservation area is named for and designed around a well-known Blackland Prairie remnant. The conservation area is underlain by Taylor Marl, though approximately half of the prairie occurrence has Pleistocene-aged alluvium as the parent material. Soils are primarily Vertisols of the Houston Black and Burleson series (the former derived from marls, the latter from alluvium). The MCR prairie is 200 acres, embedded within an approximately 600 acre tract. The land has been under the same ownership for approximately 140 years. This prairie is considered to be the little bluestem - yellow indiagrass - big bluestem - prairie bishop (*Schizachyrium scoparium* - *Sorghastrum nutans* - *Andropogon gerardii* - *Bifora americana*, G1G2) Vertisol herbaceous vegetation type. Although the grassland community is similar to other northern Blackland Prairie sites, it is rather unique in its level of expression of species with both eastern and western distributions. An informal inventory (R. O'Kennon, personal communication, 2008) indicated the presence of as many as 600 species. The prairie also supports one of the largest known populations (about 1,000 individuals) of the Texas wide-leaf false aloe (*Manfreda virginica* ssp. *lata*, G5T1T2Q<sup>1</sup>), a subspecies restricted to unplowed prairies and known from only a few locations in Texas. Topeka purple-coneflower (*Echinacea atrorubens*, G3) has been documented on the prairie in the past; the current status is unknown.

This portion of Kaufman County is developing rapidly. Ranchette and high density residential development are threats. A current threat is also posed by infrastructure development. An electrical substation was imposed on the property (outside the prairie occurrence) and the land was condemned for installation of a pipeline in the 1980s.

<sup>1</sup> *Manfreda virginica* ssp. *lata* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Meridian Plateau

CA Type: Terrestrial  
Map #: ST08  
State: TX

Size: 467,115 acres (189,035 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers, Southern Blackland Prairie

### DESCRIPTION

The Meridian Plateau Conservation Area is located primarily in western Bosque and eastern Hamilton counties, but also extends into northern Coryell and eastern McLennan counties. The area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery. Lying within the Lampasas Cut Plain geological subregion, this conservation area is characterized by rolling hill country with limestone soils and exposures, dissected by forks and tributaries of the North Bosque River (e.g., Meridian Creek and Neils Creek). Benched topography typical of the Walnut Formation of Lower Cretaceous age is common. Typical soils include Lithic Haplustolls and Typic Ustochrepts of the Eckrant, Brackett, and Cranfill soil series. Southeastern Great Plains Tallgrass Prairie is thought to be the predominant matrix system on uplands. Limestone bluffs support Buckley oak - Texas ash - Ashe juniper (*Quercus buckleyi* - *Fraxinus texensis* - *Juniperus ashei*, G3) forest, as well as the endangered golden-cheeked warbler (*Dendroica chrysoparia*, G2). The endangered black-capped vireo (*Vireo atricapilla*, G2G3) has also been documented in the conservation area, but the breeding population may not be viable.

The vast majority of this conservation area is privately owned. Meridian State Park (502 acres) is located in the northeastern portion of the conservation area. The state park includes a remnant of Buckley oak - Texas ash - Ashe juniper forest, and golden-cheeked warblers are known to use the area. The Texas Land Conservancy holds a conservation easement on 100 acres adjacent to the park.

Population in this region is relatively static, though development of weekend homes and ranchettes is becoming more common. In some areas, the trend has been consolidation of small holdings into larger properties, rather than the reverse.

## Middle Trinity

CA Type: Terrestrial  
Map #: PS08  
State: TX

Size: 1,625,906 acres (657,981 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Middle Trinity Conservation Area is one of the largest conservation areas in the ecoregion. It is located primarily in Anderson, Houston, Freestone, and Leon counties, but also extends into Henderson, Madison, and Navarro counties. The conservation area incorporates alluvial bottomlands along the Trinity River and its tributaries and also contains significant upland environments atop a broad spectrum of Eocene geologic formations. The bottomlands include such communities as water oak - (white oak, willow oak) (*Quercus nigra* - *Quercus (alba, phellos)*) forest, American elm - (sugar hackberry - common hackberry) - green ash (*Ulmus americana* - *Celtis (laevigata, occidentalis)* - *Fraxinus pennsylvanica*, G3?) forest, white oak - mockernut hickory - sweetgum (*Quercus alba* - *Carya alba* - *Liquidambar styraciflua*) forest, and overcup oak - water hickory (*Quercus lyrata* - *Carya aquatica*) forest. Predominant communities on the adjacent uplands include post oak - blackjack oak - black hickory - (Shumard oak, black oak) (*Quercus stellata* - *Quercus marilandica* - *Carya texana* - (*Quercus shumardii* - *Quercus velutina*), G3G5) forest and post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland. The area also includes numerous examples of two important small-patch terrestrial ecological systems, East-Central Texas Plains Xeric Sandhill and West Gulf Coastal Plain Herbaceous Seepage Bog, which support disjunct and endemic flora.

