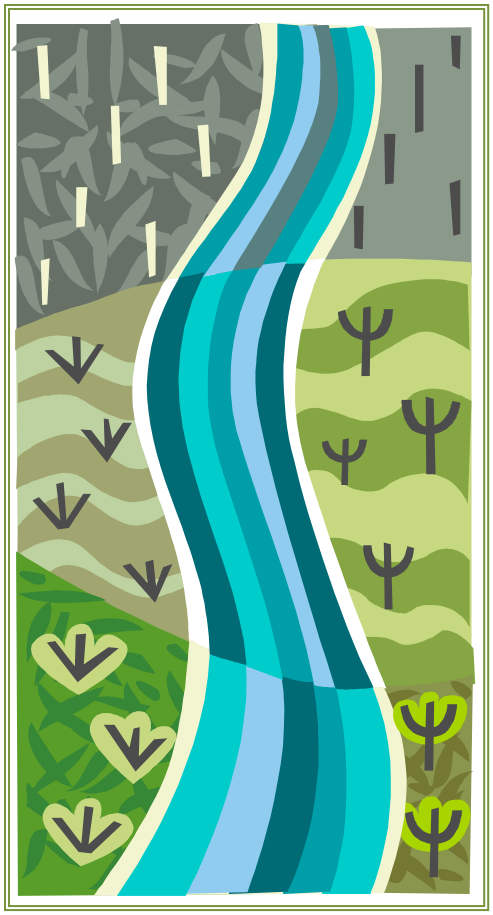

TEXAS CONSERVATION ACTION PLAN

Gulf Coast Prairies and Marshes

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.

In accordance with Texas State Depository Law, this publication is available at the Texas State Publications Clearinghouse and/or Texas Depository Libraries.

PWD insert number when approved

Citing this document:

Texas Parks and Wildlife Department. 2011. **Texas Conservation Action Plan 2011 – 2016: Gulf Coast Prairies and Marshes Handbook**. Editor, Wendy Connally, Texas Conservation Action Plan Coordinator. PWD insert number when approved. Austin, Texas.

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See links on Texas Parks and Wildlife Department's Texas Conservation Action Plan 2011 Web Page 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 Gulf Coast Prairies and Marshes (GCPM) 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 GCPM 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 GCPM 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 GCPM 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 (TPWD 2007).

If you have questions about the TCAP content and cannot find what you need on the TPWD TCAP 2011 website or in one 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

OVERVIEW

A one-page description of this ecoregion is being developed during the public comment period. For more information about the ecoregion's features during this time, please review Griffith (2010) and Griffith et. al. (2007).[1]

Editor's Note: Although this handbook addresses the Gulf Coast Prairies and Marshes as one ecoregion, the TPWD Coastal Fisheries Division requested splitting the ecoregion during workshops (see Overview Handbook) in the way that most of the regional programs (TPWD's and others') work. To that end, the Gulf Coast Prairies and Marshes information in this document is occasionally split into three subregions based on bay systems:

Upper	Sabine Lake; Galveston Bay
Middle	Matagorda Bay, San Antonio Bay, Aransas Bay, Corpus Christi Bay, Upper Laguna Madre
Lower	Lower Laguna Madre

Table 1 crosswalks this ecoregion with other conservation planning units.[2]

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), and Ecologically Significant Stream Segments[3] (ESSS) which occur in this area.

Figure 2 shows those EDUs, HUC8s and ESSS by ecoregion.

[1] Griffith, G. 2010. Level III North American Terrestrial Ecoregions: United States Descriptions. Prepared for the North American Commission for Environmental Cooperation (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 (accessed May 2009).

[2] For more information about planning boundaries, see the Overview handbook on the TCAP 2011 website http://www.tpwd.state.tx.us/landwater/land/tcap/

[3] TPWD. 2002/2005. *Ecologically Significant Stream Segments*. http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/sigsegs/

Table 1. Crosswalk of GCPM 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.

2010 TCAP *	2005 TXWAP (Gould 1960)	The Nature Conservancy Terrestrial Ecoregions (1999)	Ecological Drainage Units (Watersheds) From the National Fish Habitat Action Plan TX = Southeast Aquatic Resources Partnership and Desert Fish Habitat Partnership (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)
Gulf Coast Prairies and Marshes (**GCPM**)	Gulf Coast Prairies and Marshes	Gulf Coast Prairies and Marshes (31) and Tamaulipan Thornscrub (30)	Corpus Christi – Frio – Nueces Guadalupe – San Antonio Laguna Madre Lower Brazos Lower Colorado Lower Rio Grande/Bravo Sabine – Neches	Rio Grande JV Gulf Coast JV Gulf Coast Prairie BCR	Gulf Coast Prairie	South Texas Rio Grande (2) Nueces Coastal Bend (3) Guadalupe – San Antonio (4) Colorado Lower (5b) Brazos Lower (6b) Trinity – San Jacinto (7) Deep East Texas (8)	Southwest Plateaus and Plains Range and Cotton Region: *Lower Rio Grande Plain (83D), Sandsheet Prairie (83E)* Atlantic and Gulf Coast Lowland Forest and Crop Region: *Gulf Coast Prairies (150A), Gulf Coast Saline Prairies (150B), Gulf Coast Marsh (151)*	Gulf Coast Prairies and Marshes and Coastal Sand Plain

