



# TEXAS CONSERVATION ACTION PLAN

## Central Great Plains

### DRAFT ECOREGION HANDBOOK

JUNE 2011

Note: text in red in this document will be revised between June 10 Public Comment Draft and the final USFWS-approved document. THIS IS A SUMMARY of the HANDBOOK; more background information will be added.

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See links on Texas Parks and Wildlife Department’s [Texas Conservation Action Plan 2011 Website](#) for additional references and supporting documents cited in this handbook.

*“Action that grows out of urgency, frustration, or even determination is missing a critical ingredient. For action to be effective, for action to be meaningful, it must also grow out of respect and a deep sense of connection to the things and people that surround us.” – Orion Magazine Editors, March/April 2011*

## SUMMARY

The Central Great Plains (CGPL) Handbook is one of the Texas Conservation Action Plan (TCAP) thirteen handbooks, available on the Texas Parks and Wildlife Department’s [Texas Conservation Action Plan website](#):

- an **Overview** – background information about how this Plan came about and was revised;
- a **Statewide/Multi-region handbook** – broad resource concerns and opportunities; and
- 10 other ecoregion handbooks like this one for different areas of Texas with more local information.

This handbook provides insight into specific CGPL resources and conservation issues, including a list of Species of Greatest Conservation Need (SGCN), rare communities, and important habitats that support these unique features. The CGPL handbook also presents a compiled list of issues – things that prevent us from doing our best conservation work here – and proposed solutions or actions. Throughout this document, there are resources – web links, programs, incentives, and contacts – to help you participate in implementation and learn more about the natural resources this region of Texas has to offer.

**The TCAP CGPL Ecoregion Handbook takes advantage of many different perspectives to understand local changes and identify actions that will reduce threats to specific natural resources: SGCN, rare communities and the habitats on which they rely.** The Plan aims to ensure that we are able to share our natural heritage with future generations of Texans and that they understand what we did to make *progress* toward that goal.

It’s important to prioritize where we need to work to the degree that we can: human and financial resources are limited, certain issues demand more immediate resolution, and some species and habitats are simply more in need. The TCAP 2011 taps into a broad network of conservation service providers, natural resources managers, alliances and working groups, policy makers, stakeholders and the public to define **what’s at risk, what issues are most important, where we need to work, how to best engage the right partners to solve the problems, and what to do.**

This handbook is divided into sections to guide priority setting and actions:

- resources at risk - SGCN, rare communities, and the habitats on which they rely;
- issues that are most important, which could benefit from targeted stakeholder involvement; and
- conservation actions to benefit resources and make progress toward solving issues.

Certain resources also have a statewide context – riparian areas, grasslands – and additional actions at that level are proposed in the Statewide/Multi-region handbook. For more information about how content was developed for all handbooks of the Action Plan, please see the Overview handbook.

## HOW TO GET INVOLVED

This handbook contains a list of partners and programs that provide conservation services and/or information in this area. Additionally, certain conservation actions at the end of this handbook may help you connect with partners working on specific issues.

There are many wonderful, energetic public and private conservation providers in Texas who have active volunteer networks, strategic needs, and programs. For more information, check the *Natural Resource Conservation Programs and Services for Texas Landowners*.<sup>1</sup>

If you have questions about the TCAP content and cannot find what you need on the TPWD TCAP 2011 website or in one of the handbooks, please contact the TCAP Coordinator at the TPWD Headquarters in Austin, Texas:

Phone (512) 389-4800

Email [Texas Conservation Action Plan Coordinator](#)

NOTE this email link for questions and implementation participation will be live AFTER the Public Comment period to ensure that we get all public comment through the posted survey on the

[Texas Conservation Action Plan website](#)

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<sup>1</sup> Texas Parks and Wildlife Department. 2007.

[http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_bk\\_w7000\\_1198.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_1198.pdf)

## OVERVIEW

Extending from central Nebraska to its southmost reaches into Texas, the Central Great Plains (CGPL) were once a vast expanse of mixed grasslands, supporting large herds of bison, pronghorn, and other species dependent on the transitional mix from eastern tallgrass prairie to western shortgrass prairie. Southern extents in Texas supported scattered mottes of oak and mesquite savanna, shrublands, and transitional vegetation communities into the Cross Timbers to the east. In Texas, this ecoregion covers approximately 11,566,646 acres.

The CGPL forms a shallow “trough” of mixed grasslands dependent on precipitation gradients between the High Plains and Southwestern Tablelands to the west, the more rugged topography of the Cross Timbers to the east, and the Edwards Plateau to the south. Erosion by the Brazos and Colorado rivers has removed the overlying Cretaceous limestones to expose 250 million year old Permian sedimentary rocks. These colorful rocks and soils erode easily and tint the rivers red with sediment throughout the prairie regions. Rivers and streams are more intermittent in western extents and frequently braided throughout the region; riparian vegetation is more dense and shrubby. Eastern woodland riparian extents (where intact) support eastern forest and woodland bird species occurrences into their western extents. Today, shrub and woodland increase on uplands has decreased the grassland suitability for a great number of typical Great Plains bird, small mammal, and reptile assemblages.

While open understory, mature mesquite groves (savanna) were prevalent along stream courses and in grassland swales in the early and mid-19<sup>th</sup> century, mesquite thickets are now widespread in uplands throughout the region and a conservation management issue. Its success in certain areas is attributed to fire suppression, intense grazing pressure, early cattle drives, and the change in land management after the widespread use of barbed wire and water development. Prairie dog “towns” with cohabitation for burrowing owl, black-footed ferret, swift fox, and various prairie snakes and lizards were once ecological drivers in the region, supporting each other, and badgers, mountain plovers, ferruginous and Swainson’s hawks. Schmidly notes that colonies once covered tens of thousands of square miles of prairie throughout Texas and ranged as far east as the Cross Timbers. Prairie dogs were seen as the “colony glue” and ranchers wanting to eliminate competition for grazing livestock began large-scale eradication efforts of prairie dogs in the 20<sup>th</sup> century. Loss of prairie dogs and their cohorts and the function they serve in the grassland system, along with fire suppression and inappropriate stocking rates, has contributed to the brush invasion.<sup>2</sup>

A satellite view of the CGPL reveals a dense patchwork of dryland and irrigated cotton, wheat, and grain sorghum agricultural lands; dissected shallow canyons or “breaks;” and open livestock range for cattle, sheep and goats. The eastern boundary of the ecoregion marks the eastern limits of the major winter wheat growing area of the United States. Soils in this region are generally deep with shallow soils on ridges and breaks. Oil, gas and coal production along with gypsum mined from the Whitehorse Formation are industrial drivers in the area. Wichita Falls, Abilene, San Angelo, Brownwood and Brady are the largest developed areas in this ecoregion.

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<sup>2</sup> Griffith, G. 2010. Level III North American Terrestrial Ecoregions: United States Descriptions. Prepared for the North American Commission for Environmental Cooperation ([www.cec.org](http://www.cec.org)), version May 11, 2010. Corvallis, Oregon.

Griffith, G.E., S.A. Bryce, J.M. Omernik, J.A. Comstock, A.C. Rogers, B. Harrison, S.L. Hatch and D. Bezanson. 2007. Ecoregions of Texas. R.S. Geological Survey, Reston VA. [http://www.epa.gov/wed/pages/ecoregions/tx\\_eco.htm](http://www.epa.gov/wed/pages/ecoregions/tx_eco.htm) (accessed May 2009).

**Table 1** crosswalks this ecoregion with other conservation planning units.<sup>3</sup>

**Figure 1** illustrates the location and extent of this ecoregion in Texas.

**Table 2** documents the **Ecological Drainage Units** (EDU) and **Hydrologic Units** (“HUC 8”, finer scale watersheds within EDUs), **Ecologically Significant Stream Segments** (ESSS)<sup>4</sup>

**Figure 2** shows those EDUs, stream segments and reservoirs by ecoregion.

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<sup>3</sup> For more information about planning boundaries, see the Overview handbook on the TCAP 2011 website  
<http://www.tpwd.state.tx.us/landwater/land/tcap/>

<sup>4</sup> Esselman, P.C., D.M. Infante, L. Wang, D. Wu, A. Cooper, and W.W. Taylor. 2010. An initial assessment of relative landscape disturbance levels for river fish habitats of the conterminous United States.  
[http://www.nbii.gov/far/nfhap/data/NFHAP\\_Initial\\_Assessment\\_Report\\_Esselman\\_etal\\_2010.pdf](http://www.nbii.gov/far/nfhap/data/NFHAP_Initial_Assessment_Report_Esselman_etal_2010.pdf) (accessed 2010 – 2011).

TPWD. 2002/2005. *Ecologically Significant Stream Segments*.