The Middle Trinity area is very rich in rare plant species, and perhaps richer in rare plant taxa than any other conservation area in the ecoregion. Populations of at least eleven plant species targets have been reported. Most notable among these targets is large-fruited sand-verbena (*Abronia macrocarpa*, G2), a federally-listed endangered species that is probably the most imperiled plant species in the ecoregion. It is an ecoregional endemic, and it is known from only one other conservation area (Navasota/Carrizo Sands). Its habitat, and similar open sandhill spots, are home to several other species of conservation interest, including golden wave tickseed (*Coreopsis intermedia*, G3), sandhill woolly-white (*Hymenopappus carrizoanus*, G2), Texas sand-mint (*Rhododon ciliatus*, G3), and Centerville Brazos-mint (*Brazoria truncata* var. *pulcherrima*, G4T3). The Centerville Brazos-mint is an ecoregional endemic that is locally common here; it occurs in only one other conservation area (Navasota/Carrizo Sands). Wooded areas on the area's deep sands are home to two other rare species, Warner's hawthorn (*Crataegus warneri*, G3Q) and Soxman's milk-vetch (*Astragalus soxmaniorum*, G3). Bogs and other wetland types associated with these deep sands provide habitat for additional rarities, including paniced indigo-bush (*Amorpha paniculata*, G2G3), rough-stemmed aster (*Aster puniceus* var. *scabricaulis*, G5T2Q), small-headed pipewort (*Eriocaulon koernickianum*, G2), Chapman's yellow-eyed grass (*Xyris chapmanii*, G2<sup>1</sup>), and rough-leaf yellow-eyed grass (*Xyris scabrifolia*, G3<sup>2</sup>). The Middle Trinity also includes claypan savanna woodlands that are known to support at least one population of the endangered Navasota ladies'-tresses (*Spiranthes parksii*, G3), another federally listed species.

A number of parks and preserves are located within the conservation area. One of the most notable is the Gus Engeling State Wildlife Management Area, an 11,035-acre tract in northwestern Anderson County which contains relatively undisturbed examples of many forest and woodland types found in the area. Floristic inventories have documented more than 1,000 plant species at the site. North of Engeling are large recreational ranches and hunting clubs which manage thousands of acres of contiguous forest. Comparable in diversity, but further south in Leon County, is the 1,800-acre Fort Boggy State Park. At the eastern edge of the conservation area are two tracts with pine-hardwood forest typical of East Texas, the 450-acre Ivy's Wildlife Refuge owned by the Texas Land Conservancy and a nearby 700-acre conservation easement held by The Nature Conservancy. On or near the

## Middle Trinity (cont'd)

### DESCRIPTION

Trinity River, Texas Parks and Wildlife Department operates several sizeable tracts of bottomland hardwood forest for wildlife management, including Big Lake Bottom WMA (4,929 acres), Richland Creek WMA (13,796 acres), and Keechi Creek WMA (1,590 acres), as well as an upland tract, Fairfield Lake State Park (1,400 acres).

<sup>1</sup>*Xyris chapmanii* is not currently recognized by NatureServe. The source of this GRANK is Poole et al. (2007).

<sup>2</sup>*Xyris scabrifolia* is not currently recognized by NatureServe. The source of this GRANK is Poole et al. (2007).

#### Literature Cited

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.

## Mineral Wells Crosstimbers

CA Type: Terrestrial

Map #: ST01

State: TX

Size: 158,762 acres (64,249 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers, Western Tallgrass and Crosstimbers

### DESCRIPTION

The Mineral Wells Crosstimbers Conservation Area is located primarily in Parker County, but also extends into Jack County. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery. The site is underlain by soils of the Windthorst-Duffau-Weatherford association (Paleustalfs, Haplustalfs), Chaney-Truce-Bonti association (Paleustalfs), and the Truce-Bonti association (Paleustalfs). The area appears to support relatively large and intact expanses of Crosstimbers Oak Forest and Woodland. Predictive modeling by Peppers (2004) indicates that there may be several remnants of old-growth crosstimbers in the western finger of the conservation area. This area is characterized by steep ridges east of Mineral Wells.