Figure 1. GCPM Ecoregion with County Boundaries

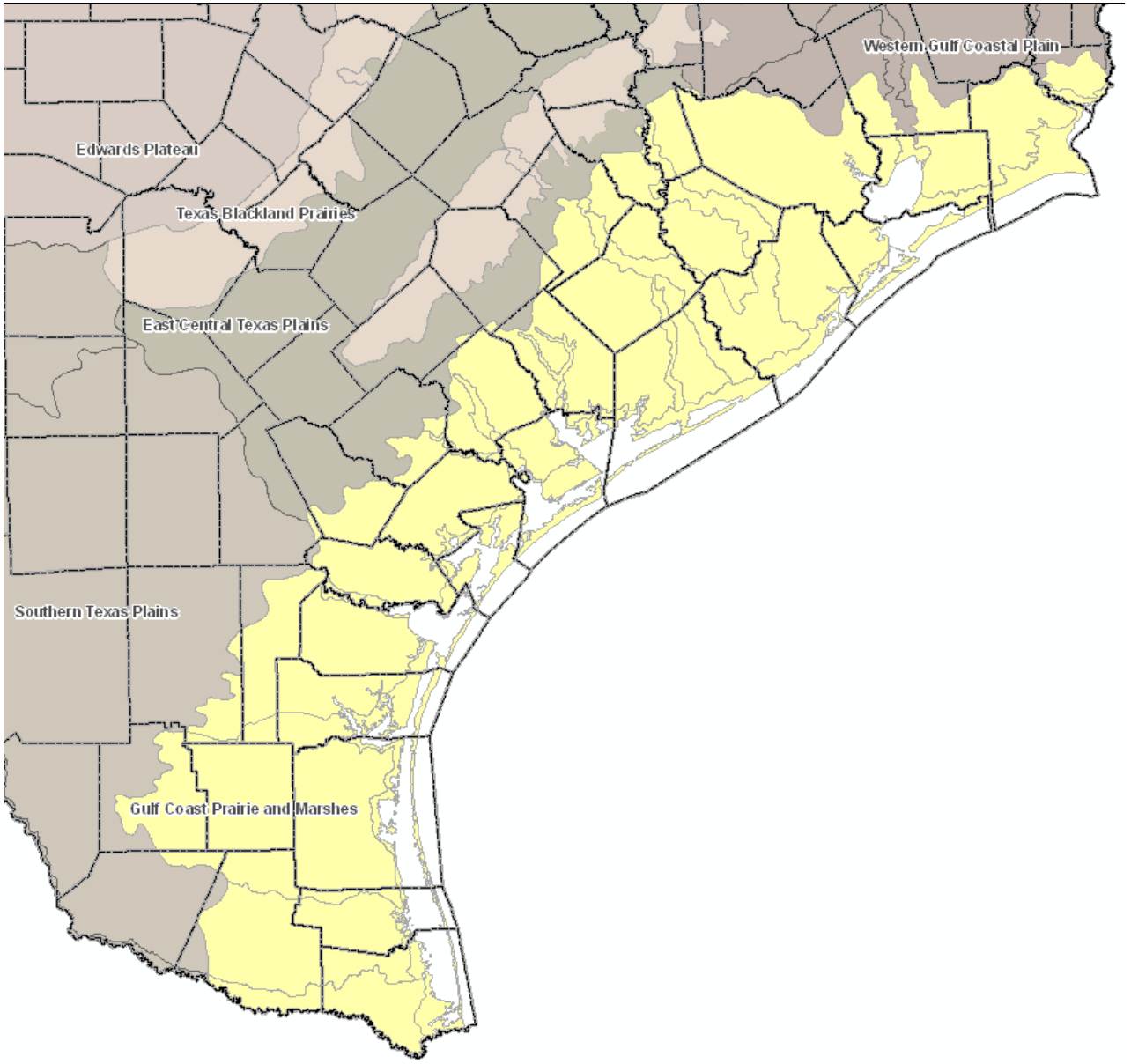


Table 2. GCPM EDUs with Ecologically Signifcant Stream Segments and Reservoirs

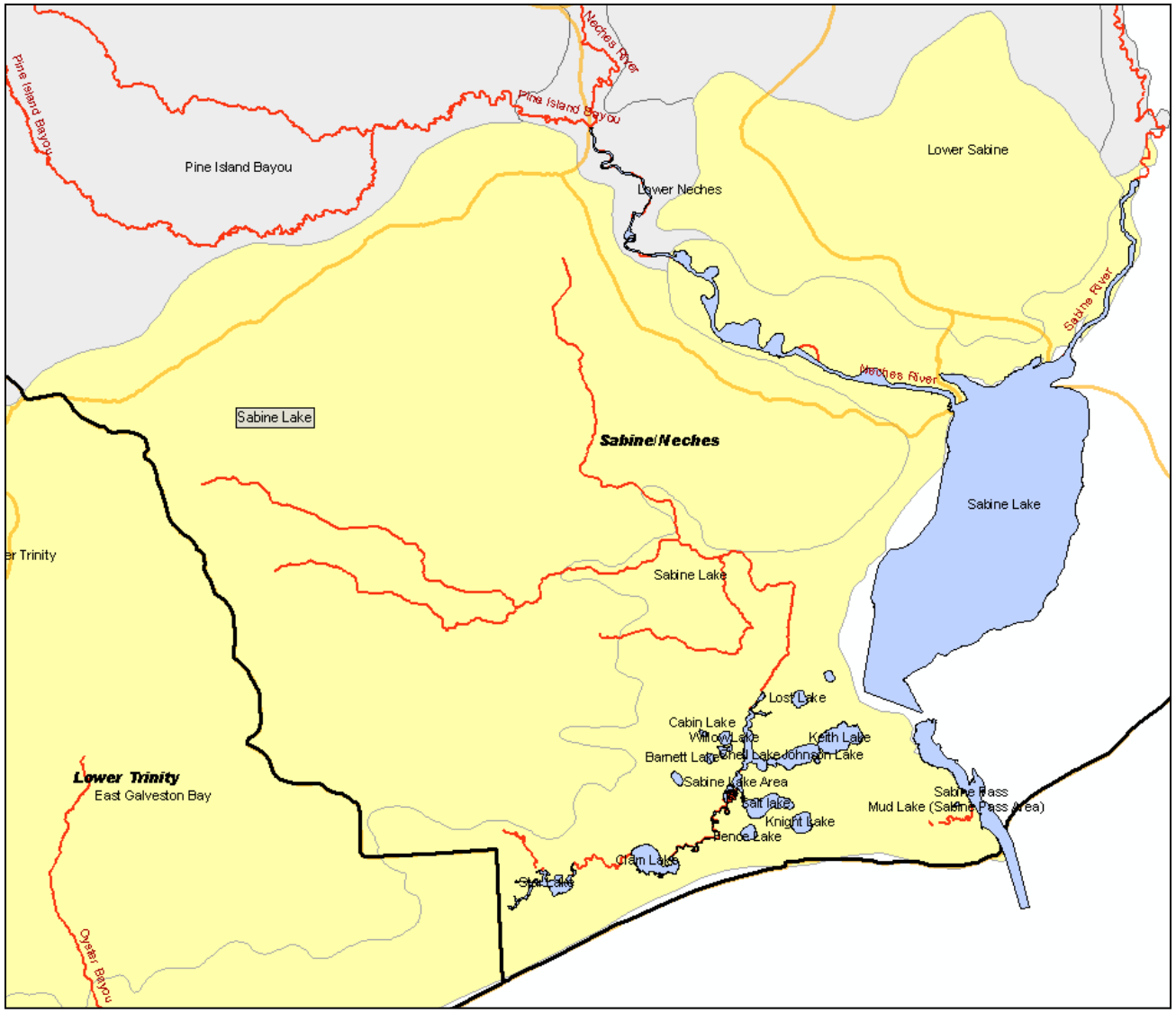
ECOLOGICAL DRAINAGE UNIT SubBasin (HUC 8)	*Ecologically Significant Stream Segment TPWD 2002, w/updates 2005*	Lakes and Reservoirs
Upper Gulf Coast Systems		
SABINE - NECHES		
Lower Sabine	Sabine River	
Lower Neches	Neches River	B.A. Steinhagen Lake
Sabine Lake	North Fork Taylor Bayou, South Fork Taylor Bayou, Taylor Bayou, Willow Marsh Bayou, Big Hill Bayou, Salt Bayou, Keith Lake/Johnson Lake systems	J.D. Murphree Impoundments
LOWER TRINITY		
Spring		
Lower Trinity	Old River	Wallisville Lake, Lake Anahuac, Cedar Bayou Generation Pond
Buffalo - San Jacinto	Carpenters Bayou	Addicks Reservoir, Barker Reservoir, Sheldon Reservoir, Lynchburg Reservoir
East Galveston Bay	Oyster Bayou	
North Galveston Bay		Cedar Bayou Generation Pond
West Galveston Bay	Armand Bayou, Clear Creek, Halls Bayou	Galveston County Water Reservoir, Mustang Lake
LOWER BRAZOS		
Lower Brazos	Clear Creek, Mill Creek, Brazos River, Big Creek	Smithers Lake, William Harris Reservoir, Eagle Nest Lake/Manor Lake, Brazoria Reservoir
San Bernard	West Bernard Creek, San Bernard River, McNeal and Redfish Bayous, Jones Creek	San Bernard Reservoirs (1, 2, and 3)
Austin - Oyster	Austin Bayou, Bastrop Bayou	William Harris Reservoir
Middle Gulf Coast Systems		
LOWER COLORADO		
Lower Colorado	Colorado River	Eagle Lake
East Matagorda	Big Boggy Creek, Cedar Lake Creek	
GUADALUPE - SAN ANTONIO		
Lower San Antonio	Guadalupe River	
Navidad	West Mustang Creek	Lake Texana
Lavaca	Lavaca River	
West San Antonio Bay		

ECOLOGICAL DRAINAGE UNIT SubBasin (HUC 8)	*Ecologically Significant Stream Segment TPWD 2002, w/updates 2005*	**Lakes and Reservoirs**
East San Antonio Bay		
East Matagorda Bay	West Carancahua Creek, Tres Palacios Reservoir	South Texas Project Reservoir, Cox Lake
West Matagorda Bay	Garcitas Creek, Arenosa Creek	
CORPUS CHRISTI - FRIO - NUECES		
Lower Nueces	Nueces River	
Aransas	Aransas River	
Mission	Mission River	
Aransas Bay		
North Corpus Christi Bay	Nueces River	
South Corpus Christi Bay		Barney M. Davis Reservoir
North Laguna Madre		Barney M. Davis Reservoir
Lower Gulf Coast Systems		
LAGUNA MADRE		
San Fernando		
Baffin Bay		
Palo Blanco		
Central Laguna Madre		
South Laguna Madre	Arroyo Colorado, Rio Grande/Rio Bravo	Loma Alta Lake, Retama Reservoir, Delta Lake, Valley Acres Reservoir
LOWER RIO GRANDE/BRAVO		
International Falcon Reservoir		
Los Olmos		
Lower Rio Grande/Bravo	Rio Grande/Bravo, below Falcon Reservoir	

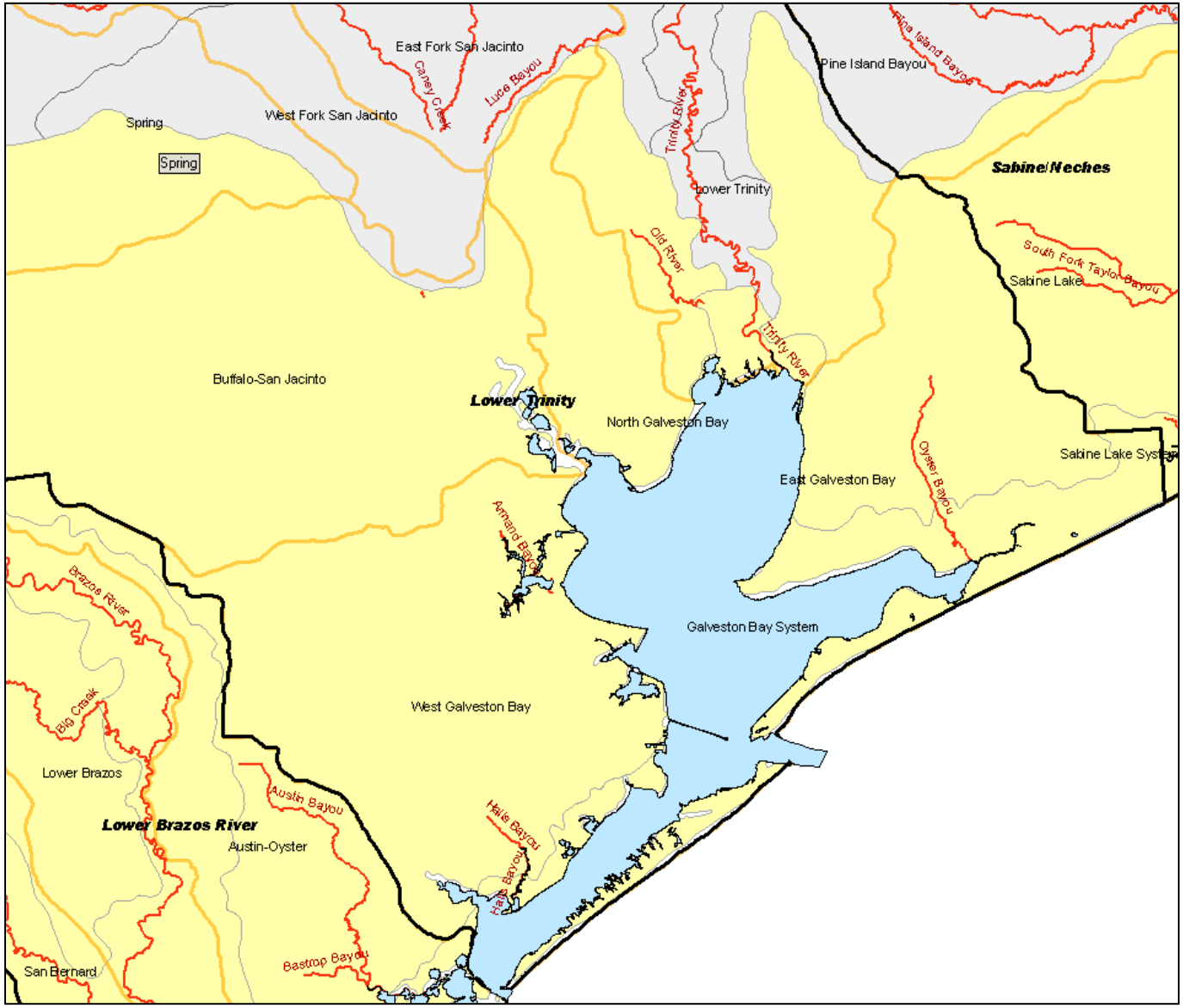
Note: Ecologically Significant Stream Segments and Reservoirs which occur in the Subbasin (HUC 8) but not in the ECOREGION are not included in this table. There may be other significant stream resources mentioned in the Priority Habitats section