[http://www.tpwd.state.tx.us/landwater/water/environconcerns/water\\_quality/sigsegs/](http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/sigsegs/)

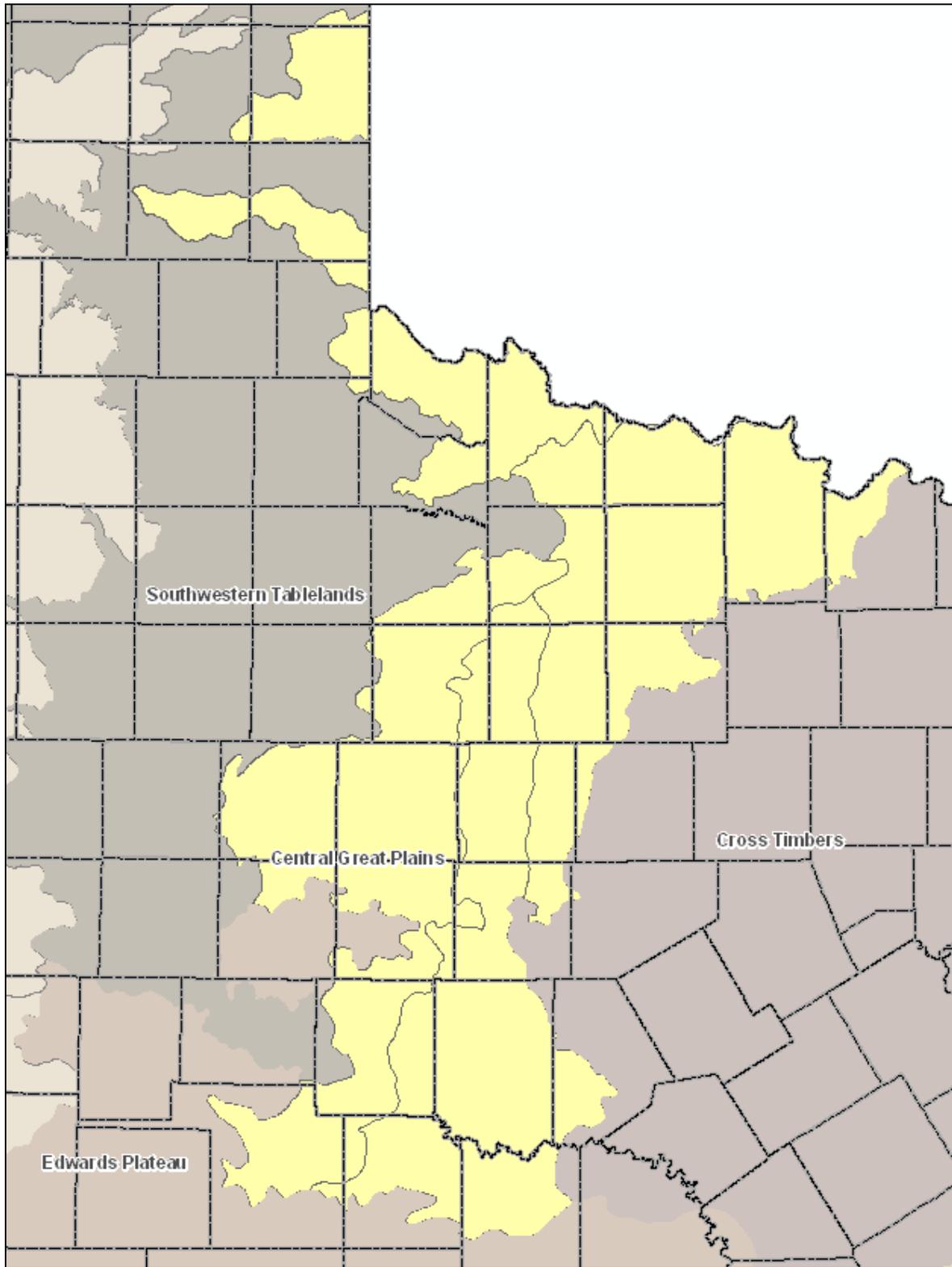
**Table 1. Crosswalk of CGPL Ecoregion with Other Conservation Plan Units**

Note Table is formatted 8-1/2" x 11" landscape orientation; see also Ecoregions map on TCAP 2011 website.

2011 TCAP	2005 TXWAP Gould 1960	The Nature Conservancy Terrestrial Ecoregions 1999	Ecological Drainage Units (Watersheds) National Fish Habitat Action Plan <i>TX = Southeast Aquatic Resources Partnership and Desert Fish Habitat Partnership</i> AFWA 2006 Fish Habitat Partnership 2009 Esselman et.al. 2010	All Bird Joint Ventures (JV) and Bird Conservation Regions (BCR) NABSCI-US 2004, USFWS 2009a	Landscape Conservation Cooperatives (LCC) USFWS 2009b	2010 TPWD Land & Water Plan Strategic Regions TPWD 2010	Major Land Resource Regions and Areas (MLRA) NRCS 2006	Natural Regions of Texas LBJ School of Public Policy 1978
Central Great Plains (CGPL)	part of Cross Timbers and Prairies and part of Rolling Plains	Southern Shortgrass Prairie (28) and Central Mixed Grass Prairie (33)	Brazos River – Prairie Colorado River – Ed Plateau Upper Red River Upper Trinity	Playa Lakes JV Central Mixed Grass Prairie BCR	Great Plains	Colorado Upper (5a) Brazos Upper (6a) Plains Rivers (10)	Central Great Plains Winter Wheat and Range Region: <i>Rolling Limestone Prairie (78A), Central Red Rolling Plains Eastern and Western (78C and B), Central Red Rolling Prairies (80A), Texas North Central Prairies(80B)</i> Southwest Plateaus and Plains Range and Cotton Region: <i>Edwards Plateau Central (81B)</i>	Rolling Plains

**Figure 1. CGPL Ecoregion with County Boundaries**

Central Great Plains ecoregion in yellow



**Table 2. CGPL EDUs with Ecologically Significant Stream Segments and Reservoirs**

<b>ECOLOGICAL DRAINAGE UNIT SubBasin (HUC 8)</b>	<i>Ecologically Significant Stream Segment TPWD 2002, w/updates 2005</i>	<b>Lakes and Reservoirs</b>
<b>UPPER RED RIVER</b>		
Washita Headwaters		
Middle North Fork Red	Sweetwater Creek	
Upper Salt Fork Red	Leila Lake Creek	Greenbelt Lake
Lower Prairie Dog Town Fork Red	Prairie Dog Town Fork Red River	
Elm Fork Red		
Lower Salt Fork Red		
Groesbeck - Sandy	Red River	Lake Pauline
Pease	Pease River	
Southern Beaver		Santa Rosa Lake, Lake Electra
North Wichita		
South Wichita		
Wichita		Lake Diversion, North Fork Buffalo Creek Reservoir
Blue-China	Red River	
Little Wichita		Lake Kickapoo, Lake Arrowhead, Lake Olney-Cooper
Farmers - Mud		
<b>UPPER TRINITY</b>		
Upper West Fork Trinity		
<b>BRAZOS RIVER - PRAIRIE</b>		
Middle Brazos - Millers	Brazos River	Millers Creek Reservoir
Upper Clear Fork Brazos		Lake Sweetwater, Lake Kirby, Lake Fort Phantom Hill
Double Mountain Fork Brazos	Double Mountain Fork Brazos	
Paint		Lake Stamford
Lower Clear Fork Brazos		
Hubbard		Hubbard Creek Reservoir
Middle Brazos - Palo Pinto		Lake Graham/Lake Eddleman

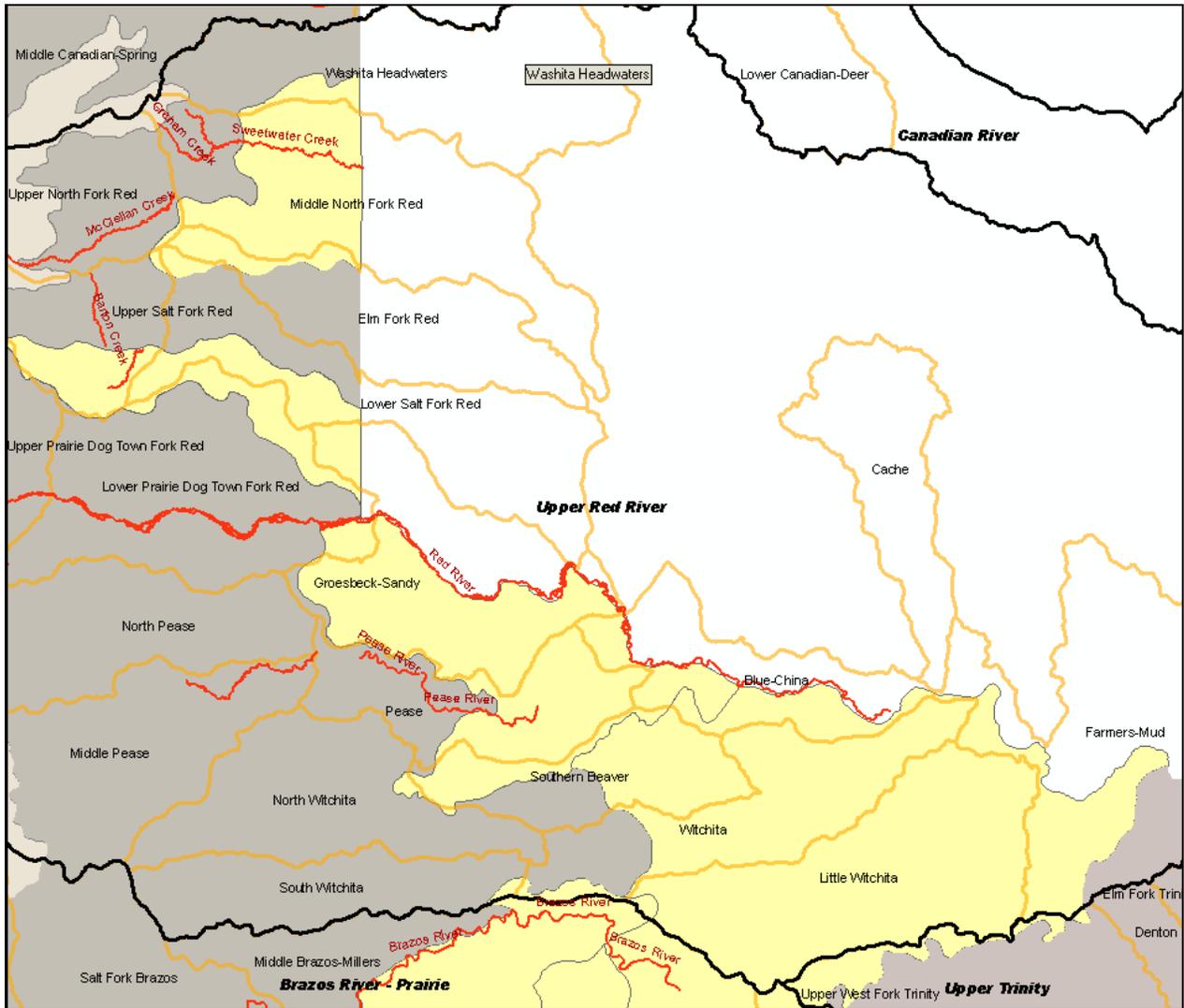
Table 2. *continued*

<b>ECOLOGICAL DRAINAGE UNIT SubBasin (HUC 8)</b>	<b>Ecologically Significant Stream Segment TPWD 2002, w/updates 2005</b>	<b>Lakes and Reservoirs</b>
<b>COLORADO RIVER - EDWARDS PLATEAU</b>		
Middle Colorado - Elm	Elm Creek, Colorado River	Lake Ballinger/Lake Moonen, Lake Winters/New Lake Winters, O.H. Ivie Reservoir
Middle Concho		Twin Buttes Reservoir
North Concho	Concho River	O.C. Fisher Reservoir
Concho	Concho River	O.H. Ivie Reservoir
South Concho	Concho River	Twin Buttes Reservoir, Lake Nasworthy
Middle Colorado	Colorado River	O.H. Ivie Reservoir
Jim Ned		Lake Coleman
Pecan Bayou		Lake Clyde, Lake Brownwood
Brady		Brady Creek Reservoir