There are a few sites in this conservation area that are under formal protection. The Nature Conservancy has an easement on an 800-acre ranch in western Parker County which supports approximately 300 acres of old-growth Crosstimbers oak forest. Mineral Wells State Park and Fort Wolters are north of this easement and contain approximately 6,400 acres of similar vegetation. Comanche Peak prairie-clover (*Dalea reverchonii*, G2) is known to occur on the eastern edge of the conservation area. However, these occurrences are located on calcareous geology, an exception to the rule within the site. Quayle's ragwort (*Senecio quaylei*, G1) is known only from the type location in western Parker County, where it occurs in a weedy roadside ditch.

The outward expansion of Dallas and Ft. Worth has resulted in the subdivision of larger land holdings, primarily for hunting properties. Wind farm development is also a potential issue. Without proper siting, wind turbines and associated infrastructure may directly or indirectly impact wildlife and habitat within the conservation area.

#### Literature Cited

Peppers, K. C. 2004. Old-Growth Forests in the Western Cross Timbers of Texas. Ph.D. Dissertation, Dept. of Biology, University of Arkansas, Fayetteville, AR. 171 pp.

## Montague County Crosstimbers

CA Type: Terrestrial  
Map #: WT10  
State: TX

Size: 146,465 acres (59,272 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Montague County Crosstimbers Conservation Area is located primarily in eastern Montague County, but also extends into western Cook County. The area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery. Typical soils are Alfisols, primarily belonging to the Windthorst-Duffau association (Paleustalfs). Mollisols are also present, primarily belonging to the Aledo-Venus-Bolar association (Haplustolls and Calciustolls). In general, the conservation area is characterized by typical western Crosstimbers oak woodlands with native grass understory or thicketized savanna with closed canopy and little herbaceous development. Limestone glades and tallgrass prairie are patch occurrences in Mollisols, but there may be some larger prairie areas. The dominant grass species is often little bluestem (*Schizachyrium scoparium*), generally occurring with yellow indiagrass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), or midgrasses. Rare species such as Reverchon's scurf-pea (*Pediomelum reverchonii*, G3) are associated with the thin-soiled Mollisol patches. Black-capped vireo (*Vireo atricapilla*, G2G3) has reemerged in Montague County in recent years, and may be associated with Calciustoll shrubby communities on hilltops.

The rate of urbanization is slower in Montague County as compared to counties closer to the Dallas-Fort Worth area. However, there is probably still a trend toward sale and subdivision of larger holdings. These smaller tracts are typically used as hobby ranches and hunting properties. Proposed development of wind farms on ridgelines is another potential issue. Without proper siting, wind turbines and associated infrastructure may directly or indirectly impact wildlife and habitat within the conservation area.

## Navasota/Carrizo Sands

CA Type: Terrestrial  
Map #: PS10  
State: TX

Size: 709,706 acres (287,208 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Navasota/Carrizo Sands Conservation Area is located in eastern Brazos, southeastern Robertson, southwestern Leon, and western Grimes and Madison counties. Surface geology is not readily summarized; numerous Miocene and Eocene formations are involved. The area incorporates claypan savanna prairies and woodlands in the south (e.g., Grimes County) and a mosaic of sandhills and post oak woodlands on the Carrizo Sand in the north (e.g., southern Leon County). Several terrestrial ecological communities have been mapped within this conservation area. The matrix community of uplands is the post oak - blackjack oak / little bluestem (*Quercus stellata* - *Quercus marilandica* / *Schizachyrium scoparium*, G4) woodland; it is replaced in a few areas by loblolly pine - post oak (*Pinus taeda* - *Quercus stellata*) Lost Pines forest / woodland. The conservation area also includes alluvial bottomlands along the Trinity River and its tributaries. The floodplain forests are comprised of post oak, water oak (*Quercus nigra*), and other hardwood species. The area also includes examples of two important small-patch terrestrial ecological systems, East-Central Texas Plains Xeric Sandhill and West Gulf Coastal Plain Herbaceous Seepage Bog, which support disjunct and endemic flora.