Figure 2. GCPM EDUs, HUC 8s, and ESSS – 6 maps

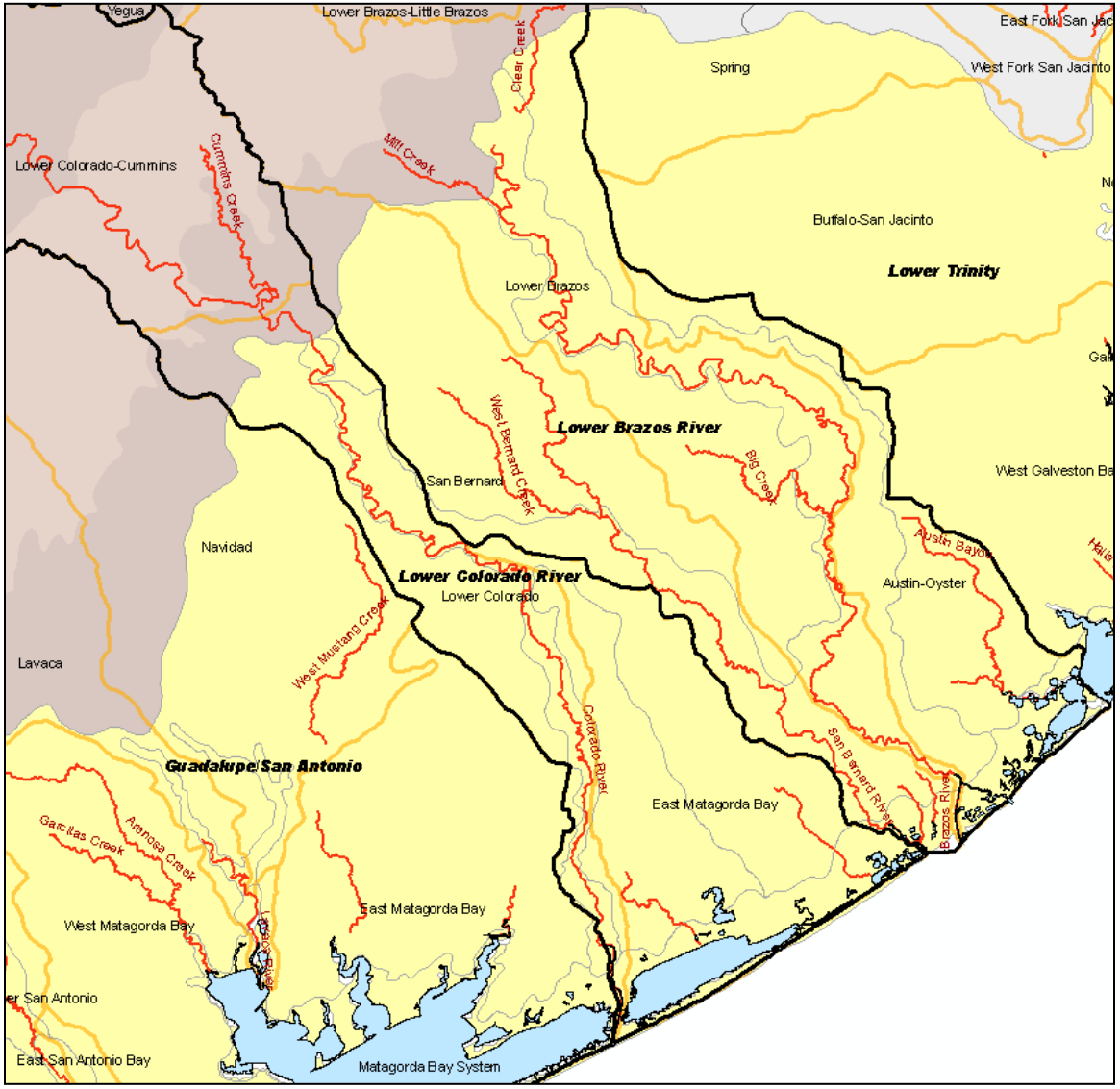
Sabine Lake EDU (upper Gulf Coast, nearest Louisiana) black outline, HUC 8s orange outline, ESSS red lines



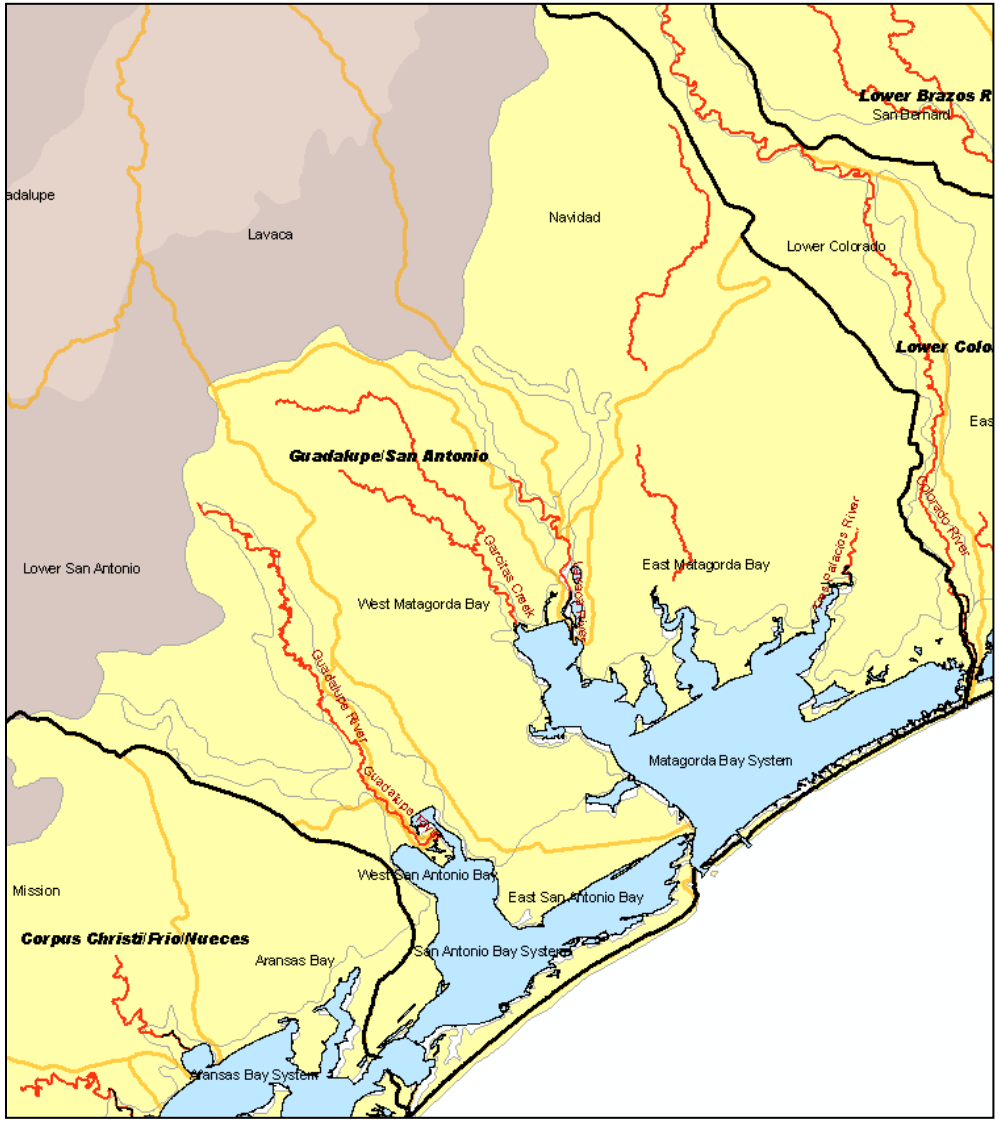
Lower Trinity EDU black outline, HUC 8s orange outline, ESSS red lines



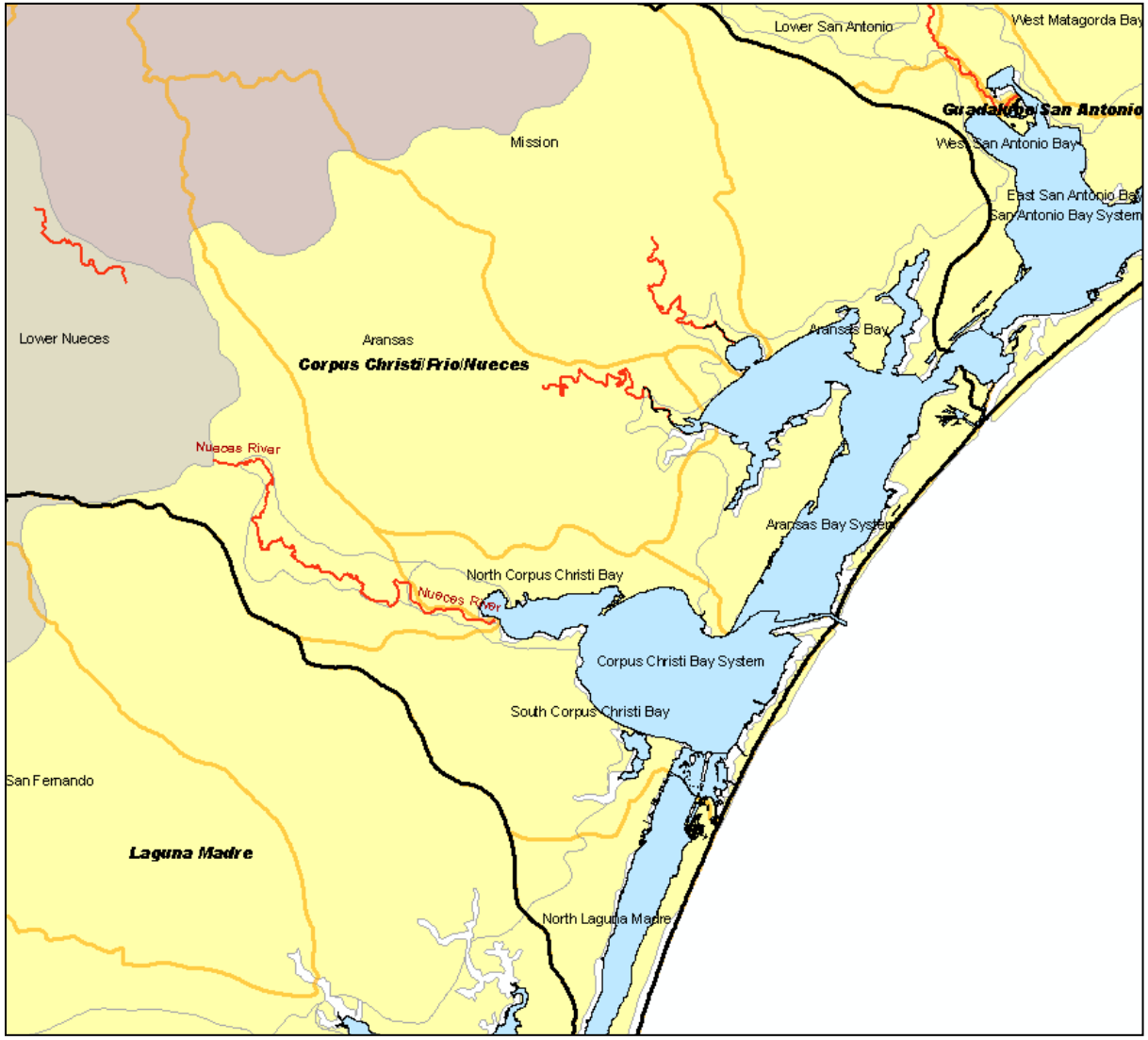
Lower Brazos River and Lower Colorado River EDUs black outline, HUC 8s orange outline, ESSS red lines