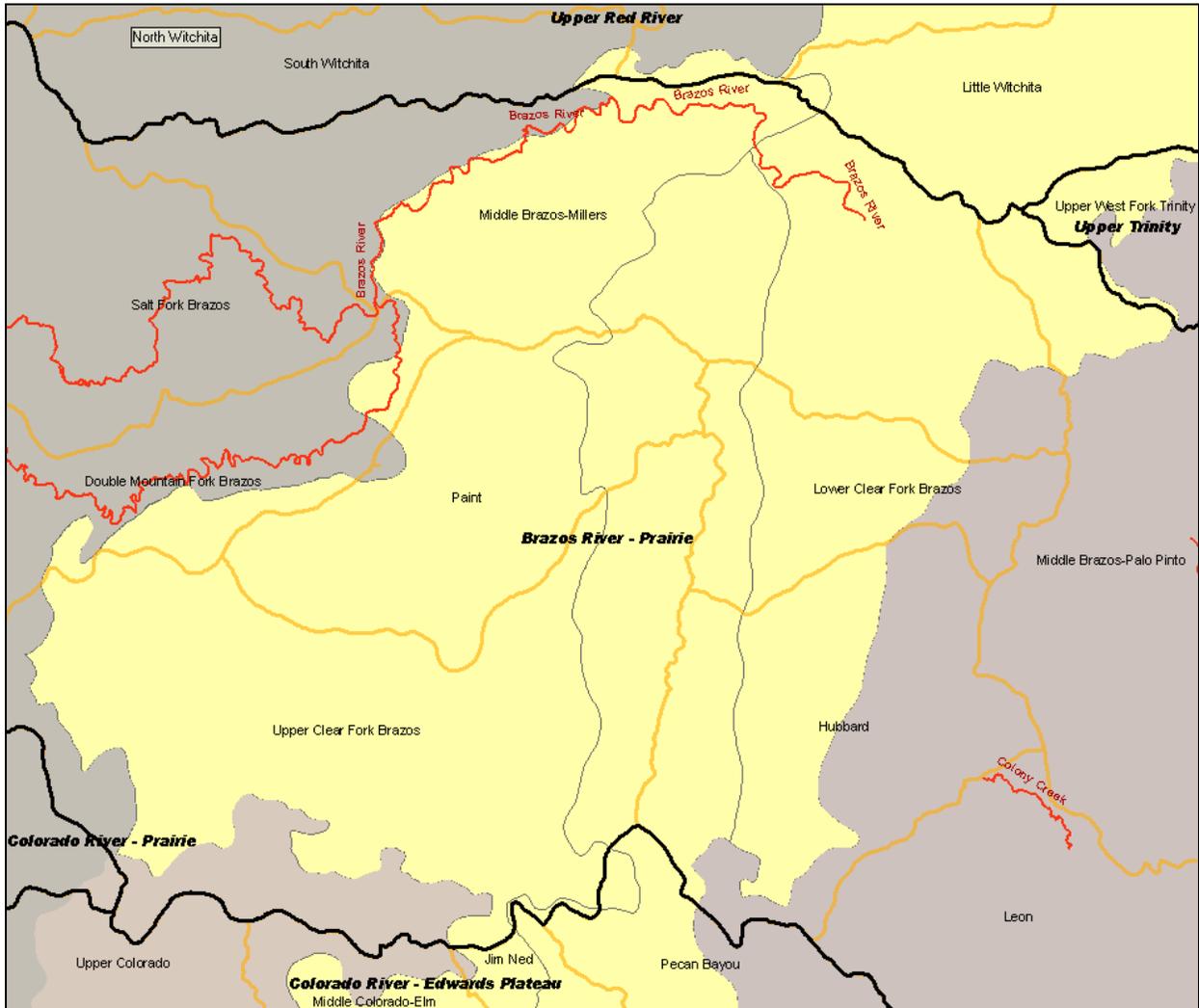
NOTE: Ecologically Significant Stream Segments and Lakes/Reservoirs which occur in the Subbasin (HUC 8, watershed) BUT NOT IN THE ECOREGION, are NOT included in this table.

**Figure 2. CGPL EDU, HUC 8s, and ESSS – 3 maps**

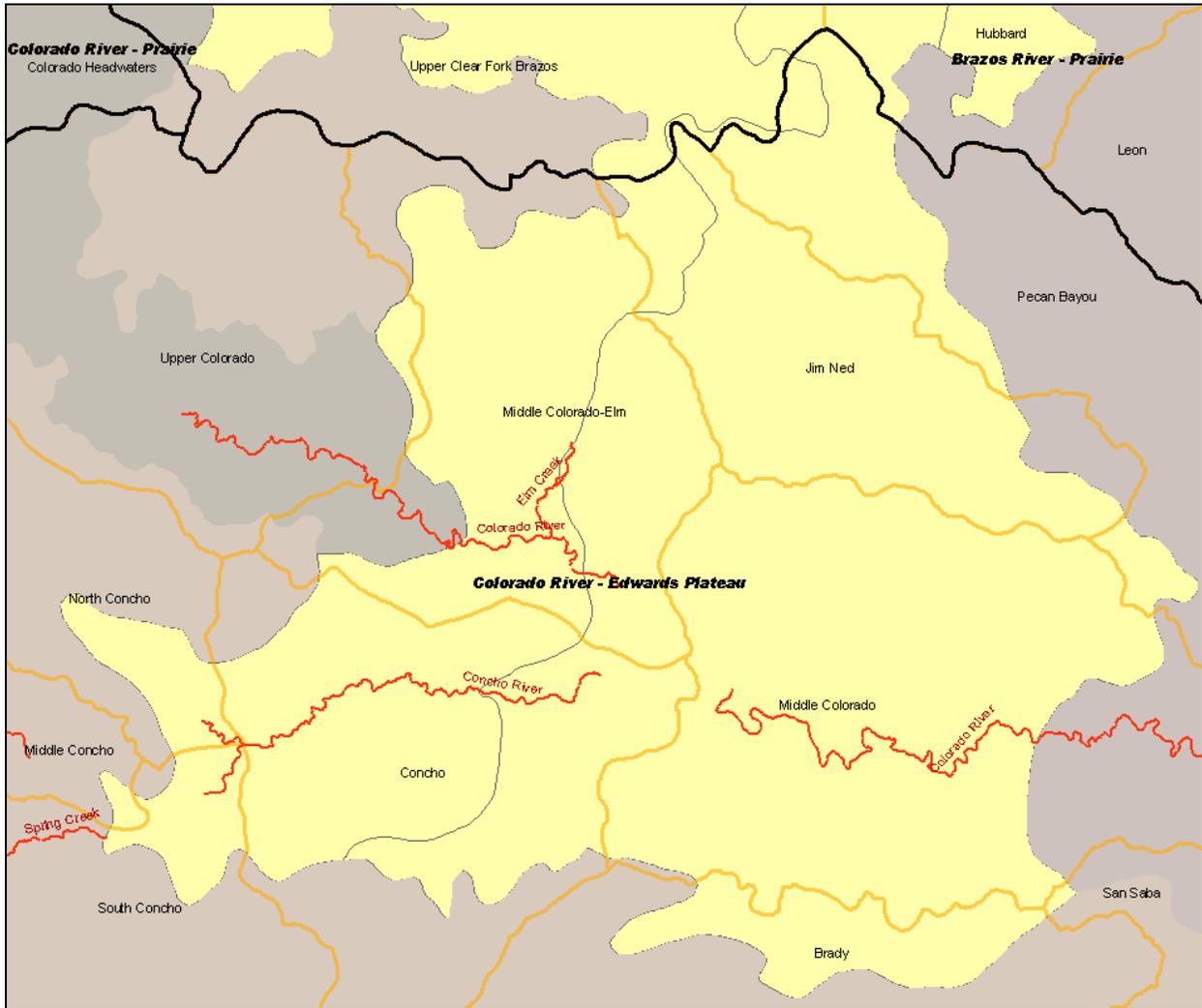
Upper Red River EDU black boundary, HUC 8 orange boundary, and ESSS red lines



Brazos River - Prairie EDU black boundary, HUC 8 orange boundary, ESSS red lines



Colorado River – Edwards Plateau EDU black boundary, HUC 8 orange boundary, ESSS red lines



Note: other important stream segments may be mentioned in the Priority Habitats section

## RARE SPECIES AND COMMUNITIES

While most conservation work is done at the habitat level to address issues and threats, Action Plans' [stated primary purpose](#) is to improve and sustain *species'* populations and prevent the need to list species as federally or state threatened or endangered. The Species of Greatest Conservation Need (SGCN) list, one of the Eight Required Elements in all states' Action Plans, is the foundation for the habitat- and issues- based actions in the Plan. In Texas, we've also identified Rare Communities for this planning process.