From the plant species perspective, this large site is one of the most significant conservation areas in the ecoregion. More than ten target plant species are present, some of which are not found in abundance in any other conservation area. Many of these species are concentrated on Carrizo sandhills and other deep sand habitats in the northern part of the area. Among these areniphiles, large-fruited sand-verbena (*Abronia macrocarpa*, G2) is the rarest. This species is an ecoregional endemic as well as a federally-listed endangered species. Five of its eight known populations lie within this conservation area; all of the other known populations are known from the Middle Trinity Conservation Area. Other G2 and G3 Texas endemics known from the Carrizo portion of this conservation area include Centerville Brazos-mint (*Brazoria truncata* var. *pulcherrima*, G4T3), sandhill woolly-white (*Hymenopappus carrizoanus*, G2), Parks' jointweed (*Polygonella parksii*, G2) and Texas sand-mint (*Rhododon ciliatus*, G3). The Houston toad (*Bufo houstonensis*, G1), a federally-listed endangered species that is endemic to southcentral Texas, has also been documented in deep sandy soils within the northern part of the conservation area. Habitat loss and conversion, road mortality, and predation by red imported fire ants (*Solenopsis invicta*) pose significant threats to the few, small populations of this species that remain across its range.

Another botanical hotspot lies at the southern end of the conservation area, near Bryan-College Station and Navasota. This part of the ecoregion is home to eighty-three mapped occurrences of Navasota ladies'-tresses (*Spiranthes parksii*, G3), a federally-listed endangered species; while it is uncertain how many extant populations this number represents, it is clear that this conservation area is the single most important site for this endemic orchid. Equally important are the area's two tiny occurrences of Navasota false-foxglove (*Agalinis navasotensis*), a G1 species known from two private tracts just east of the city of Navasota and another site in the Pineywoods region (Tyler County, specifically). The southern part of the conservation area is also very important for Texas meadowrue (*Thalictrum texanum*, G2Q), a Texas endemic; populations in claypan savanna sites north of Navasota are the largest currently known. One of these is protected by a conservation easement held by the Texas Land Conservancy. Branched gay-feather (*Liatris cymosa*), another G2 Texas endemic, also occurs in claypan savannas in this part of the ecoregion; it is locally common in post oak openings within the city of College Station, and hopefully other large populations will be discovered in a more defensible setting. Lick Creek Park (515 acres) in College Station contains examples of sandhill, woodland, and bog communities, as well as some of the rare plant species mentioned above.

## Northern Cooke County Grasslands

CA Type: Terrestrial  
Map #: WT11  
State: TX

Size: 81,538 acres (32,997 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Northern Cooke County Grasslands Conservation Area is located immediately south of the Red River in Cooke County. This conservation area is a grassland site underlain by Alfisols (Normangee-Wilson-Crockett association: Haplustalfs, Paleustalfs and Ochraqualfs), Mollisols/Vertisols, and Entisols (Sanger-Maloterre-Venus association: Chromusterts, Ustorthents, and Calciustolls). Part of the Grand Prairie, this area is expected to support typical little bluestem - big bluestem - yellow Indiangrass (*Schizachyrium scoparium* - *Andropogon gerardii* - *Sorghastrum nutans*, G3<sup>2</sup>) calcareous herbaceous vegetation, but may have a high degree of plant community diversity given the multiple soil orders represented there. This conservation area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery. Detailed information about the biodiversity significance of this conservation area is currently lacking, and further groundtruthing is needed.

Muenster is the largest city within the area. As in other rural areas of the district, there is a general pattern of large holdings being subdivided for ranchette development and small hunting ranches. Barnette Shale gas well development is also a substantial threat. Ranches in the area range from 100s to 1000s of acres in size.

<sup>1</sup>This is a new proposed association, not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Jim Eidson (The Nature Conservancy).