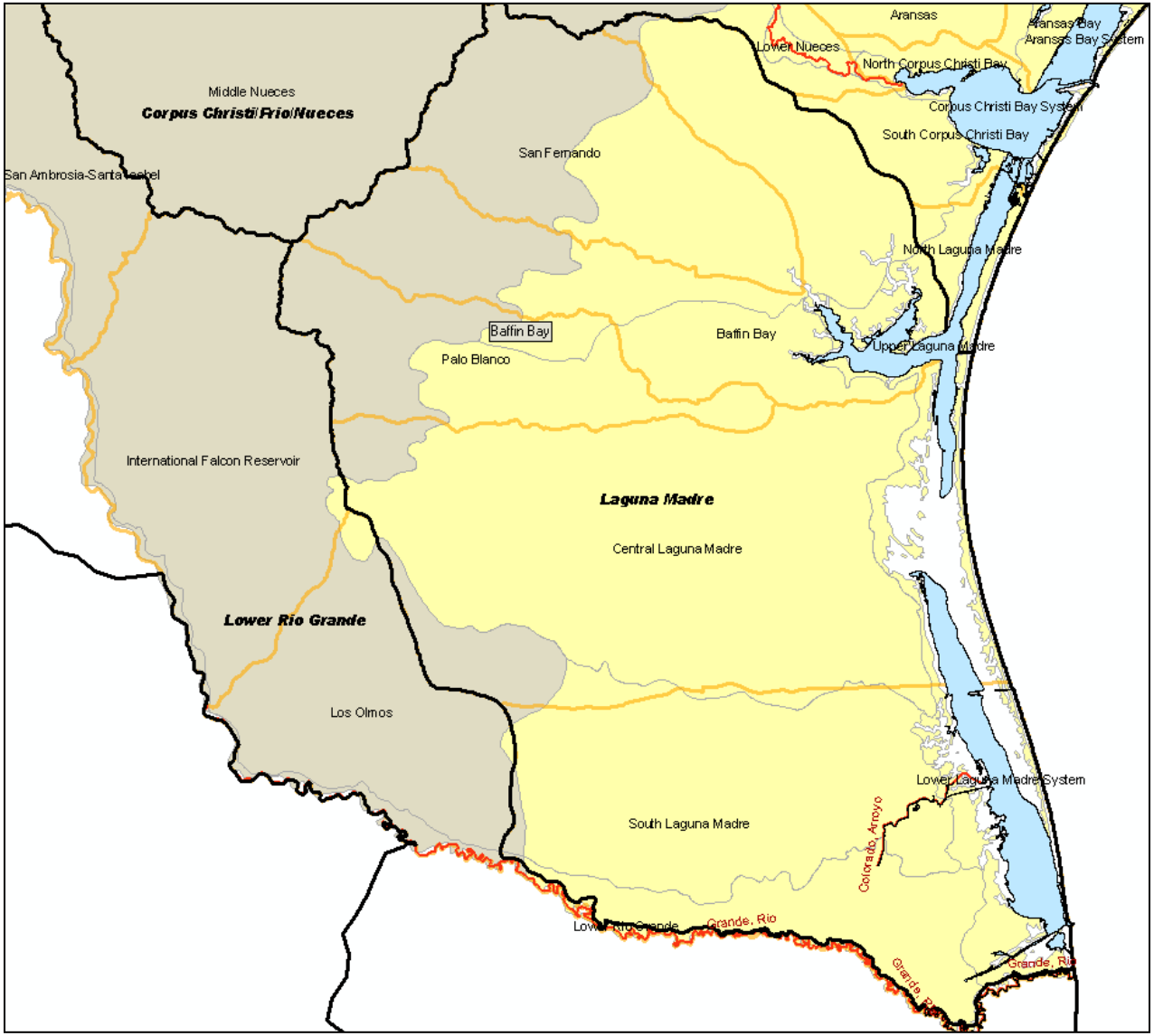
Guadalupe/San Antonio EDU black outline, HUC 8 orange outline, ESSS red lines



Corpus Christi/Frio/Nueces EDU black outline, HUC 8s orange outline, ESSS red lines



Laguna Madre EDU black outline, HUC 8s orange outline, ESSS red lines



Note: other important stream segments are 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
- Reptiles and Amphibians
- Invertebrates
- Plant Communities
- Birds
- Freshwater Fishes
- Plants

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. GCPM Species of Greatest Conservation Need (SGCN)

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

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
MAMMALS	*(see also Marine Mammals)*							
Puma concolor	Mountain lion			G5	S2	GCPM-UP	GCPM-MID	(GCPM-LWR)
Scalopus aquaticus	Eastern mole			G5	S5	GCPM-UP	GCPM-MID	(GCPM-LWR)
Tadarida brasiliensis	Brazilian free-tailed bat			G5	S5	GCPM-UP	GCPM-MID	(GCPM-LWR)
Geomys attwateri	Attwater's pocket gopher			G4	S4	GCPM-UP	GCPM-MID	GCPM-LWR
Mustela frenata	Long-tailed weasel			G5	S5	GCPM-UP	GCPM-MID	GCPM-LWR
Neovison vison	Mink			G5	S4	GCPM-UP	GCPM-MID	GCPM-LWR
Spilogale putorius	Eastern spotted skunk			G4T	S4	GCPM-UP	GCPM-MID	GCPM-LWR
Taxidea taxus	American badger			G5	S5	GCPM-UP	GCPM-MID	GCPM-LWR
Blarina hylophaga plumblea	Elliot's short-tailed shrew			G5T1Q	S1	GCPM-UP	GCPM-MID	
Geomys personatus personatus	Barrier island Texas pocket gopher			G4TNR	SNR	GCPM-UP	GCPM-MID	
Lutra canadensis	River otter			G5	S4	GCPM-UP	GCPM-MID	
Sylvilagus aquaticus	Swamp rabbit			G5	S5	GCPM-UP	GCPM-MID	

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Corynorhinus rafinesquii	Rafinesque's big-eared bat		T	G3G4	S3	GCPM-UP		
Myotis austroriparius	Southeastern myotis			G3G4	S3	GCPM-UP		
Ursus americanus luteolus	Louisiana black bear	LT	T	G5T3	SNA	GCPM-UP		
Lasiurus ega	Southern yellow bat		T	G5	S1		GCPM-MID	GCPM-LWR
Dipodomys compactus compactus	Padre Island kangaroo rat			G4T3	S3		GCPM-MID	
Geomys personatus maritimus	Maritime pocket gopher			G4	S4		GCPM-MID	
Conepatus leuconotus	Hog-nosed skunk			G5	S4			GCPM-LWR
Dipodomys ordii parvabullatus	Ord's kangaroo rat			G5	S4			GCPM-LWR
Herpailurus yaguarondi	Jaguarundi	LE	E	G4	S1			GCPM-LWR
Leopardus pardalis	Ocelot	LE	E	G4	S1			GCPM-LWR
Nasua narica	White-nosed coati		T	G5	S2?			GCPM-LWR
Nyctinomops macrotis	Big free-tailed bat			G5	S3			GCPM-LWR
Oryzomys couesi aquaticus	Coues rice rat		T	G5T3?	S2			GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
BIRDS								
Anas acuta	Northern Pintail			G5	S3B,S5N	GCPM-UP	GCPM-MID	GCPM-LWR
Colinus virginianus	Northern Bobwhite			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Meleagris gallopavo	Wild Turkey			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Ixobrychus exilis	Least Bittern			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Egretta thula	Snowy Egret			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Egretta caerulea	Little Blue Heron			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Egretta tricolor	Tricolored Heron			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Butorides virescens	Green Heron			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Plegadis chihi	White-faced Ibis		T	G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Mycteria americana	Wood Stork		T	G4	SHB,S2N	GCPM-UP	GCPM-MID	GCPM-LWR
Ictinia mississippiensis	Mississippi Kite			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Haliaeetus leucocephalus	Bald Eagle			G5	S3B,S3N	GCPM-UP	GCPM-MID	GCPM-LWR
Circus cyaneus	Northern Harrier			G5	S2B,S3N	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Buteo lineatus	Red-shouldered Hawk			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Rallus elegans	King Rail			G4	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Pluvialis dominica	American Golden-Plover			G5	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Scolopax minor	American Woodcock			G5	S2B,S3N	GCPM-UP	GCPM-MID	GCPM-LWR
Tyrannus forficatus	Scissor-tailed Flycatcher			G5	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Lanius ludovicianus	Loggerhead Shrike			G4	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Spizella pusilla	Field Sparrow			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Ammodramus savannarum	Grasshopper Sparrow			G5	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Chondestes grammacus	Lark Sparrow			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Ammodramus leconteii	Le Conte's Sparrow					GCPM-UP	GCPM-MID	GCPM-LWR
Piranga rubra	Summer Tanager			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR
Passerina ciris	Painted Bunting			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Spiza americana	Dickcissel			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Sturnella magna	Eastern Meadowlark			G5	S5B	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Icterus spurius	Orchard Oriole			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Anas fulvigula	Mottled Duck			G4	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Pelecanus occidentalis	Brown Pelican		E	G4	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Egretta rufescens	Reddish Egret		T	G4	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Buteo swainsoni	Swainson’s Hawk			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Buteo albicaudatus	White-tailed Hawk		T	G4G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Laterallus jamaicensis	Black Rail			G4	S2B	GCPM-UP	GCPM-MID	GCPM-LWR
Charadrius alexandrinus	Snowy Plover			G4	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Charadrius wilsonia	Wilson's Plover			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Charadrius melodus	Piping Plover	LE, LT	T	G3	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Haematopus palliatus	American Oystercatcher			G5	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Numenius americanus	Long-billed Curlew			G5	S3B,S5N	GCPM-UP	GCPM-MID	GCPM-LWR
Limosa haemastica	Hudsonian Godwit			G4	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Calidris canutus	Red Knot			G4	S3N	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Calidris mauri	Western Sandpiper			G5	S5	GCPM-UP	GCPM-MID	GCPM-LWR
Calidris himantopus	Stilt Sandpiper			G5	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Tryngites subruficollis	Buff-breasted Sandpiper			G4	S2S3	GCPM-UP	GCPM-MID	GCPM-LWR
Leucophaeus pipixcan	Franklin's Gull			G4G5	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Gelochelidon nilotica	Gull-billed Tern			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Chlidonias niger	Black Tern			G4	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Sterna forsteri	Forster's Tern			G5	S5	GCPM-UP	GCPM-MID	GCPM-LWR
Rynchops niger	Black Skimmer			G5	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Athene cunicularia	Burrowing Owl			G4	S3B	GCPM-UP	GCPM-MID	GCPM-LWR
Asio flammeus	Short-eared Owl			G5	S4N	GCPM-UP	GCPM-MID	GCPM-LWR
Dendroica cerulea	Cerulean Warbler			G4	SHB,S3N	GCPM-UP	GCPM-MID	GCPM-LWR
Ammodramus maritimus	Seaside Sparrow			G4	S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Caprimulgus carolinensis	Chuck-will's-widow			G5	S3S4B	GCPM-UP	GCPM-MID	
Dryocopus pileatus	Pileated Woodpecker			G5	S4B	GCPM-UP	GCPM-MID	