For more information about how the SGCN and Rare Communities lists were developed, including the changes from the 2005 list, see the [Overview Handbook](#). Species and rare communities included in the [2011 TCAP Final SGCN](#) and [Rare Communities](#) lists are supported by current science, peer-reviewed references and/or other dependable, accessible source documentation, and expert opinion. The revised lists for TCAP 2011 are substantial and representative of conservation targets needing attention in this Plan and are sorted into the following categories:

Mammals	Birds
Reptiles and Amphibians	Freshwater Fishes
Invertebrates	Plants
Plant Communities	

Table 3 shows the SGCN for this ecoregion. No rare communities were noted as KNOWN TO OCCUR in this ecoregion specifically; however, there may be few rare plant communities known from adjacent ecoregions which may be considered rare in this region if found to occur:

- Eastern Great Plains Saline Marsh
- Oklahoma Bladderpod Glade
- Central Great Plains Little Bluestem Prairie
- Western Gypsum and Redbed Clay Prairie
- Vertisol Blackland Prairie
- Eastern Gammagrass - Tall Dropseed Herbaceous Vegetation

Other categories are listed on the full statewide list, but are not applicable in this ecoregion: Bay and Estuary Fishes, Marine Fishes, Marine Reptiles, and Marine Mammals

Each species has a [NatureServe](#) calculated state and global [conservation rank](#), which accounts for abundance, stability and threats. Additionally, several species have [federal](#) and/or [state](#) listing (endangered, threatened, candidate) status. See the [key to conservation and listing ranks](#) on the [TPWD TCAP 2011 website](#).

**Table 3. CGPL Species of Greatest Conservation Need (SGCN)**

Note Table is formatted 8-1/2" x 11" portrait orientation;

More information is available in the SGCN table online.

Scientific Name	Common Name	Status		Abundance Ranking	
		Federal	State	Global	State
<b>MAMMALS</b>					
<i>Antilocapra americana</i>	Pronghorn			G5	S3
<i>Antrozous pallidus</i>	Pallid bat			G5	S5
<i>Conepatus leuconotus</i>	Hog-nosed skunk			G5	S4
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat			G4T4	S3? S4?
<i>Cratogeomys castanops</i>	Yellow-faced pocket gopher			G5	S5
<i>Cynomys ludovicianus</i>	Black-tailed prairie dog			G5T3	S3
<i>Dipodomys elator</i>	Texas kangaroo rat		T	G1G2	S2
<i>Lutra canadensis</i>	River otter			G5	S4
<i>Mustela frenata</i>	Long-tailed weasel			G5	S5
<i>Mustela nigripes</i>	Black-footed ferret	LE		G1	SH
<i>Neovison vison</i>	Mink			G5	S4
<i>Myotis velifer</i>	Cave myotis			G5	S4
<i>Nyctinomops macrotis</i>	Big free-tailed bat			G5	S3
<i>Puma concolor</i>	Mountain lion			G5	S2
<i>Spilogale gracilis</i>	Western spotted skunk			G5	S5
<i>Spilogale putorius</i>	Eastern spotted skunk			G4T	S4
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat			G5	S5
<i>Taxidea taxus</i>	American badger			G5	S5
<i>Vulpes velox</i>	Swift fox			G3	S3?
<b>BIRDS</b>					
<i>Anas acuta</i>	Northern Pintail			G5	S3B,S5N
<i>Callipepla squamata</i>	Scaled Quail			G5	S4B
<i>Colinus virginianus</i>	Northern Bobwhite			G5	S4B
<i>Tympanuchus pallidicinctus</i>	Lesser Prairie-Chicken	C2		G3	S2B
<i>Meleagris gallopavo</i>	Wild Turkey			G5	S5B
<i>Ictinia mississippiensis</i>	Mississippi Kite			G5	S4B
<i>Haliaeetus leucocephalus</i>	Bald Eagle			G5	S3B,S3N
<i>Circus cyaneus</i>	Northern Harrier			G5	S2B,S3N
<i>Buteo swainsoni</i>	Swainson's Hawk			G5	S4B
<i>Buteo regalis</i>	Ferruginous Hawk			G4	S2B,S4N
<i>Aquila chrysaetos</i>	Golden Eagle			G5	S3B
<i>Pluvialis dominica</i>	American Golden-Plover			G5	S3

Scientific Name	Common Name	Status		Abundance Ranking	
		Federal	State	Global	State
<i>Sternula antillarum</i>	Least Tern	LE*	E*	G4	S3B
<i>Athene cunicularia</i>	Burrowing Owl			G4	S3B
<i>Asio flammeus</i>	Short-eared Owl			G5	S4N
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow			G5	S3S4B
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker			G5	S3B
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher			G5	S3B
<i>Lanius ludovicianus</i>	Loggerhead Shrike			G4	S4B
<i>Vireo atricapilla</i>	Black-capped Vireo	LE	E	G3	S2B
<i>Poecile carolinensis</i>	Carolina Chickadee			G5	S5B
<i>Anthus spragueii</i>	Sprague's Pipit	C		G4	S3N
<i>Aimophila cassinii</i>	Cassin's Sparrow			G5	S4B
<i>Aimophila ruficeps</i>	Rufous-crowned Sparrow			G5	S4B
<i>Spizella pusilla</i>	Field Sparrow			G5	S5B
<i>Ammodramus savannarum</i>	Grasshopper Sparrow			G5	S3B
<i>Chondestes grammacus</i>	Lark Sparrow			G5	S4B
<i>Zonotrichia querula</i>	Harris's Sparrow			G5	S4
<i>Calcarius mccownii</i>	McCown's Longspur			G4	S4
<i>Piranga rubra</i>	Summer Tanager			G5	S5B
<i>Passerina ciris</i>	Painted Bunting			G5	S4B
<i>Spiza americana</i>	Dickcissel			G5	S4B
<i>Sturnella magna</i>	Eastern Meadowlark			G5	S5B
<i>Icterus spurius</i>	Orchard Oriole			G5	S4B
<b>REPTILES AND AMPHIBIANS</b>					
<i>Anaxyrus (Bufo) woodhousii</i>	Woodhouse's toad			G5	SU
<i>Apalone mutica</i>	smooth softshell turtle				
<i>Apalone spinifera</i>	spiny softshell turtle				
<i>Cheilydra serpentina</i>	Common snapping turtle				
<i>Crotalus atrox</i>	Western diamondback rattlesnake				S4
<i>Graptemys versa</i>	Texas map turtle			G4	SU
<i>Heterodon nasicus</i>	Western hognosed snake				
<i>Macrochelys temminckii</i>	alligator snapping turtle		T	G3G4	S3
<i>Nerodia harteri</i>	Brazos Water Snake		T		S1
<i>Nerodia paucimaculata</i>	Concho water snake	LT-PDL		G2	S2
<i>Ophisaurus attenuatus</i>	western slender glass lizard				
<i>Phrynosoma cornutum</i>	Texas horned lizard		T	G4G5	S4

Scientific Name	Common Name	Status		Abundance Ranking	
		Federal	State	Global	State
<i>Sistrurus catenatus</i>	massasagua				
<i>Terrapene ornata</i>	Ornate box turtle			G5	S3
<i>Thamnophis sirtalis</i>	Common Garter Snake (Eastern/Texas/ New Mexico)			G5	S2
<i>Trachemys scripta</i>	Red-eared slider				
FRESHWATER FISHES					
<i>Anguilla rostrata</i>	American eel			G4	S5
<i>Cyprinodon rubrofluviatilis</i>	Red River pupfish				
<i>Ictalurus lupus</i>	Headwater catfish			G3	S2
<i>Macrhybopsis australis</i>	Prairie chub				
<i>Macrhybopsis storeriana</i>	Silver chub				
<i>Notropis bairdi</i>	Red River shiner				
<i>Notropis oxyrhynchus</i>	Sharpnose shiner	C		G3	S3
<i>Notropis potteri</i>	Chub shiner		T	G4	S3
INVERTEBRATES					
<i>Bombus pensylvanicus</i>	American bumblebee			GU	SU*
<i>Islandiana unicornis</i>	A cave obligate spider			G2G3	S2*
<i>Lampsilis bracteata</i>	Texas fatmucket		T	G1	S1*
<i>Pogonomyrmex comanche</i>	Comanche harvester ant			G2G3*	S2*
<i>Protandrena maurula</i>	A mining bee			G1G2*	S1S2*
<i>Quadrula petrina</i>	Texas pimpleback		T	G2	S1*
PLANTS					
<i>Agalinis densiflora</i>	Osage Plains false foxglove			G3	S2
<i>Argythamnia aphoroides</i>	Hill Country wild-mercury			G2G3	S2S3
<i>Chamaesyce jejuna</i>	dwarf broomspurge			G2	S2
<i>Echinocereus reichenbachii</i> <i>subsp. baileyi</i>	Bailey's hedgehog cactus			G5T3	S1
<i>Eriogonum correllii</i>	Correll's wild-buckwheat			G2G3	S2S3
<i>Eriogonum nealleyi</i>	Irion County wild-buckwheat			G2	S2
<i>Penstemon triflorus subsp.</i> <i>triflorus</i>	threeflower penstemon			G3T3	S3
<i>Physaria engelmannii</i>	Engelmann's bladderpod			G3	S3
<i>Selenia jonesii</i>	Jones' selenia			G3	S3
<i>Solidago mollis var. angustata</i>	Rolling Plains goldenrod			G5T3	S2
<i>Vitis rupestris</i>	rock grape			G3	S3

## PRIORITY HABITATS

Nationally, an SGCN list forms a basis for every Action Plan; however, *species* conservation cannot be successful without defining the *lands and waters species need to survive and thrive*. If it was only important to know about individuals or even populations, we could put representatives in zoos or herbaria or other curated collections and that would be enough; but, it's not .... **It's important to conserve populations in the *context* in which they thrive, to the best of *their* abilities, where they can contribute to and benefit from the systems in which they live.**

[Broad habitat categories](#) were developed to organize all ecoregional handbooks.