## Ray Roberts Prairie

CA Type: Terrestrial  
Map #: WT16  
State: TX

Size: 337 acres (137 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Ray Roberts Prairie Conservation Area is located northwest of Denton on the Ray Roberts Reservoir in Denton County. The site is underlain by the Navo-Wilson association (Chromusterts, Ochraqualfs). The land is owned by the federal government (U.S. Army Corps of Engineers), with areas managed by Texas Parks and Wildlife Department as a Wildlife Management Area. The land is, or has recently been, under grazing management with a regime of 6 months winter grazing followed by 6 months growing season rest. Invasion by brush and exotic plant species, such as Japanese brome (*Bromus japonicus*), is common. Fire management has been limited. The prairie, despite some condition problems, is relatively large for an eastern prairie. The occurrence is approximately 400 acres and has been tentatively classified as little bluestem - yellow indiagrass - prairie bishop (*Schizachyrium scoparium* - *Sorghastrum nutans* - *Bifora americana*, G1G2) Alfisol herbaceous vegetation.

The U.S. Army Corps of Engineers has considered a long term lease to private entities for the property, with possible land uses including a golf course and the construction of a large amphitheater for church-related events.

## Robber Baron Cave

CA Type: Terrestrial  
Map #: SB05  
State: TX

Size: 57 acres (23 hectares)

Stratification Unit: Southern Blackland Prairie

### DESCRIPTION

The Robber Baron Cave Conservation Area, located within the city limits of San Antonio in Bexar County, is named after the cave present at the site. This conservation area represents the only critical habitat unit designated by the U.S. Fish and Wildlife Service for Cokendolpher cave harvestman (*Texella cokendolpheri*, G1G2) and Robber Baron Cave meshweaver (*Cicurina baronia*, G1G2). Federally listed as endangered, these species appear to be endemic to Bexar County (U.S. Fish and Wildlife Service 2003). Furthermore, given that this area is geologically isolated from other karst areas in Bexar County, these two species are probably endemic to this particular cave (Veni 1994). As a result, management and protection of Robber Baron Cave are considered critical to the conservation of these two species.

Robber Baron Cave is thought to be the longest cave system in Bexar County, with approximately 0.94 miles of passageways known within a square area approximately 328 ft on each side (Veni 1988). Because the surface area above this cave is almost completely developed for residential and commercial uses with very little existing natural vegetation, only the subsurface is considered critical habitat by the USFWS. The Texas Cave Management Association (TCMA) currently owns and manages the cave entrance, as well as about 0.2 hectares surrounding the opening (U.S. Fish and Wildlife Service 2003).

#### Literature Cited

- U.S. Fish and Wildlife Service. 2003. U.S. Fish and Wildlife Service. Part II: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Seven Bexar County, Texas, Invertebrate Species; Final Rule. (50 CFR Part 17). Federal Register 68 (67): 17156-17231.
- Veni, G. 1988. The Caves of Bexar County. Texas Memorial Museum Speleological Monographs 2. The University of Texas, Austin, Texas.
- Veni, G. 1994. Geologic Controls on Cave Development and the Distribution of Endemic Cave Fauna in the San Antonio, Texas, Region. Section 6 Report prepared for the Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service. 99 pp.

## Salem

CA Type: Terrestrial

Map #: PS16

State: TX

Size: 35,987 acres (14,563 hectares)

Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Salem Conservation Area encompasses parts of southern Bastrop, western Fayette, northern Gonzales, and eastern Caldwell counties. Surface geology is a potpourri of Eocene substrates, including deep sands of the Queen City Formation in the west and clays of the Cook Mountain and Yegua formations at the eastern end, with smaller bands of Weches ironstone and Sparta sand between. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery, and appears to be dominated by plant communities representative of East-Central Texas Plains Post Oak Savanna and Woodland. Detailed information about the biodiversity significance of this conservation area is currently lacking, and further groundtruthing is needed.

## Somervell County Prairies

CA Type: Terrestrial

Map #: ST05

State: TX

Size: 192,638 acres (77,958 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers

### DESCRIPTION

The Somervell County Prairies Conservation Area is located in southwestern Somervell, eastern Erath, and northern Bosque counties. This area was identified using National Land Cover Data (NLCD 1992 and 2001) and satellite imagery. The soils are underlain by Lower Cretaceous limestone and primarily belong to the Tarrant-Purves soil association (Calciustolls). For north-central Texas, this area has dramatic topography. Generally the plain is crossed by north-south trending limestone ridges. The ridges support limestone glade communities and mesic slope forest dominated by Ashe juniper (*Juniperus ashei*), Spanish oak (*Quercus falcata*), post oak (*Quercus stellata*), Texas ash (*Fraxinus texensis*), and other hardwoods. Where deeper soils permit, grassland communities representative of the Southeastern Great Plains Tallgrass Prairie system prevail. Species of conservation interest documented in this conservation area include the federally-listed endangered golden-cheeked warbler (*Dendroica chrysoparia*, G2) and black-capped vireo (*Vireo atricapilla*, G2G3), as well as painted bunting (*Passerina ciris*, G5) and Bell's vireo (*Vireo bellii*, G5).