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Poecile carolinensis	Carolina Chickadee			G5	S5B	GCPM-UP	GCPM-MID	
Thryomanes bewickii (bewickii)	Bewick's Wren			G5	S5B	GCPM-UP	GCPM-MID	
Cistothorus platensis	Sedge Wren			G5	S4	GCPM-UP	GCPM-MID	
Protonotaria citrea	Prothonotary Warbler			G5	S3B	GCPM-UP	GCPM-MID	
Limnothlypis swainsonii	Swainson's Warbler			G4	S3B	GCPM-UP	GCPM-MID	
Seiurus motacilla	Louisiana Waterthrush			G5	S3B	GCPM-UP	GCPM-MID	
Ammodramus henslowii	Henslow's Sparrow			G4	S2S3N,SXB	GCPM-UP	GCPM-MID	
Euphagus carolinus	Rusty Blackbird			G4	S3	GCPM-UP	GCPM-MID	
Elanoides forficatus	Swallow-tailed Kite		T	G5	S2B	GCPM-UP		
Hylocichla mustelina	Wood Thrush			G5	S4B	GCPM-UP		
Dendroica dominica	Yellow-throated Warbler			G5	S4B	GCPM-UP		
Helmitheros vermivorum	Worm-eating Warbler			G5	S3B	GCPM-UP		
Pelecanus erythrorhynchos	American White Pelican			G4	S2B,S3N		GCPM-MID	GCPM-LWR
Parabuteo unicinctus	Harris's Hawk			G5	S3B		GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Falco femoralis	Aplomado Falcon	E	E	G4	S1		GCPM-MID	GCPM-LWR
Camptostoma imberbe	Northern Beardless-Tyrannulet		T	G5	S3B		GCPM-MID	GCPM-LWR
Anthus spragueii	Sprague's Pipit	C		G4	S3N		GCPM-MID	GCPM-LWR
Parula pitiayumi	Tropical Parula		T	G5	S3B		GCPM-MID	GCPM-LWR
Aimophila cassinii	Cassin’s Sparrow			G5	S4B		GCPM-MID	GCPM-LWR
Aimophila botterii	Botteri's Sparrow		T	G4	S3B		GCPM-MID	GCPM-LWR
Tympanuchus cupido attwateri	Greater Prairie-Chicken (Attwater's)	LE	E	G4T1	S1B		GCPM-MID	
Grus americana	Whooping Crane	LE, XN	E	G1	S1		GCPM-MID	
Charadrius montanus	Mountain Plover	PT		G3	S2		GCPM-MID	
Onychoprion fuscatus	Sooty Tern		T	G5	S2B		GCPM-MID	
Zonotrichia querula	Harris's Sparrow			G5	S4		GCPM-MID	
Callipepla squamata	Scaled Quail			G5	S4B			GCPM-LWR
Chondrohierax uncinatus	Hook-billed Kite			G4	S2			GCPM-LWR
Buteogallus anthracinus	Common Black-Hawk		T	G4G5	S2B			GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Buteo nitidus	Gray Hawk		T	G5	S2B			GCPM-LWR
Aratinga holochlora	Green Parakeet			G3	S3			GCPM-LWR
Amazona viridigenalis	Red-crowned Parrot			G2	S2			GCPM-LWR
Glaucidium brasilianum	Ferruginous Pygmy-Owl		T	G5	S3B			GCPM-LWR
Geothlypis trichas	Common Yellowthroat			G5	S5B			GCPM-LWR
REPTILES AND AMPHIBIANS	*see also Marine Reptiles (sea turtles)*							
Apalone spinifera	spiny softshell turtle					GCPM-UP	GCPM-MID	GCPM-LWR
Ophisaurus attenuatus	western slender glass lizard					GCPM-UP	GCPM-MID	GCPM-LWR
Pseudacris streckeri	Strecker's Chorus Frog			G5	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Terrapene carolina	Eastern box turtle			G5	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Terrapene ornata	Ornate box turtle			G5	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Trachemys scripta	Red-eared slider					GCPM-UP	GCPM-MID	GCPM-LWR
Crotalus atrox	Western diamondback rattlesnake				S4	GCPM-UP	GCPM-MID	GCPM-LWR
Heterodon nasicus	Western hognosed snake					GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Hypopachus variolosus	sheep frog		T	G5	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Phrynosoma cornutum	Texas horned lizard		T	G4G5	S4	GCPM-UP	GCPM-MID	GCPM-LWR
Cheylydra serpentina	Common snapping turtle					GCPM-UP	GCPM-MID	
Crotalus horridus	Timber (Canebrake) Rattlesnake		T	G4	S4	GCPM-UP	GCPM-MID	
Macrochelys temminckii	alligator snapping turtle		T	G3G4	S3	GCPM-UP	GCPM-MID	
Pseudacris fouquettei (triseriata/feriarum)	Cajun chorus frog				SU	GCPM-UP	GCPM-MID	
Apalone mutica	smooth softshell turtle					GCPM-UP		
Cemophora coccinea copei	Northern Scarlet Snake		T	G5T5	S3	GCPM-UP		
Opheodrys (Liochlorophis) vernalis	smooth green snake				SX	GCPM-UP		
Lithobates areolatus (Rana areolata)	Crawfish frog				SU	GCPM-UP?	GCPM-MID	GCPM-LWR
Cemophora coccinea lineri	Texas Scarlet Snake		T	G5T2	S1S2		GCPM-MID	GCPM-LWR
Gopherus berlandieri	Texas tortoise		T	G4	S2*		GCPM-MID	GCPM-LWR
Holbrookia maculata propinqua	Eastern earless lizard				SX		GCPM-MID	GCPM-LWR
Notophthalmus meridionalis	black-spotted Newt		T	G1	S1 or S2?		GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Siren sp.	Rio Grande Siren (large form)		T	GNRQ	S2		GCPM-MID	GCPM-LWR
Sistrurus catenatus	massasagua						GCPM-MID	GCPM-LWR
Coniophanes imperialis	black-striped Snake		T	G4G5	S2			GCPM-LWR
Drymobius margaritiferus	speckled racer		T	G5	S1			GCPM-LWR
Leptodactylus fragilis	white-lipped Frog		T	G5	S1			GCPM-LWR
Leptodeira septentrionalis septentrionalis	northern cat-eyed snake		T	G5T5	S2			GCPM-LWR
Rena dulcis	Texas blind snake							GCPM-LWR
Rhinophrynus dorsalis	Mexican burrowing toad		T	G5	S2			GCPM-LWR
Smilisca baudinii	Mexican Treefrog		T	G5	S3			GCPM-LWR
Tantilla atriceps	Mexican blackhead snake							GCPM-LWR
FRESHWATER FISHES								
Anguilla rostrata	American eel			G4	S5	GCPM-UP	GCPM-MID	GCPM-LWR
Atractosteus spatula	alligator gar					GCPM-UP	GCPM-MID	GCPM-LWR
Notropis atrocaudalis	Blackspot shiner					GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Notropis shumardi	Silverband shiner					GCPM-UP	GCPM-MID	GCPM-LWR
Cycleptus elongatus	Blue sucker		T	G3G4	S3	GCPM-UP	GCPM-MID	
Polyodon spathula	Paddlefish		T	G4	S3	GCPM-UP		
Micropterus treculii	Guadalupe bass			G3	S3		GCPM-MID	
Percina apristis	Guadalupe darter						GCPM-MID	
Cycleptus sp.	(na)							GCPM-LWR
Hybognathus amarus	Rio Grande silvery minnow	LE	E	G1G2	SX			GCPM-LWR
Notropis braytoni	Tamaulipas shiner							GCPM-LWR
BAYS-ESTUARIES FISHES								
Awaous banana	River goby		T	G5	S1			GCPM-LWR
Centropomus parallelus	Fat snook					GCPM-UP	GCPM-MID	GCPM-LWR
Centropomus undecimalis	Common snook					GCPM-UP	GCPM-MID	GCPM-LWR
Ctenogobius claytonii	Mexican goby		T	G3	S1			GCPM-LWR
Fundulys jenkensi	saltmarsh topminnow	C				GCPM-UP	GCPM-MID	GCPM-LWR?