See also the Statewide/Multi-region handbook for habitats that are of broader importance – shared with many other regions and/or other states or nations (e.g. riparian or migratory species' habitats as a general category).

See also [Ecoregions of Texas](#) (report is near the bottom of webpage; Griffith et. al. 2007), [Ecological Mapping Systems Project](#) (TPWD et. al. *in progress*), and the [National Fish Habitat Action Plan](#)

**Table 4. CGPL Priority Habitats**

Note Table is formatted 8-1/2" x 11" landscape orientation

GENERAL HABITAT TYPES	CENTRAL GREAT PLAINS (CGPL)	CGPL Ecological Systems
NATURAL AND SEMI-NATURAL TYPES	<i>Habitats in this column were identified in the workshop; additions were made by editor to riverine and cultural aquatic</i>	<i>NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications for Ecological Systems of Texas' Central Great Plains. NatureServe Central Databases. Arlington, VA. U.S.A. Data current as of 08 October 2009.</i>
Barren/Sparse Vegetation		Western Great Plains Cliff and Outcrop
Grassland	Midgrass prairie Shortgrass prairie	Central Mixedgrass Prairie Western Great Plains Sand Prairie Western Great Plains Shortgrass Prairie
Shrubland	sandhill shrublands	Edwards Plateau Limestone Shrubland Western Great Plains Mesquite Woodland and Shrubland Western Great Plains Sandhill Steppe
Savanna/Open Woodland	mesquite woodlands	Edwards Plateau Limestone Savanna and Woodland
Woodland	Oak woodlands in southern and eastern extents	Crosstimbers Oak Forest and Woodland Edwards Plateau Dry-Mesic Slope Forest and Woodland
Riparian	periodically flooded or subirrigated floodplain shrublands (mesquite, oak), woodlands (oak, juniper) and forest (oak, elm, ... ) associated with Upper Red River and tributaries, upper-middle Brazos River and tributaries, and northeastern-middle Colorado and tributaries midstream gravel bars (periodically scoured clean by floods, periodically vegetated)	Edwards Plateau Floodplain Edwards Plateau Riparian Southeastern Great Plains Floodplain Forest Southeastern Great Plains Riparian Forest Western Great Plains Floodplain Western Great Plains Riparian (mixed upland and wetland)

GENERAL HABITAT TYPES	CENTRAL GREAT PLAINS (CGPL)	CGPL Ecological Systems
Riverine	Instream habitats of the watersheds which intersect this ecoregion (see EDU Workbook) Ecologically Significant Stream Segments - Sweetwater Creek, Leila Lake Creek, Prairie Dog Town Fork Red River, Red River, Pease River, Brazos River, Double Mountain Fork Brazos River, Elm Creek, Colorado River, Concho River	NA
<i>Lacustrine (see Cultural Aquatic)</i>		
Freshwater Wetland	swale grasslands/depressional wetlands	Eastern Great Plains Wet Meadow, Prairie and Marsh Chihuahuan-Sonoran Desert Bottomland and Swale Grassland (mixed upland and wetland)
Saltwater Wetland		NA
Aquifer	Ogalalla (northern section of ecoregion)	NA
Caves/Karst		NA

GENERAL HABITAT TYPES	CENTRAL GREAT PLAINS (CGPL)	CGPL Ecological Systems
CULTURAL TYPES	<i>habitats in this column must support SGCN or rare communities to be considered in this plan</i>	
Agricultural	Open fields, during certain migration periods (for mountain plover)	NA
Developed		NA
<i>Urban, Suburban, Rural</i>		NA
<i>Industrial</i>	mines	NA
<i>Rights of Way</i>		NA
Cultural Aquatic	Reservoirs: Greenbelt Lake, Lake Pauline, Santa Rosa Lake, Lake Electra, Lake Diversion, North Fork Buffalo Creek Reservoir, Lake Kickapoo, Lake Arrowhead, Lake Olney - Cooper, Millers Creek Reservoir, Lake Sweetwater, Lake Kirby, Lake Fort Phantom Hill, Lake Stamford, Hubbard Creek Reservoir, Lake Graham/Eddleman, Lake Ballinger/Moonen, Lake Winters/New Winters, O.H. Ivie Reservoir, Twin Buttes Reservoir, O.C. Fisher, O.H. Ivie, Twin Buttes, Lake Nasworthy, Lake Coleman, Lake Clyde, Lake Brownwood, Brady Creek Reservoir	NA
ARTIFICIAL REFUGIA		
Created mitigation wetlands		NA

Texas shares its border with four states – New Mexico, Oklahoma, Arkansas, and Louisiana. **CGPL** shares a its northern border with Oklahoma. **Table 6** identifies habitat priorities which have been identified in the Oklahoma Wildlife Action Plan which may be potentially adjacent to the CGPL. Other habitat types and at-risk watersheds occur in other ecoregions adjacent to Oklahoma. Every adjacent state’s Action Plan mentions the importance of **intact native riparian zones** and **floodplains, high quality instream habitats, wetlands** of all types, and **native grasslands**. These habitat types are also found in the **CGPL** and are priorities for conservation in this ecoregion. See Statewide/Multi-region handbook for broadscale Conservation Actions for these priorities.

**Table 5. Shared Habitat Priorities with Adjacent State – Oklahoma**

Adjacent States	Ecoregions Shared with Texas	Habitat Priorities Shared with Texas <sup>5</sup>
<a href="#">Oklahoma</a> (OK)	High Plains Southwestern Tablelands Central Great Plain Cross Timbers East Central Texas Plain Western Gulf Coastal Plain	shortgrass prairie playas, springs and other wetlands sand sagebrush/bluestem shrublands mixed grass prairie ephemeral and perennial tributaries and mainstem of the Canadian and Red Rivers, and associated riparian zones and floodplains shinnery oak shrubland tall grass prairie oak woodlands and savanna mesquite savanna TX – OK HUC 8 at moderate risk: Washita Headwaters, Lower North Fork Red, Lower Salt Fork Red, Blue-China, Farmers-Mud

<sup>5</sup> Priorities were determined by reviewing the state’s Action Plan online (Oklahoma Comprehensive Wildlife Conservation Strategy. 2006. <http://www.wildlifedepartment.com/CWCS.htm>) and the National Fish Habitat Risk Assessment Viewer online (NBII and USGS. 2011. [http://fishhabitat.org/index.php?option=com\\_content&view=category&layout=blog&id=42&Itemid=61](http://fishhabitat.org/index.php?option=com_content&view=category&layout=blog&id=42&Itemid=61)).

## ISSUES

There are **activities and conditions** which may negatively affect the SGCN populations, rare communities, and the habitats on which they depend in this region. These issues can include **direct or indirect harm** (e.g. inappropriate mining reclamation which uses non-native vegetation or indirectly provides an opportunity for non-native invasive vegetation, streambed gravel mining that directly removes spawning habitat and/or indirectly creates poor water quality downstream) **plus basic “gaps” that prevent us from acting most effectively** (e.g. lack of information, lack of coordination to share current data, incompatible practices among land managers, lack of funding). For information about how this list was developed, see the Overview Handbook and the [descriptions of the broad issue categories](#).

**Habitat fragmentation and habitat loss, including open-space land conversion**, are always going to be broad issues that need to be addressed, at various scales – local, regional, statewide, interstate, and international. These are such broad categories and, depending on the scale of the problem, these three issues can be symptoms or causes of many other issues. These three issues are not specifically included in the Issues list, although they may be implied in many of the categories presented.

The issues covered in the **CGPL** Ecoregion Handbook attempt to present more of the specific causes of SGCN, rare communities, and habitats’ decline, providing appropriate context to help target our actions, identified later in this handbook. Several of the habitat types in this handbook are also considered priority habitats in the Statewide/Multi-region handbook.