Home to both famed regional nature writer John Graves and the Fossil Rim Wildlife Center, there is a high degree of environmental sentiment in the area.

The primary threat here is urbanization. Glen Rose has become a popular retreat for "Dallasites" who are building ranchette homes. Furthermore, the existing Glen Rose population is expanding with increased tourism and associated jobs. Barnett Shale gas development is less of a threat than in the northern reaches of the Grand Prairie, but is a possibility as exploration of the area continues.

## South Sulphur River Floodplain

CA Type: Terrestrial  
Map #: NB03  
State: TX

Size: 55,055 acres (22,280 hectares)

Stratification Unit: Northern Blackland Prairie, Post Oak Savanna

### DESCRIPTION

The South Sulphur River Floodplain Conservation Area is located in eastern Hunt County and along the Hopkins/Delta county line. Identified using satellite imagery, National Land Cover Data (1992 and 2001), and soils information, this site is designed to capture the remaining segments of floodplain forest found along the South Sulphur River.

Much of the original floodplain forest was destroyed with the creation of Cooper Lake in 1992. The U.S. Army Corps of Engineers built the lake to help control flooding and provide a water supply for nearby towns. The area surrounding the lake, Cooper Lake State Park, is managed by Texas Parks and Wildlife Department and used for recreational activities.

## Southern Fort Worth Prairies

CA Type: Terrestrial  
Map #: ST04  
State: TX

Size: 265,355 acres (107,385 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers

### DESCRIPTION

The Southern Fort Worth Prairies Conservation Area encompasses portions of Parker, Hood, Johnson, Somervell, and Hill counties. It represents one of the largest grassland sites in the ecoregional portfolio, and was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001). The area is underlain by Lower Cretaceous limestone. Lithic Haplustolls, Typic Calciustolls, and Cumulic Haplustolls of the Aledo, Bolar, and Brackett soil series are common. Southeastern Great Plains Tallgrass Prairie is considered to be the matrix ecological system.

Visitation by The Nature Conservancy staff has been limited to three sites within this conservation area. The first two are smaller tracts totaling about 300 acres in Parker County (one of which is now conserved by an easement with The Nature Conservancy), and the third is a 600 acre tract in Hood County (now under a conservation easement held by the Connemara Conservancy). All three tracts visited had limestone glade communities on Calciustolls, small patch occurrence of calcareous soil tallgrass prairie, and mesic slope forests with Buckley oak - Texas ash - Ashe juniper (*Quercus buckleyi* - *Fraxinus texensis* - *Juniperus ashei*, G3). Elements of conservation interest in the area include colonial nesting sites, golden-cheeked warbler (*Dendroica chrysoparia*, G2), Comanche Peak prairie-clover (*Dalea reverchonii*, G2), Engelmann's bladderpod (*Lesquerella engelmannii* ssp. *engelmannii*, G4T3<sup>1</sup>), and Reverchon's scurf-pea (*Pedimelum reverchonii*, G3).

Cleburne State Park (528 acres) is located within this area and contains pecan - sugarberry (*Carya illinoensis* - *Celtis laevigata*) woodland and Buckley oak - Texas ash - Ashe juniper forest. The Vivian Malone Preserve owned by the Texas Land Conservancy is located just outside the conservation area and contains similar habitats.

Gravel mining along the Brazos River, development of the Barnett Shale gas field, subdivision and development, and possibly windfarm development are threats here. Ranchette and commercial development is increasing at this time and large holdings appear to be rare.

<sup>1</sup>*Lesquerella engelmannii* ssp. *engelmannii* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

## Southwestern Crosstimbers

CA Type: Terrestrial

Map #: ST02

State: TX

Size: 154,519 acres (62,532 hectares)

Stratification Unit: Southwestern Tallgrass and Crosstimbers

### DESCRIPTION

The Southwestern Crosstimbers Conservation Area, located in northwestern Erath and eastern Eastland counties, is underlain by sandstone and shale, with soils generally in the Truce-Bonti-Owens association (Paleustalfs). The area was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001), and is expected to be dominated by plant communities representative of Crosstimbers Oak Forest and Woodland. Predictive modeling by Peppers (2004) indicates that there may be several remnants of old-growth crosstimbers in the northern portion of the site.