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Magalops atlanticus	Atlantic tarpon					GCPM-UP	GCPM-MID	GCPM-LWR
Menidia clarkhubbsi	Unisexual silverside					GCPM-UP	GCPM-MID	
Microphis brachyurus	Opossum pipefish		T	G4G5	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Paralichthys leghostigma	Southern flounder					GCPM-UP	GCPM-MID	GCPM-LWR
MARINE FISHES								
Epinephalus drummondhayi	Yellowedge grouper					GCPM-UP	GCPM-MID	GCPM-LWR
Epinephalus itajara	Goliath grouper (jewfish)					GCPM-UP	GCPM-MID	GCPM-LWR
Epinephalus morio	Red grouper					GCPM-UP	GCPM-MID	GCPM-LWR
Istiophorus platypterus	Sailfish					GCPM-UP	GCPM-MID	GCPM-LWR
Lutjanus campechanus	Red snapper					GCPM-UP	GCPM-MID	GCPM-LWR
Makaira nigrican	Blue marlin					GCPM-UP	GCPM-MID	GCPM-LWR
Mycteroperca bonaci	Black grouper					GCPM-UP	GCPM-MID	GCPM-LWR
Mycteroperca microlepis	Gag grouper					GCPM-UP	GCPM-MID	GCPM-LWR
Mycteropterca phenax	Scamp					GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Pristis pectinata	Smalltooth sawfish	LE	E	G1G3	SNR	GCPM-UP	GCPM-MID	
Pristis Perotteti	Largetooth sawfish	LE	E			GCPM-UP		
Rachycentron canadum	Cobia					GCPM-UP	GCPM-MID	GCPM-LWR
Rhinobatos lentiginosus	Atlantic guitarfish					GCPM-UP	GCPM-MID	GCPM-LWR
Rhomboplites aurorubens	Vermilion snapper					GCPM-UP	GCPM-MID	GCPM-LWR
Scomeromorus cavalla	King mackerel					GCPM-UP	GCPM-MID	GCPM-LWR
Scomeromorus maculatus	Spanish mackerel					GCPM-UP	GCPM-MID	GCPM-LWR
Seriola dumerili	Greater amberjack					GCPM-UP	GCPM-MID	GCPM-LWR
Tetrapturus albidus	White marlin					GCPM-UP	GCPM-MID	GCPM-LWR
Tetrapturus pfluegeri	Longbill spearfish					GCPM-UP	GCPM-MID	GCPM-LWR
Thunnus albacares	Yellowfin tuna					GCPM-UP	GCPM-MID	GCPM-LWR
Thunnus thynnus	Bluefin tuna					GCPM-UP	GCPM-MID	GCPM-LWR
Xiphias gladius	Swordfish					GCPM-UP	GCPM-MID	GCPM-LWR
MARINE FISHES: SHARKS								

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Alopias superciliosus	Bigeye thresher shark					GCPM-UP	GCPM-MID	GCPM-LWR
Alopias vulpinus	Thresher shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus acronotus	Blacknose shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus altimus	Bignose shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus brachyurus	Narrowtooth shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus brevipinna	Spinner shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus falciformis	Silky shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus galapagensis	Galapagos shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus isodon	Finetooth shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus leucas	Bull shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus limbatus	Blacktip shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus longimanus	Oceanic whitetip shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus obscurus	Dusky shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus perezi	Caribbean reef shark					GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Carcharhinus plumbeus	Sandbar shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus porosus	Smalltail shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharhinus signatus	Night shark					GCPM-UP	GCPM-MID	GCPM-LWR
Carcharodon carcharias	White shark					GCPM-UP	GCPM-MID	GCPM-LWR
Cetorhinus maximus	Basking shark					GCPM-UP	GCPM-MID	GCPM-LWR
Galeorhinus cuvier	Tiger shark					GCPM-UP	GCPM-MID	GCPM-LWR
Ginglymostoma cirratum	Nurse shark					GCPM-UP	GCPM-MID	GCPM-LWR
Hexanchus griseus	Sixgill shark					GCPM-UP	GCPM-MID	GCPM-LWR
Hexanchus nakamurai	Bigeye sixgill shark					GCPM-UP	GCPM-MID	GCPM-LWR
Isurus oxyrinchus	Shortfin mako shark					GCPM-UP	GCPM-MID	GCPM-LWR
Isurus paucus	Longfin mako shark					GCPM-UP	GCPM-MID	GCPM-LWR
Lamna nasus	Porbeagle shark					GCPM-UP	GCPM-MID	GCPM-LWR
Negaprion brevirostris	Lemon shark					GCPM-UP	GCPM-MID	GCPM-LWR
Notorynchus cepedianus	Sevengill shark					GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Odontaspis noronhai	Bigeye sand tiger shark					GCPM-UP	GCPM-MID	GCPM-LWR
Odontaspis taurus	Sand tiger shark					GCPM-UP	GCPM-MID	GCPM-LWR
Prionace glauca	Blue shark					GCPM-UP	GCPM-MID	GCPM-LWR
Rhincodon typus	Whale shark					GCPM-UP	GCPM-MID	GCPM-LWR
Rhizoprinodon porosus	Caribbean sharpnose shark					GCPM-UP	GCPM-MID	GCPM-LWR
Rhizoprinodon terranovae	Atlantic sharpnose shark					GCPM-UP	GCPM-MID	GCPM-LWR
Sphyrna lewini	Scalloped hammerhead shark					GCPM-UP	GCPM-MID	GCPM-LWR
Sphyrna mokorran	Great hammerhead shark					GCPM-UP	GCPM-MID	GCPM-LWR
Sphyrna tiburo	Bonnethead shark					GCPM-UP	GCPM-MID	GCPM-LWR
Sphyrna zygaena	Smooth hammerhead shark					GCPM-UP	GCPM-MID	GCPM-LWR
Squatina dumeril	Atlantic angel shark					GCPM-UP	GCPM-MID	GCPM-LWR
MARINE REPTILES								
Caretta caretta	loggerhead sea turtle	LT	T	G3	S4	GCPM-UP	GCPM-MID	GCPM-LWR
Chelonia mydas	green sea turtle	LT	T	G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Dermochelys coriacea	leatherback sea turtle	LE	E	G3	S1S2	GCPM-UP	GCPM-MID	GCPM-LWR
Eretmochelys imbricata	hawksbill sea turtle	LE	E	G3	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Lepidochelys kempii	Kemp's ridley sea turtle	LE	E	G1	S3	GCPM-UP	GCPM-MID	GCPM-LWR
MARINE MAMMALS								
Balaenoptera musculus	Blue whale	LE		G2	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Balaenoptera physalus	Finback whale	LE	E	G3G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Eubalaena glacialis	Black right whale	LE		G1	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Feresa attenuata	Pygmy killer whale		T	G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Globicephala macrorhynchus	Short-finned pilot whale		T	G5	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Kogia breviceps	Pygmy sperm whale		T	G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Kogia simus	Dwarf sperm whale		T	G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Megaptera novaeangliae	Humpback Whale	LE	E	G3	SNR	GCPM-UP	GCPM-MID	GCPM-LWR
Mesoplodon europaeus	Gervais beaked whale		T	G3	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Orcinus orca	Killer whale		T	G4G5	S1	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Physeter macrocephalus	Sperm whale	LE		G3G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Pseudorca crassidens	False killer whale		T	G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Stenella frontalis	Atlantic spotted dolphin		T	G5	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Steno bredanensis	Rough-toothed dolphin		T	G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Trichechus manatus	West Indian manatee	LE	E	G2	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Tursiops truncatus	Atlantic bottlenose dolphin			G5	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Ziphius cavirostris	Goose-beaked whale		T	G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
INVERTEBRATES								
Bombus pensylvanicus	American bumblebee			GU	SU*	GCPM-UP	GCPM-MID	GCPM-LWR
Cisthene conjuncta	A lichen moth			G1Q	S1Q*	GCPM-UP	GCPM-MID	GCPM-LWR
Pogonomyrmex comanche	Comanche harvester ant			G2G3*	S2*	GCPM-UP	GCPM-MID	GCPM-LWR
Adetus n. sp. EGR 1	A longhorned beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Agapema galbina	Tamaulipan Agapema			G1	SH	GCPM-UP	GCPM-MID	GCPM-LWR
Agrilus dollii	A metallic wood-boring beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Agrilus subtropicus	A metallic wood-boring beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Allopentarthrum n. sp. TAC 1	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Allopentarthrum n. sp. TAC 2	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Andranthobius n. sp. TAC 1	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Apenes n. sp. UASM 11	A ground beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Apteromechus texanus	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Baliosus n. sp. EGR 1	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Berginus n. sp. EGR 1	A hairy fungus beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Brucita marmorata	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Cacostola lineata	A longhorned beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Calleida fimbriata	A ground beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Callipogonius cornutus	A longhorned beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Cenophengus pallidus	A glowworm beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Chaetocnema rileyi	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Chalcodermus semicostatus	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Colletes saritensis	A cellophane bee			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Conotrachelus rubescens	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Cotinis boylei	A scarab beetle			G2*	S2*	GCPM-UP	GCPM-MID	GCPM-LWR
Cryptocephalus downiei	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Dacoderus steineri	A narrow-waisted bark beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Diomus pseudotaedatus	A lady beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Disonycha barberi	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Disonycha stenosticha	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Elleschus n. sp. TAC 1	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Epitrix n. sp. EGR 1	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Eubulus n. sp. TAC 1	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Euphyes bayensis	Bay skipper			G1G3	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Hapalips texanus	A lizard beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Haplostethops n. sp. TAC 1	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Heliastus subroseus	A grasshopper			G2G3	S2?*	GCPM-UP	GCPM-MID	GCPM-LWR
Heptispa n. sp. EGR 1	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Heterobrenthus texanus	A straight-snouted weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Hyperaspis rotunda	A lady beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Lachnodactyla texana	A toe-winged beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Lampsilis bracteata	Texas fatmucket		T	G1	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Loberus ornatus	A lizard beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Megascelis texana	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Nesovitrea suzannae	Live oak glass			G1	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Notolomus n. sp. TAC 1	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Notolomus n. sp. TAC 2	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Omiscus irroratus	A fungus weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Ormiscus albofasciatus	A fungus weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Pachybrachis duryi	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Pachybrachis n. sp. EGR 2	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Pachybrachis n. sp. EGR 6	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Pachyschelus fisheri	A metallic wood-boring beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Pentispa distincta	A leaf beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Perdita fraticincta	A mining bee			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Phoenicobiella schwarzii	A fungus weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Platyomus flexicaulis	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Plauditus texanus	A mayfly			G2G3	S1?*	GCPM-UP	GCPM-MID	GCPM-LWR
Plocetes versicolor	A weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Ptinus tumidus	A spider beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Quadrula aurea	Golden orb		T	G1	S2*	GCPM-UP	GCPM-MID	GCPM-LWR
Quadrula mitchelli	False Spike		T	GH	SH	GCPM-UP	GCPM-MID	GCPM-LWR
Rhypasma n. sp. EGR 1	A darkling beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Spectralia prosternalis	A metallic wood-boring beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Sphingicampa blanchardi	A royal moth			G1	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Streptocephalus mattoxi	Crenatethumb fairy shrimp			G1	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Talanus mecoselis	A darkling beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Toramus chamaeropis	A lizard beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Tortopus circumfluus	A mayfly			G1G3	S2?*	GCPM-UP	GCPM-MID	GCPM-LWR
Toxonotus penicellatus	A fungus weevil			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Trichodesma pulchella	A death-watch beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Trichodesma sordida	A death-watch beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Tricorynus texanus	A death-watch beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Trigonogya reticulaticollis	A metallic wood-boring beetle			G1*	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Trimerotropis schaefferi	A grasshopper			G2G3	S2?*	GCPM-UP	GCPM-MID	GCPM-LWR
Truncilla macrodon	Texas fawnsfoot		T	G2Q	S1*	GCPM-UP	GCPM-MID	GCPM-LWR
Fallicambarus houstonensis	Houston burrowing crayfish			G2G3*	S2S3*	GCPM-UP		