**Table 6. CGPL Priority Issues Affecting Conservation**

Table formatted 11" x 17", landscape orientation

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
Invasive Species		
Non-native Plant	Salt cedar/tamarisk ( <i>Tamarix spp.</i> ) Cultivated and Old World grasses (e.g. Lehmann's lovegrass, King Ranch (KR) bluestem, Bermuda grass)	Salt cedar affects water use, monotypic stands, and outcompetes native riparian vegetation at all seral stages and canopy levels; armors banks and contributes significantly to channel incision and narrowing, which reduces the diversity and quality of habitat for aquatic species Non-native grasses either as improved pastures or naturally expansive are well-established, a substantial threat to grassland-dependent species (e.g. grassland-obligate birds)
Non-native Animal	FERAL HOGS introduced fishes and mollusks - freshwater springs, streams and marshes	Feral hogs also decimate important and fragile habitats (e.g. springs, seeps, riparian areas, swale depressional wetlands), degrade instream water quality Within streams, nonnative species compete with natives, and are a predation risk (e.g. small mouth bass are voracious non-native predators) Bait fish releases ("minnows") can cause problematic congeneric hybridization (e.g. <i>Gambusia sp.</i> )
Native Problematic	Native shrub (e.g. mesquite, shin oak) or "brush" encroachment into grassland systems; mesquite has displaced grasslands especially in areas with subsurface moisture Golden alga (see also <i>Non-native Invasive Species</i> ; it is not conclusively known whether golden alga is native or non-native)	Invasive native brush/trees are a significant threat to grassland-obligate birds: grassland loss decreases habitat availability and quality for grassland nesting birds, trees provide perches for hunting raptors which also decrease grassland bird, small mammal and reptile success Toxic blooms in <b>what water bodies</b> may adversely impact <b>what SGCN specifically</b>
Pests, Parasites, Pathogens		
Pests		
Parasites	Haemonchus	Deadly and devastating parasite to pronghorn, additional stressor on already stressed populations
Pathogens	White-nose Syndrome (WNS)	WNS affects hibernating bats and is spread through human (we think) and bat vectors, through cave visitation. Mortality is high; prevention and overall cause is unknown.
Power Development and Transmission		
Wind Generation	See also full discussion in Statewide Handbook Competitive Renewable Energy Zones (CREZ) wind generation development priority zones: Panhandle B (not well developed in this ecoregion) and Central (several existing developments)	High ridges typically intersect raptor migration corridors (impacts to Golden Eagle, Ferruginous Hawk, Swainson's Hawk, Whooping Crane) Typically impacts vegetation communities that occur on these ridges - grasslands, shrublands -- which causes habitat loss and contributes to invasive species; additionally, tall structures are not well-accepted by many grassland species migratory birds and bats adversely affected through barotrauma and direct collision
Solar or PV (photovoltaic) array siting	level or nearly level sites with high PV potential occur throughout the region	array siting, with the network of maintenance and access roads, impacts shortgrass mesa and other open lowland grassland communities (direct loss and invasive species competition), blocks sun and rain needed for photosynthesis and recovery of vegetation communities; plant and plant community protections are insufficient to trigger environmental compliance in this industry; deep footings may impact karst in certain areas; some may require large quantities of water
Hydro (Dam and Reservoir)	?	<b>see also Water Development, Management and Distribution</b>
Biofuels	Row Crop, Switchgrass, Herbaceous: native rangeland and open grasslands converted to croplands (monotypic stands of switchgrass and others)	Loss of native and open grassland birds' habitats for foraging, nesting, and shelter -- Cassin's Sparrow, Rufous crowned Sparrow, Lark Sparrow, McCowan's Longspur, Dickcissel
Transmission	New development and expansion of existing lines/corridors construction of new power infrastructure corridors to meet urban user needs, from CREZ generation projects in this region to north and central TX loads maintenance and operations maintaining clear right-of-way for vehicle clearance/access, prevention of line and tower danger	While it's rare for most transmission lines to be strike hazards (most strikes are distribution lines), T-lines are a hazard for Whooping Cranes. Corridor directly takes all habitat types and species during construction (loss), degrades adjacent habitat (fragmentation), and may hinder movement (daily or seasonal)

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
Distribution	Development to power grid and retail users: construction of new power infrastructure corridors to meet urban user needs	mowing, trimming (permanent fragmentation, erosion) herbicide application directly takes habitat and species during construction (loss), degrades adjacent habitat (fragmentation), and may hinder movement (daily or seasonal)
Oil and Natural Gas Production and Delivery		
Seismic exploration	surface and subsurface impacts - linear networked vegetation clearing and soil disturbance, vibration and "explosive" disturbance	habitat loss and fragmentation in arid lands that do not recover quickly; in areas with subsurface irrigation, these areas become prime opportunities for invasive species introductions/colonization, brought in on equipment and through time without adequate or appropriate reclamation. disruption of daily and seasonal activities for fossorial animals (small mammals, reptiles, ground-foraging and ground-nesting birds)
Traditional extraction site development and operation, including pumping and pad sites, gathering stations, transmission/delivery facilities (distribution lines, roadway	on-site spill potential salt water injection wells flaring road networks	limited ground and surface waters (cienegas, swale wetlands, others) highly sensitive to change/contamination are at risk from chemical, drilling material, and oil spills and groundwater contamination caused by salt water injection flaring increases acid deposition which affects <a href="http://www.esa.org/education_diversity/pdfDocs/aciddeposition.pdf">http://www.esa.org/education_diversity/pdfDocs/aciddeposition.pdf</a> - not sure how this directly affects SGCN or habitats? Extraction operations cause clearing, road networks, pad sites, and large mechanical infrastructure(s) which contribute to direct habitat loss, direct and indirect habitat fragmentation, direct mortality from vehicles and operations, and noise/light disturbance (e.g. sand dunes west of Odessa, dunes sagebrush lizard is threatened by these operations and road mortality; nocturnal birds and bats can be adversely impacted by the light and noise pollution; road networks, constant traffic and noise, and mechanical infrastructure interrupts seasonal and daily movements, foraging and mating behaviors of some mammals, reptiles, and birds; small geographically limited populations of desert plants fragmented or lost).
Hydraulic fracturing ("fracking") or "shale gas" extraction	Woodford gas deposits underlay the northernmost "finger" of this ecoregion in Texas, and this coincides with one of the nation's most fragile aquifers – the Ogallala (see <a href="http://www.energyindustryphotos.com/shale_gas_map_shale_basins.htm">http://www.energyindustryphotos.com/shale_gas_map_shale_basins.htm</a> and Major Aquifers map in the Statewide handbook or on the Texas Water Development Board's website) deeply injected chemical liquid which fractures substrates and releases gas for capture and delivery: potential groundwater risks, potential chemical spill risks, geologic destabilization	Groundwater and its surface expression in seeps, springs and cienegas are extremely important habitats in this ecoregion (e.g. LIST SPECIES); groundwater contamination could cause total loss of isolated aquatic populations, adversely affect vegetation that depends on water quantity and quality at springheads, seeps, riparian areas, and instream. Contamination also poses a risk to human and livestock water sources. Fracturing activities may also adversely affect the recharge capacity of porous rock layers and networked karst features.
Lack of Reclamation	reclamation standards vary, requirements limited unmonitored/unregulated decay of obsolete production sites - toxic chemicals in soils and leftover equipment, decaying equipment	Reclamation not required back to NATIVE vegetation (invasive species allowed to colonize or are directly planted for soil stabilization)
Mining		
Sand and Gravel - upland and riverine	sand and gravel mining along and within streams and rivers	loss of riparian habitats for instream and adjacent mining, sedimentation in streams contributes to loss and degradation of instream habitats
Gypsum	Was mentioned in workshop but without details	
Communications Infrastructure		
Cell and other communication towers		
Transportation		
road and bridge construction (new)		
right of way maintenance	maintaining clear right-of-way for vehicle clearance/access, minimizing fire danger, and maintaining driver visibility	mowing, trimming (permanent fragmentation, erosion) herbicide application some rare plants are known only from sites in ROW; these are not always adequately protected as staff changes occur, management plans are filed

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
		away, information not passed through entire chain of command - needs better communication in some places
Land & Water Mgmt: FARM	See also Water Development section	
Lack of soil and water management and conservation practices	Area is intensely developed for agricultural production; most of the crop types are not organic (citation?); chemical-laden irrigation water runoff is an issue especially for streams already at "carrying capacity" for sediment and salinity.	adverse impacts to sensitive aquatic insects and other invertebrates, fishes, and amphibians
Unsustainable irrigation	Timing of water use for irrigation do not account for fish and wildlife needs or for instream downstream water quality maintenance See also <i>Groundwater Planning and Distribution</i>	
Land & Water Mgmt: RANCH	See also Water Development section	
Incompatible stocking practices	In some areas, working lands are still recovering from historic uses, out-of-date stocking and grazing practices (prior to soil, native vegetation, and water conservation knowledge we have today) historic and/or current range-intensive livestock operations out of sync with land capacity	In some areas, working lands are still recovering from historic uses, out-of-date stocking and grazing practices (prior to soil, native vegetation, and water conservation knowledge we have today) Grassland birds affected: Eastern Meadowlark, and Cassin's Sparrows
Landowner/land management incentive programs working at cross-purposes	Conservation Reserve Program recommendations for nonnative grass planting	
Fencing	netwire fencing high game fencing	Netwire fencing and most "game" fencing fragments pronghorn daily and seasonal movements, restricts their access to water and food, and increases their vulnerability to predation; their movements are interrupted by fences under which they cannot crawl (they do not jump fences). Issue causes lack of genetic diversity through inbreeding, lack of dispersal into available appropriate habitats (which means that role is unfulfilled or filled by ... instead in the system), and potentially concentrates pathogens
Clearing and loss of important natural sites/habitats	Springs, swales altered for stock uses	Loss of natural spring and swale wetland habitats for aquatic and grassland species
Lack of soil management and conservation practices	<b>inappropriate herbicide application (Spike) for mesquite control</b> lack of soil conservation (vegetation conservation/restoration) along stream courses and on grazing lands, soil erosion	<b>is this in the right place – what category better??</b> Hydrology and streamside vegetation are altered, soil and vegetation is lost in upland areas, water quality is degraded through sediment-laden runoff; dealing with historical and contemporary issues, need, in some instances, different approaches for recovery/restoration
Fire suppression and lack of or inappropriate application of Rx fire	Little to no efficacy of applied fire - scale of application does not match ecological need	The lack of fire and excessive grazing during drought results in degraded grasslands and bare, erodable soils, which can contribute opportunity for brush encroachment into these areas..
Land & Water Mgmt: Municipal	See also Water Development section	
Lack of Zoning and Planning	Planning efforts are minimal, rarely regional except for transportation	Land: Urban sprawl and little regulation on development type contributes to arid land habitat loss of many types (grasslands, shrublands) with potential to effect further adversely affect prairie dogs, mountain plover, and other SGCN
Land & Water Mgmt: Conservation & Recreation		
Inadequate/Inappropriate Management	managing wildfire	
Inappropriate Recreational Uses	ORV use in sensitive areas (stream beds, "breaks")	
Not all "public" or "managed" lands are "conservation" lands	While most public lands in this region are managed for recreation compatible with wildlife and fisheries resources, some improvements could be made to	