Threats include wind farm development on sandstone ridges and subdivision of larger holdings for hunting ranches. Erath County is also subject to exploration and development of the Barnett Shale gas field.

#### Literature Cited

Peppers, K. C. 2004. Old-Growth Forests in the Western Cross Timbers of Texas. Ph.D. Dissertation, Dept. of Biology, University of Arkansas, Fayetteville, AR. 171 pp.

## St. John Blackland Prairies

CA Type: Terrestrial  
Map #: PS19  
State: TX

Size: 175,129 acres (70,872 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The St. John Blackland Prairies Conservation Area includes portions of southern Fayette, western Colorado, and southern Lavaca counties. The area was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001). The focus of this site is interior coastal prairie on clayey soils underlain by the Fleming and Willis formations. This prairie may potentially represent a good example of the Southern Blackland Tallgrass Prairie ecological system, but additional groundtruthing is needed.

## Sulphur River Floodplain

CA Type: Terrestrial  
Map #: PS02  
State: TX

Size: 82,715 acres (33,474 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Sulphur River Floodplain Conservation Area, as the name suggests, captures significant stretches of bottomland hardwood forest along the Sulphur River in Delta, Franklin, Red River, Morris, and Bowie counties. The area was identified using satellite imagery, soils information, and National Land Cover Data (NLCD 1992 and 2001).

The Sulphur River is under constant scrutiny for new reservoir development. The proposed Marvin Nichols Reservoir would permanently flood more than 62,000 acres of land and significantly alter natural flow regimes, with negative consequences for both riparian and aquatic habitat.

## Trinity River Floodplain

CA Type: Terrestrial

Map #: PS07

State: TX

Size: 53,737 acres (21,746 hectares)

Stratification Unit: Post Oak Savanna

### DESCRIPTION

The Trinity River Floodplain Conservation Area, as its names suggests, encompasses a stretch of floodplain forest along the Trinity River in Navarro and Henderson counties. Though it is large compared to some other floodplain forest patches in the ecoregion, the forest probably does not reach its historic dimensions because of conversion of floodplain to agriculture and changes in flooding regimes. This conservation area connects upstream to the Great Trinity Floodplain Forest Conservation Area and downstream to the Middle Trinity Conservation Area.

## White Oak Creek

CA Type: Terrestrial  
Map #: PS03  
State: TX

Size: 41,458 acres (16,777 hectares)  
Stratification Unit: Post Oak Savanna

### DESCRIPTION

The White Oak Creek Conservation Area is found within Hopkins, Franklin, Titus, and Morris counties. Identified using satellite imagery, National Land Cover Data (NLCD 1992 and 2001), and soils information, this area is designed to capture remaining stretches of bottomland hardwood forest along White Oak Creek. Most of the conservation area actually lies outside of the ecoregion, in the Upper West Gulf Coastal Plain Ecoregion (UWGCP), and represents an extension of the floodplain forest captured within the White Oak Creek CA from the UWGCP portfolio. Part of the White Oak Creek Wildlife Management Area is found within this conservation area.

## Wichita County

CA Type: Terrestrial  
Map #: WT08  
State: TX

Size: 14,839 acres (6,005 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Wichita County Conservation Area is located in north-central Wichita County. This site encompasses several documented occurrences of Texas kangaroo rat (*Dipodomys elator*, G2). This species has a very restricted geographic range, and generally prefers clay soils with sparse, short grasses and small, scattered mesquite bushes (Schmidly 2004).

#### Literature Cited

Schmidly, 2004. The Mammals of Texas. University of Texas Press, Austin.

## Wise County Crosstimbers North

CA Type: Terrestrial  
Map #: WT15  
State: TX

Size: 174,888 acres (70,775 hectares)  
Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Wise County Crosstimbers North Conservation Area is located primarily in Wise County, but also extends into southern Montague County. The site lies within the Grand Prairie subregion, and was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001). The area can be generally characterized as a mollisol/alfisol mosaic of crosstimbers woodland/forest and prairie.