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Cicindela obsoleta neojuvenilis	Neojuvenile tiger beetle			G5T1	SH		GCPM-MID	GCPM-LWR
Decinea percosius	Percosius skipper			G1G3	S1S3*		GCPM-MID	GCPM-LWR
Dichopetala gladiator	Gladiator short-winged katydid			G2?*	S2?*		GCPM-MID	GCPM-LWR
Anomala tibialis	Padre Island tibial scarab			GH	SH			GCPM-LWR
Arethaea phantasma	Rio Grande Thread-legged katydid			G2?*	S2?*			GCPM-LWR
Bombus sonorus	Sonoran bumblebee			GU	SU*			GCPM-LWR
Cicindela nigrocoerulea subtropica	Subtropical black sky tiger beetle			G5T2	SH			GCPM-LWR
Conocephalus resacensis	Brownsville meadow katydid			G2?*	S2?*			GCPM-LWR
Daedalochila scintilla	Liptooth land snail			G1	S1*			GCPM-LWR
Dichopetala pollicifera	Thumb-bearing short-winged katydid			G1?*	S1?*			GCPM-LWR
Euglandina texasiana	Glossy wolfsnail			G1G2	S1S2*			GCPM-LWR
Eximacris (Spharoagemon) superbum	Superb grasshopper			G1?*	S1?*			GCPM-LWR
Praticolella candida	white scrubsnail			G2	S2*			GCPM-LWR
PLANTS							GCPM-MID	

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Coreopsis nuecensis	crown tickseed			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Crataegus anamesa	Fort Bend hawthorn			G3Q	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Cuscuta attenuata	marsh-elder dodder			G3	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Echinacea atrorubens	Topeka purple-coneflower			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Paronychia setacea	bristle nailwort			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Platanthera chapmanii	Chapman's orchid			G2	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Abronia ameliae	Amelia's Sand-verbena			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Adelia vaseyi	Vasey's adelia			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Allium canadense var. ecristatum	crestless onion			G5T3Q	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Ambrosia cheiranthifolia	South Texas ambrosia	LE	E	G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Atriplex klebergorum	Kleberg saltbush			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Ayenia limitaris	Texas ayenia	LE	E	G2	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Bothriochloa exaristata	awnless bluestem			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Brazoria arenaria	sand Brazos mint			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Cardiospermum dissectum	Chihuahua balloon-vine			G2G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Chaetopappa imberbis	awnless leastdaisy			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Crataegus poliophylla	rosemay hawthorn			G3Q	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Crataegus viburnifolia	sawtooth Hawthorn			G3Q	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Croton coryi	Cory's croton			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Cuscuta exaltata	tree dodder			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Cyperus cephalanthus	giant sharpstem umbrella-sedge			G2Q	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Dalea austrotexana	dune dalea			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Echeandia chandleri	lila de los llanos			G2G3	S2S3	GCPM-UP	GCPM-MID	GCPM-LWR
Echeandia texensis	Green Island echeandia			G1	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Echinocereus papillosus	yellow-flowered alicoche			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Eleocharis austrotexana	South Texas spikesedge			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Eleocharis brachycarpa	short-fruited spikesedge			G1	SH	GCPM-UP	GCPM-MID	GCPM-LWR
Euphorbia innocua	velvet spurge			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Grindelia oolepis	plains gumweed			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Helianthus occidentalis subsp. plantagineus	Shinner's sunflower			G5T2T3	S2S3	GCPM-UP	GCPM-MID	GCPM-LWR
Helianthus praecox subsp. praecox	Texas sunflower			G4T2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Heteranthera mexicana	Mexican mud-plantain			G2G3	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Hoffmannseggia tenella	slender rushpea	LE	E	G1S1	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Houstonia croftiae	Croft's bluet			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Hymenoxys texana	Texas prairie dawn	LE	E	G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Justicia runyonii	Runyon's water-willow			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Leitneria floridana	corkwood			G3	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Lenophyllum texanum	Texas stonecrop			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Liatris bracteata	coastal gay-feather			G2G3	S2S3	GCPM-UP	GCPM-MID	GCPM-LWR
Manfreda sileri	Siler's huaco			G3	S3			GCPM-LWR
Matelea radiata	Falfurrias milkvine			GH	SH	GCPM-UP	GCPM-MID	GCPM-LWR
Oenothera pilosella ssp. sessilis	Grand Prairie evening primrose			G5T2	SH	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Paronychia jonesii	Jones' nailwort			G3G4	S3S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Paronychia lundellorum	Lundell's whitlow-wort			G1Q	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Physostegia correllii	Correll's false dragon-head			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Polanisia erosa subsp. breviglandulosa	South Texas yellow clammyweed			G5T3T4	S3S4B	GCPM-UP	GCPM-MID	GCPM-LWR
Prunus texana	Texas peachbush			G3G4	S3S4	GCPM-UP	GCPM-MID	GCPM-LWR
Pseudognaphalium austrotexanum	South Texas false cudweed			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Psilactis heterocarpa	Welder machaeranthera			G2G3	S2S3	GCPM-UP	GCPM-MID	GCPM-LWR
Rayjacksonia aurea	Houston daisy			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Rhynchospora indianolensis	Indianola beakrush			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Rudbeckia scabrifolia	bog coneflower			G2G3	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Schoenoplectus deltarum	Delta bulrush			G3G4	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Selenia grandis	large selenia			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Sporobolus tharpii	Tharp's dropseed			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Tauschia texana	Texas tauschia			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Thalictrum texanum	Texas meadow-rue			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Thelypodiopsis shinnersii	Shinner's rocket			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Thurovia triflora	threeflower broomweed			G2G3	S2S3	GCPM-UP	GCPM-MID	GCPM-LWR
Tradescantia buckleyi	Buckley's spiderwort			G3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Trichocoronis wrightii var. wrightii	Wright's trichocoronis			G4T3	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Willkommia texana var. texana	Texas willkommia			G4T3	S3	GCPM-UP	GCPM-MID	GCPM-LWR
Zephyranthes refugiensis	Refugio rainlily			G2	S2	GCPM-UP	GCPM-MID	GCPM-LWR
Zephyranthes smallii	Small's rainlilly			G1Q	S1	GCPM-UP	GCPM-MID	GCPM-LWR
Zephyranthes traubii	Traub's rainlilly			G3Q	S3	GCPM-UP	GCPM-MID	
Chloris texensis	Texas windmill grass			G2	S2	GCPM-UP		
Calopogon oklahomensis	Oklahoma grass pink			G3	S1S2	GCPM-UP		
Polygala hookeri	Hooker's milkwort			G3	S2		GCPM-MID	GCPM-LWR
Echinocereus reichenbachii var. albertii	black lace cactus	LE	E	G5T1Q	S1		GCPM-MID	
Monarda maritima	seaside beebalm			G3Q	S3		GCPM-MID	

Scientific Name	Common Name	Status		Abundance Ranking				
			State	Global	State	GCPM-UP	GCPM-MID	(GCPM-LWR)
Rhododon angulatus	Tharp's rhododon			G1Q	S1			GCPM-LWR
Pomaria austrotexana	stinking rushpea			G3	S3			GCPM-LWR
Sesuvium trianthemoides	roughseed sea-purslane			GH	SH			

Table 4. GCPM Rare Communities

Note Table is formatted 11" X 17", more information is available on the Rare Communities table posted on the website.