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
	trails and recreation facilities to prevent soil erosion, vegetation loss	
Lack of long-range conservation planning and cohesive land conservation/management strategies in each ecoregion	This ecoregion is highly fragmented and would benefit from cohesive longrange planning for conservation connectivity; Playa Lakes JV BCR 19 covers most of this ecoregion. Other species would benefit from analysis and inclusion.	
Water Development, Management and Distribution	SEE ALSO STATEWIDE HANDBOOK	
Surface Water Planning	Natural resources not well-defined or required as a "constraint" in Regional Water Planning (RWP) processes; natural resource professionals are not consistently involved in RWP processes Large municipalities' demands are the primary driving force in surface and groundwater planning Overallocation and dewatering of region's principle rivers Central Great Plains (TX) is not experiencing the sprawling urban/suburban growth that many other areas of Texas are; however, water is a scarce and precious resource out here. . Groundwater withdrawals and surface water diversions deplete the amount of water available for wildlife.	Both surface water and groundwater use for agriculture and municipalities in the U.S. and Mexico (Rio Conchos) has reduced the amount of water present in rivers, creeks, and springs. Altered flooding regime (timing, periodicity, amounts) that adversely affects flood-dependent riparian and aquatic systems See also other sections: Other Water Source Developments and Technologies: Interbasin Transfers Reservoir Construction and Operation Groundwater Planning and Distribution
Reservoir Construction and Operation	Timing/Periodicity/Intensity of Water Releases releases are unnaturally intense and short duration in the "wrong" season to mimic natural flooding processes – <b>WHERE? WHAT RESERVOIRS specifically?</b>	Unnatural hydrograph scours instream and stream-adjacent habitats, shifts vegetation communities out of sync with other riparian communities where flooding is more "natural", vegetation communities and instream animal (invert, fishes, etc.) cannot "rely" on the seasonal changes under which they evolved.
Groundwater Planning and Distribution	Not all aquifers have groundwater districts which collaborate with fish and wildlife professionals; groundwater districts are political subdivisions, not aligned necessarily with aquifer boundaries Extraction: groundwater pumping without full accounting for natural resources as a "use"	Many of the rivers and their tributaries in this ecoregion support instream species and streamside vegetation which has evolved to tolerate a certain threshold for salinity; changes in groundwater and surface water extraction and methods have changed that salinity in some areas, which can adversely affect species tolerance.
Other Water Source Developments and Technologies	Potential reservoir development, water diversion and chloride removal projects within the Upper Brazos region	Increased salinity and other changes in water chemistry in waterbodies receiveing discharge from these operations; potentially impacting the sharpnose and smalleye shiners appropriate siting, waste discharge, and monitoring will be important to avoid, minimize or mitigate effects
Lack of Information & Resources		
	Lack of small mammal species distribution and effects of habitat fragmentation	Information needed on distribution, population stability and threats to the Texas kangaroo rat to craft specific management plan and recommendations to roll out to the region
	Lack of Data (amount, type)this tied to "Lack of Processing Existing Data" lack of bird monitoring data for riparian and native grasslandecosystems Lack of information on the population/distribution/etc on numerous SGCN is a significant problem <b>Climate change models, GIS analysis of land conversion and change overtime, species specific information, community-specific information – see CLIMATE CHANGE SECTION in Statewide handbook</b>	Little data is collected in this region, and if it is, it is rarely placed in the TXNDD for conservation practitioners to view or use for monitoring or assessment. See also Playa Lakes JV BCR 19 Recommendations

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
	Lack of Processing <i>Existing</i> Data this tied to "Lack of Information (amount, type)"	Where census, survey, records and collections are documented, little is done with the data to detect trends and causes for upward or downward shifts. Without this information, it is difficult to focus or prioritize management objectives or share information with private landowners about the importance of some sites, populations or communities. Sharing this information with landowners is crucial as most of Texas is privately owned and conservation must occur with their stewardship help.
	Inadequate understanding of available or widely-accepted conservation Best Management Practices	Primarily related to riparian conservation – need regionally specific riparian BMPs and implementation in a coordinated way to incentivize private landowners to buffer contributing and mainstem water resources
Inadequate Policies, Rules, Enforcement		
Wetland Protection	Loss of and impact to "non-jurisdictional" wetlands and other waters	Playas and other isolated swale grassland wetlands are at risk – unregulated fill and damage to underlying retention substrate from plowing through; these sites are EXTREMELY important to migratory waterfowl, grassland birds (when dry, they function like grassland habitats for some breeding birds)
Other Cross-Cutting Issues		
	Lack of Conservation Funding	Despite the infusion of resources to JVs, LCCs and NRCS Farm Bill programs, this region (like others in Texas) would benefit from a reliable steady source of conservation funding like that proposed with the Teaming with Wildlife Act.
	Climate Change	Climate change models, GIS analysis of land conversion and change overtime, species specific information, community-specific information – see CLIMATE CHANGE SECTION in Statewide handbook  highly localized and intrinsically rare species will have few options to adapt as habitats shift, change, or disappear with climate change in this region; options for transplanting or translocation are few to none as many of these habitats are edaphically specialized in the region.

## CONSERVATION ACTIONS

*“Like the resource it seeks to protect, wildlife conservation must be dynamic, changing as conditions change, seeking always to become more effective.” – Rachel Carson*

To make conservation progress, we need to work with the information we have, document our progress, share lessons learned, and adapt our approach when necessary. Conservation actions in this handbook are aimed at reducing the negative effects of issues that affect SGCN, rare communities and their habitats at various scales. [Broad actions categories](#) are defined to help organize handbooks. For information about how the Actions framework was developed and for definitions of Action categories, see the *Overview Handbook*.<sup>6</sup>

Actions proposed for the **CGPL** Ecoregion ([Table 7](#)) state what we need to work on, where, and why (what problem we can solve with that action). Actions lay out how that work contributes to a specific desired effect –progress and success.

It is important to acknowledge that one conservation action typically does not solve one conservation problem. There may be several actions employed over time to achieve a conservation goal. In some instances, defining the conservation goal *is* the action – for some things, we don’t yet know enough to define what successful conservation looks like for that SGCN population, rare community, or habitat.

It has become increasingly important to determine if the work we do is actually leading to the overall conservation outcomes we desire – **restoration, recovery, sustainability, and resiliency**. As conservation practitioners, we can use milestones (or intermediate results) and reporting to communicate our progress and leverage future conservation action, partnerships, policy changes, and funding.

From [project inception, well-crafted monitoring and evaluation](#) (cost effective, answers key questions) informs management and allows conservation practitioners to “course-correct” as necessary for effective conservation (CMP 2007, Salzer and Salafsky 2006). With the need for Action Plans to take advantage of several “pots of conservation money,” the people we serve and those who govern private and public conservation funds demand reporting, transparency, and *demonstration* that projects are *positively impacting the conservation of species and habitats*. To get beyond reporting that money was spent and projects were done, AFWA TWW convened a committee in 2009 to craft “effectiveness measures” for the conservation actions across all Plans. A [toolkit for classifying and measuring conservation action effectiveness](#) was produced in 2011, approved by AFWA TWW Executive Committee comprised of state fish and wildlife agency directors and others. These measures will be an important part of moving the plans and conservation forward.

With this revision, the TCAP becomes more involved in a national movement to track conservation actions and progress across local, state, regional and national levels. As with the 2005 Plan, actions presented in this edition vary in detail, scale, and duration; however, this edition encourages the use of the incremental measures of success for conservation projects’ development, implementation, and tracking. To that end, the toolkit in [Measuring the Effectiveness of State Wildlife Grants](#) (AFWA TWW, 2011) is **strongly recommended** to define projects, target audiences and partners, identify desired step-wise intermediate results, and collect the “right” data to report our conservation achievements.

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<sup>6</sup> The category “*Data Collection, Analysis, and Management*” meets Action Plan Required Element 3 – “priority research and survey”. Many of the proposed actions include a monitoring component (Action Plan Required Element 5).

**Table 7. CGPL Conservation Actions**

Note: Table is formatted 11" x 17", landscape orientation – SEE ALL OF THE [EFFECTIVENESS MEASURES](#) FOR EACH OF THE OVERALL ACTIONS TO ESTABLISH FINER DETAIL IN PROJECT IMPLEMENTATION

Conservation Action	Direct Mgmt of Natural Resources	Species Restoration	Creation of New Habitat	Acquisition, Easement, or Lease	Land Use Planning	Training, Technical Assistance	Data Collection, Analysis, Management	Conservation Area Designation	Education, Targeted Outreach	Environm Review	Mgmt Planning
<p>Lack of information for this region is a primary conservation concern: gather site-specific information (e.g. precise location (GPS coordinates/boundaries), number and condition of individuals observed, habitat description, existing or potential threats) which can be shared publicly in the Texas Natural Diversity Database (TXNDD).</p> <p>In order to do this strategically, TPWD Wildlife Diversity and Technical Guidance biologists could work with Playa Lakes JV coordinators, NRCS Wildlife Biologists, USFWS Partners Program biologist, data from the Texas Ecological Systems Mapping Project and local land trusts to determine where the highest priority habitats for SGCN are potentially located in this region. Landowner workshops about the importance of this data could promote voluntary participation in this effort. TXNDD staff would be helpful to attend this/these sessions to train partners on data collection formats/needs.</p> <p>The data gathered through this endeavor should be entered in the TXNDD within 6 months of TXNDD staff receiving all of the data</p>											
<p>Desalination, chloride removal, sand and gravel mines, and SGCN fishes need to be mapped in conjunction with the data from the National Fish Habitat Action Plan watershed risk assessment to determine where and to whom targeted outreach efforts for water quality would be most useful.</p>											