A significant portion of the conservation is public land, falling within the boundaries of the Lyndon B. Johnson National Grassland. The LBJ National Grassland, administered by the U.S. Forest Service, actually consists of multiple unconnected tracts (totalling approximately 20,315 acres). The United States Department of the Interior purchased these tracts in the 1930s, under the Bankhead-Jones Farm Tenant Act, with the intention of restoring some of the badly eroded land (Handbook of Texas Online 2008). A number of rarer plant species have been documented from LBJ National Grassland, including Topeka purple-coneflower (*Echinacea atrorubens*, G3), Osage Plains foxglove (*Agalinis densiflora*, G3), Engelmann's bladderpod (*Lesquerella engelmannii* ssp. *engelmannii*, G4T3<sup>1</sup>), and Hall's bulrush (*Schoenoplectus hallii*, G3).

Threats in this conservation area are low. The USDA Forest Service employs fire management on this site. A 380-acre area of the national grassland has been set aside for scientific research and strict protection as the Cross Timbers Research Natural Area.

<sup>1</sup>*Lesquerella engelmannii* ssp. *engelmannii* is not currently recognized by NatureServe. The GRANK listed in this description is based on the recommendation from Bill Carr, a botanist with The Nature Conservancy.

#### Literature Cited

Handbook of Texas Online. < <http://www.tshaonline.org/handbook/online/articles/LL/gkl23.html>>. Accessed January 2008.

## Wise County Crosstimbers South

CA Type: Terrestrial  
Map #: WT17  
State: TX

Size: 80,431 acres (32,549 hectares)

Stratification Unit: Western Tallgrass and Crosstimbers

### DESCRIPTION

The Wise County Crosstimbers South Conservation Area, located on the western edge of the ecoregion and primarily in southern Wise County, was identified using satellite imagery and National Land Cover Data (NLCD 1992 and 2001). Alfisols (Udic Paleustalfs and Ultic Haplustalfs) are the dominant soil order. Soils are based on residuum from weathered sandstone and sandy and loamy alluvium. This area is expected to be predominantly Crosstimbers Oak Forest and Woodland. Predictive modeling by Peppers (2004) indicates that there may be some small remnants of old-growth crosstimbers in the southern portion of the site.

The threats for this area will be primarily subdivision of larger holdings for recreational use. Nearby Lake Bridgeport has attracted weekend landownership.

#### Literature Cited

Peppers, K. C. 2004. Old-Growth Forests in the Western Cross Timbers of Texas. Ph.D. Dissertation, Dept. of Biology, University of Arkansas, Fayetteville, AR. 171 pp.

## Woodfin/Tridens Prairie

CA Type: Terrestrial  
Map #: NC35  
State: TX

Size: 64,723 acres (26,192 hectares)

Stratification Unit: Northern Crosstimbers, Northern Blackland Prairie

### DESCRIPTION

The Woodfin/Tridens Prairie Conservation Area, located in Lamar County, encompasses several prairie remnants of the Silveus' dropseed - longspike tridens (*Sporobolus silveanus* - *Tridens strictus*, G2) type. This community occurs only within a few counties in North Texas and is one of the least conserved plant communities in the state. Dropseed -tridens prairies tend to have high species richness, especially grass and forb species.

Notably, this conservation area contains the largest Blackland Prairie remnant in North Texas: the Smiley-Woodfin Meadow. Most of the acreage of this remnant is contiguous. The meadow has been harvested for hay by the same family for approximately 130 years. It is well known within and beyond the community. The nearby Tridens Prairie (97 acres) is held by The Nature Conservancy; acquired in 1972, it is one of the oldest TNC preserves in Texas. The Gambill Goose Refuge, owned by the City of Paris, includes a comparable amount of Silveus' dropseed - longspike tridens prairie (approximately 100 acres). Other small prairie remnants, ranging from 10-130 acres, are scattered throughout the conservation area. Some opportunities may exist to improve connectivity and reduce fragmentation by riparian corridor restoration.

Prairie remnants in this area should be a priority for conservation action within the ecoregion. Protection of the Smiley-Woodfin Meadow is a priority action within this site. An inventory of prairie sites conducted by Matt White for NPAT in 2007 found about fifteen remnants in the area, including some of high quality.

The key threat within the site is subdivision and development. The city of Paris is growing westward and a vanguard of dense residential construction is developing within the immediate vicinity. Six residences were built immediately east of Tridens Prairie Preserve within the past 15 years. As a result, fire management has become difficult. Other threats include infrastructure development associated with electric distribution lines and an oil pipeline.