Conservation Action	Direct Mgmt of Natural Resources	Species Restoration	Creation of New Habitat	Acquisition, Easement, or Lease	Land Use Planning	Training, Technical Assistance	Data Collection, Analysis, Management	Conservation Area Designation	Education, Targeted Outreach	Environm Review	Mgmt Planning
<p>Playa Lakes Joint Venture BCR 19 Area Implementation Plan (2008). Review elements of the Plan to identify mammals, herps, inverts, plants and communities from TCAP to identify specific overlap, monitoring objectives and potential gaps in other species' or assemblages coverage. If there are additional conservation objectives which are not covered by BCR 19 AIP and promote those to the regional Landscape Conservation Cooperative. Tie these recommendations to the National Fish Habitat Action Plan and ESSS conservation sites to enhance conservation connectivity for all fish and wildlife resources.</p> <ul style="list-style-type: none"> <li>• Convert 744,516 acres of cropland to CRP or CRP-like habitat (<b>Cassin's and Grasshopper Sparrow</b>); new acres should be planted to native grasses with forbs (<b>Lesser Prairie-Chicken</b>)</li> <li>• Manage 19,115 acres of shinnery so it contributes to large blocks of habitat by targeted placement of CRP-like habitat (<b>Lesser Prairie-Chicken</b>)</li> <li>• Convert 1,000,000 acres of Juniper to mixed grass prairie (<b>Swainson's Hawk, Loggerhead Shrike</b>)</li> <li>• Convert 3,708,500 acres of Mesquite/Juniper habitat to mixed grass prairie (<b>grassland birds</b>)</li> <li>• Manage 6,581,113 acres of mixed grass with few shrubs (1-3% cover) (<b>grassland birds</b>)</li> <li>• Convert 3,162,817 acres of current mesquite shrubland to savannah (<b>Scissor-tailed Flycatcher, Lark Sparrow</b>)</li> <li>• Increase large native cottonwoods in urban/suburban areas by 137,060 acres (<b>Mississippi Kite</b>)</li> <li>• Increase late successional riparian forest by 234,923 acres (<b>Mississippi Kite</b>)</li> <li>• Increase native riparian shrubland, especially along the Canadian and Red Rivers, by 174,983 acres (<b>Bell's Vireo</b>)</li> <li>• Manage 28,424 acres of shortgrass prairie for few shrubs and high grass, within the northern third of the Area (<b>Lark Bunting</b>)</li> </ul> <p>Restore and employ moist-soil management practices on 36,704 acres of wetlands (<b>waterfowl</b>)</p>											

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<p>Brush management objectives for species conservation needs to be done in conjunction with the Texas Ecological Systems Mapping Project data for desired ecological condition; brush management is not appropriate on all sites (some areas need other prescriptions to manage understory and promote mature savanna – mesquite, oak). Additionally, some mixed oak – juniper woodlands are appropriate in canyon areas in the southern extent of this ecoregion; not all juniper is “out of place.” Apply Farm Bill programs for brush management with willing landowners to benefit grassland species in sites evaluated for SGCN and desired ecological condition that supports grassland and appropriate savanna types. Monitor to document that these management practices are effective in grassland species conservation (see Effectiveness Measures)</p> <p>Form multi-partner working group(s) to establish scientifically sound best management practices for <b>chemical/mechanical brush control</b> for the ecoregion and specific watersheds</p>											
<p>Conservation easements and landowner incentive programs are the best instruments for landowner participation in this region. Landowners with intact grasslands (especially those within <b>priority grassland areas identified by the Playa Lakes JV</b>, grasslands with restoration potential for little investment, landowners willing to change to pronghorn-sensitive fencing where appropriate, riparian corridors along Ecologically Significant Stream Segments (and to their headwaters), and/or isolated wetlands should be first-eligible. Monitoring of key species (to be identified) must be a part of these projects. Information about methods, short and longterm success (or failure) need to be shared through conservation networks (see Statewide/Multi-region Issues handbook – Information Actions section).</p>											
<p>Work with local landowners, adjacent grassland ecoregions, and planning partners to identify and designate <b>Important Bird Areas</b>, primarily for grasslands</p>											
<p>Form multi-partner working group(s) to establish scientifically sound best management practices for <b>prescribed fire application</b> for the ecoregion (timing/season, period/duration, intensity, parameters for RX) for the restoration of sites and heterogeneity in grasslands, but also the longterm health and sustainability of desired ecological conditions (plant communities); work with Rx fire technical experts AND rare species experts to identify concerns, barriers, and solutions.</p> <p>Monitor (select keystone suite of grassland species – all taxa) to determine effectiveness of the applied practices</p>											

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Form multi-partner working group(s) to establish scientifically sound best management practices for <b>riparian restoration</b> (cottonwood, sycamore, <b>other?</b> ), including timing, water needs, reasonable recommendations for initial planting diversity, ways to encourage full complement of desired ecological condition of community, how to prevent or control specific invasives without negatively impacting restoration, locally sourced seed and plant materials for the ecoregion (and finer scales if needed)											
Create a multi-disciplinary ecology committee to identify three to five years of highest priority research projects (actual projects, not just concepts) <b>specific to this ecoregion</b> that can be rolled out to universities and collegest to collect the information most needed at the PRACTICAL level for management and conservation improvement on the ground for SGCN and rare communities (not just charismatic fauna, threatened and endangered species – choose keystone species for priority habitat types).											
Identify a host website to share ecoregional practitioner (not novice, not landowner, but professional) cross-training opportunities for RX fire, stream rehabilitation, reintroductions, brush management, GIS and corridor identification, <b>other ...</b>											
Work with willing landowners <i>especially adjacent to and in corridors between</i> well-managed public lands to restore and manage grassland and riparian communities in large single-ownership or smaller acreage cooperatives – opportunities to connect/improve historically fragmented management											
Work with city and/or regional planners affecting Wichita Falls, Abilene, and Brownwood to reduce the human-induced pollution risks and increase water conservation in the high to very high risk HUC 12 watersheds idenitified in the National Fish Habitat Action Plan; identify specific measures that can be implemented and establish monitoring to determine if outreach and coordination with planning entities is effective											
Many SGCN in this region lack distribution and POPULATION status information. This lack of information can contribute to “false rarity” determinations; more information and cooperation from private landowners may reduce the risk of listing, enhance recovery options, and contribute to conservation of many sensitive habitats just through awareness and documentation ( <b>EDITOR’s NOTE: SEE THE LIST IN THE CHIH ECOREGION FOR EXAMPLES – this ACTION should be more specific</b> )											

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Review TPWD policies and regulations on trapping of furbearers and non-game species to reduce unintentional loss of non-target SGCN including (badger, skunks, and swift fox). Increasing trap inspection intervals from every 36 hours to every 24 hours for furbearers and requiring 24 hour trap checks for non-furbearing target species would potentially reduce the number of non-target losses. Consider implementing mandatory trapper education classes to improve trapping techniques that reduce non-target losses											
Instream and riparian area rehabilitation and conservation measures in/adjacent to identified stretches of all Ecologically Significant Stream Segments: recommendations for instream flow, quality and intensity management; riparian restoration; and specific work to increase resiliency to climate change											
Climate change models and effects on isolated wetlands and playas, riparian areas, native grasslands, and springs/groundwater resources											
Host landowner workshops on conservation instruments – Safe Harbor Agreements, Candidate Conservation Agreements, others – to dispel myths about regulatory constraints. Showcase specific studies and examples from the region (or adjacent ecoregions) for better relationship building. Document through conservation practice and partner surveys over the course of three to five years whether the workshops increase opportunities for these tools to be used and the SPECIFIC barriers to their use											
<p>Improve Environmental Review and Consultation for voluntary practices (wind, solar, communications, transportation):</p> <p>Create mapped zones of sensitive areas (raptor migration corridors, whooping crane sites/corridor, proximity to colonial habitats, <b>other?</b>) to share with wind developers to encourage better siting</p> <p>Identify timing and intensity of barotraumas and impact hazards from wind turbines and encourage wind generation companies to modify practices</p> <p>Identify non-compliant communications towers and provide incentives to bring into compliance (lighting, height); outreach to communications companies about the local hazards of communiation towers and recommendations to improve practice to improve conditions for all nocturnal migrants, Painted Bunting, Summer Tanager</p> <p>See Transportation section of Statewide/Multi-region handbook regarding bridge and culvert design (in this region, primarily for SGCN bats)</p>											

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Determine market values that are driving row crop production, ORV recreation, and land sales in this region. Craft a recommendation to landowner incentive program providers that can be used to index conservation practice incentives in ecoregions. Monitor whether this approach was effective to change the conservation program values AND landowner participation in those programs before & after the change.											
Identify the barriers to RX fire application to significant grassland restoration areas. Make management recommendations (timing, season, periodicity) to overcome barriers AND match more natural fire episode timing. Craft TARGETD outreach plans to overcome these barriers and work with landowners in core grassland restoration and recovery areas to benefit pronghorn, grassland birds, and small mammals and reptiles. Select a few keystone species for monitoring in these areas – see above.											
Work with private landowners and conservation partners to minimize feral hog populations through aerial shooting, hunting, and trapping. Provide technical guidance and educational programs about the impact and management of feral hogs to benefit ground nesting birds, small mammals, aquatic species <b>IS THIS AN ISSUE IN THIS ECOREGION??</b>											
Where wildlife and fisheries management are not the primary objective and where livestock production is the primary objective, refer landowners to agricultural production partners who can assist them with best management practices for rotational and site-appropriate grazing management											
Species Restoration: <ul style="list-style-type: none"> <li>Pronghorn populations (not just individuals) coincidental with habitat improvement, fence replacement, restocking, parasite research and plan to deal with this problem, genetic enhancement (?)</li> <li>Black-tailed prairie dog – burrowing owl – black-footed ferret ecosystems: introductions, habitat improvement, management recommendations for compatible land uses</li> </ul>											
<b>NEED AQUATIC CONSERVATION PROJECTS FOR THIS ECOREGION SPECIFIC TO WATERSHEDS (HUC 8 LEVEL PREFERRED)</b>											

NOTE: Almost all of these actions would benefit from more regular cooperation among conservation practitioners in the region. A share-site for conservation practice would be a useful tool. See Statewide/Multi-region handbook AND the [Effectiveness Measures](#) report’s evaluation of existing conservation practice sharing tools (Appendix IV). This will go a long way toward landscape-level planning and shared priorities.

## CONSERVATION PARTNERS AND PROGRAMS

This section to be developed following all Actions, prior to USFWS review in August 2011

## RESOURCES AND REFERENCES

Resources and References will be finalized after the handbook has been completely drafted. These and other resources will be compiled into one large document on the website after USFWS review.

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