G_RANK	S_RANK (Provisional)	COMMON_NAME	GLOBAL_NAME	ECOLOGICAL SYSTEM_NAME	KNOWN COUNTIES	Endemic	KNOWN PROTECTED AREAS
G1G2	S1S2	Sugarberry - Cedar Elm - (Rio Grande Ash) / Pigeonberry - Crucita Forest	Celtis laevigata - Ulmus crassifolia - (Fraxinus berlandieriana) / Rivina humilis - Chromolaena odorata Forest	Tamaulipan Floodplain CES301.990	Brooks, Cameron, Hidalgo, Kenedy, Nueces, Jim Wells, Kleberg, and Willacy	N	Lower Rio Grande and Santa Anna NWR (USFWS)
G1	S1	Tamaulipan Maritime Shrubland B16	Citharexylum berlandieri - Yucca treculeana - Ebenopsis ebano - Phaulothamnus spinescens Shrubland	South Texas Lomas CES301.462	Cameron and Hidalgo	N	Laguna Atascosa NWR & Lower Rio Grande NWR (USFWS)
G1	S1	Texas Ebony Resaca Forest	Ebenopsis ebano - Ehretia anacua / Condalia hookeri Forest	Tamaulipan Floodplain CES301.990	Cameron and Hidalgo	N	Las Palomas NWR, Lower Rio Grande NWR, and Santa Ana NWR (USFWS)
G1G2	S1S2	Curly-mesquite - Sideoats Grama - Buffalo Grass - Texas Wintergrass Herbaceous Vegetation	Hilaria belangeri - Bouteloua curtipendula - Buchloe dactyloides-Nasella leucotricha-Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	Nueces, Kleberg, and Jim Wells	N	No protected areas (Robstown, TX area)
G2G3	S2S3	Shoregrass Herbaceous Vegetation	Monanthochloe littoralis Herbaceous Vegetation	Central and Upper Texas Coast Salt and Brackish Tidal Marsh CES203.473	Aransas, Brazoria, Brooks, Calhoun, Cameron, Chambers, Galveston, Gonzales, Hidalgo, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio, and Willacy	N	Anahuac NWR (USFWS), Aransas NWR (USFS), Brazoria NWR (USFWS); Candy Abshier WMA (TPWD), Mad Island Preserve (TNC), Mad Island WMA (TPWD), San Benard Brazoria NWR (USFWS), Mustang Island SP (TPWD), Matagorda WMA (TPWD), and Padre Island National Seashore (NPS)..
G2	S2	Coastal Mesquite / Cactus Woodland	Prosopis glandulosa / Acanthocereus tetragonus Woodland	Tamaulipan Mixed Deciduous Thornscrub CES301.983	Cameron, Kleberg, Webb, and Willacy	N	No documented protected areas
G2G3	S2	Tamaulipan Mesquite Brushland	Prosopis glandulosa var. glandulosa / (Celtis pallida, Phaulothamnus spinescens, Ziziphus obtusifolia var. obtusifolia) Woodland	Tamaulipan Mixed Deciduous Thornscrub CES301.983	Cameron and Hidalgo	N	Lower Rio Grande NWR, and Santa Ana NWR (USFWS)
G2G3	S2S3	Seaside Bluestem - Brownseed Crowngrass Texas Sand Sheet Herbaceous Vegetation	Schizachyrium littorale - Paspalum plicatulum Texas Sand Sheet Herbaceous Vegetation	South Texas Sand Sheet Grassland CES301.538	Brooks, Hidalgo, Kenedy, Kleberg, Jim Hogg, Starr, and Willacy	Y	No documented protected areas
G2	S2	Cenizo - Mejorana - Redbrush Lippia Shrubland	Leucophyllum frutescens - Salvia ballotiflora - Lippia graveolens Shrubland	Tamaulipan Calcareous Thornscrub CES301.983	Hidalgo, Starr, and Val Verde	N	Amistad NWR (USFWS)
G2G3	S2	Lower Rio Bravo/Rio Grande Riparian Willow Shrubland	Salix interior / Phragmites australis Temporarily Flooded Shrubland	Tamaulipan Floodplain CES301.990	Cameron, Hidalgo, and Starr	N	Bentsen-Rio Grande State Park (TPWD), Las Palomas NWR, Lower Rio Grande NWR, and Santa Ana NWR (USFWS)
G2G3	S2S3	Lower Rio Grande Valley Black Willow Forest	Salix nigra - Celtis laevigata var. laevigata / Baccharis neglecta Forest	Tamaulipan Floodplain CES301.990	Cameron, Hidalgo, Kenedy, Kleberg, and Starr, Webb, and Zapata	Y	Bentsen-Rio Grande State Park (TPWD), Las Palomas NWR, Lower Rio Grande NWR, and Santa Ana NWR (USFWS)

G_RANK	S_RANK (Provisional)	COMMON_NAME	GLOBAL_NAME	ECOLOGICAL SYSTEM_NAME	KNOWN COUNTIES	Endemic	KNOWN PROTECTED AREAS
G2	S2	Texas Ebony - Snake Eyes Shrubland [B16]	Ebenopsis ebano - Phaulothamnus spinescens Shrubland	South Texas Lomas CES301.462	Brooks, Cameron, Hidalgo, Jim Hogg, Jim Wells, Kenedy, Kleberg, McMullen. Starr, Webb, Willacy, and Zapata	N	Lower Rio Grande NWR, (USFWS) and Los Palomas WMA (TPWD)
G2G3	S1	Huisache - Spiny Florida Prickly-pear - Gulf Coast Wolfberry / Saltmeadow Cordgrass Shrubland	Acacia farnesiana - Opuntia stricta var. dillenii - Lycium carolinianum var. quadrifidum / Spartina patens Shrubland	West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland CES203.466	Chambers and Jefferson	N	Mc Faddin NWR (USFWS)
G1	S1	Eastern Upland Coastal Prairie	Andropogon gerardii - Panicum virgatum - Schizachyrium scoparium - Schizachyrium tenerum - Helianthus mollis Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	*Potentially in Chambers, Jefferson, or Liberty*	N	No protected areas. Not sure if remnants still exist in Texas. Only r-o-w examples exist in Jefferson County.
G2G3	S2S3	Black Mangrove Shrubland [B17]	Avicennia germinans / Spartina alterniflora Shrubland	Central and Upper Texas Coast Salt and Brackish Tidal Marsh CES203.473	Aransas, Cameron, Calhoun, Galveston, Jefferson, Kleberg, Nueces, San Patricio, and Willacy	N	Aransas NWR (USFWS), Matagorda Island WMA (TPWD), Mustang Island SP (TPWD), Packery Channel County Park (City of Corpus Christi), and Padre Island National Seashore (NPS)
GH	SH	Cane Bluestem - False Rhodesgrass Mixedgrass Prairie	Bothriochloa barbinodis - Chloris pluriflora Herbaceous Vegetation	Ecological System: Apacherian-Chihuahuan Semi-Desert Grassland and Steppe System CES302.735	Cameron and Kleberg	N	No remnants
G1	S1	Marsh-fringing Coastal Prairie	Euthamia leptocephala - Helianthus angustifolius - Boltonia asteroides - Spartina patens Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	Chambers	N	Mc Faddin NWR
G2	S2	Columbia Bottomlands Ash Flat	Fraxinus pennsylvanica - (Carya aquatica) / Forestiera acuminata / Phanopyrum gymnocarpon Depression Forest		Brazoria, Fort Bend, and Wharton	Y	San Bernard NWR (USFWS) and Stringfellow WMA (TPWD)
G2	S2	Southern Umbrella-sedge - Long Umbrella-sedge - Southern Beaksedge - Spreading Beaksedge Herbaceous Vegetation	Fuirena scirpoidea - Fuirena longa - Rhynchospora microcarpa - Rhynchospora divergens Herbaceous Vegetation	Southeastern Coastal Plain Interdunal Wetland CES203.258	Aransas, Nueces, Refugio, San Patricio, and Kleberg	Y	Aransas NWR (USFWS), Ingleside Naval Air Station (DoD), and Padre Island National Seashore (NPS).
G2G3	S2S3	Gutta-percha Mayten - Creeping Mesquite / Saltmeadow Cordgrass Herbaceous Vegetation [B16]	Maytenus phyllanthoides - Prosopis reptans / Spartina patens Herbaceous Vegetation	South Texas Lomas CES301.462	Aransas, Cameron, Kenedy, Kleberg, Nueces, San Patricio, and Willacy	N	Laguna Atascosa NWR (USFWS) & Lower Rio Grande Valley NWR (USFWS)
G1	S1	Houston Coastal Prairie	Muhlenbergia capillaris Herbaceous Vegetation	Texas Saline Coastal Prairie CES203.543	Ft. Bend, Galveston, and Harris	Y	Addicks/Barker Reservoir (COE), Houston County Parks (City of Houston), and Katy Prairie Preserve (KPC)
G1	S1	Wet Coastal Prairie/Marsh	Panicum virgatum - Tripsacum dactyloides - (Panicum hemitomon) Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	Brazoria	N	Brazoria NWR (USFWS)

G_RANK	S_RANK (Provisional)	COMMON_NAME	GLOBAL_NAME	ECOLOGICAL SYSTEM_NAME	KNOWN COUNTIES	Endemic	KNOWN PROTECTED AREAS
G2	S1	Seashore Crowngrass - Saltmeadow Cordgrass Oligohaline Herbaceous Vegetation	Paspalum vaginatum - Spartina patens Oligohaline Herbaceous Vegetation	Gulf Coast Chenier Plain Fresh and Oligohaline Tidal Marsh CES203.467	Chambers, Galveston, and Jefferson	N	No documented protected areas
G2	S2	Texas Coastal Bend Live Oak - Redbay Forest	Quercus fusiformis - Persea borbonia Forest	Central and South Texas Coastal Fringe Forest and Woodland CES203.464	Aransas, Calhoun, Nueces, Refugio, and San Patricio	Y	Aransas NWR (USFWS), Ingleside Naval Station (DoD)
G2G3	S2S3	South Texas Sand Sheet Oak Motte Forest	Quercus fusiformis - Prosopis glandulosa var. glandulosa / Malvaviscus arboreus var. drummondii Forest	South Texas Sand Sheet Grassland CES301.538	Brooks and Kenedy	Y	No documented protected areas
G2G3	S2S3	Texas Gulf Coast Live Oak - Sugarberry Forest	Quercus virginiana - (Celtis laevigata) / Prunus caroliniana Forest	West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland CES203.466	Brazoria, Chambers, Galveston, Jefferson, and Matagorda	Y	Candy Abshier WMA (TPWD)
G2G3	S1	Gulf Coast Shell Midden Woodland	Quercus virginiana - (Juniperus virginiana) - Zanthoxylum clava-herculis / Sideroxylon lanuginosum Woodland	East Gulf Coastal Plain Maritime Forest CES203.503	Brazoria, Chambers, and Galveston	N	No documented protected areas
G2	S2	Live Oak - Pecan Woodland	Quercus virginiana - Carya illinoinensis Woodland		Austin, Brazoria, Colorado, Ft. Bend, Matagorda, and Wharton	Y	Attwater Prairie Chicken, San Bernard NWR (USFWS), and Stephen F. Austin SP (TPWD)
G2	S1	Coastal Louisiana Chenier Forest	Quercus virginiana - Celtis laevigata / Sabal minor Forest	West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland CES203.466	Chambers, Jefferson, and Liberty	N	Candy Abshier WMA (TPWD) and Trinity River NWR (USFWS)
G1	S1	Gulf Coast Salt Dome Hardwood Forest	Quercus virginiana - Magnolia grandiflora - Quercus pagoda - Celtis laevigata / Sabal minor Forest	West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland CES203.466	Chambers and Jefferson	N	High Island 's Smith's Oaks, Red Bay, and Boy Scout Woods Sanctuary (Houston Audubon), Sabine Woods (TX Ornithological Society)
G2G3	S2S3	Water Oak - Live Oak Forest	Quercus virginiana - Quercus nigra / Chasmanthium latifolium Forest		Austin, Brazoria, Colorado, Ft. Bend, Harris, Lavaca, Matagorda, Waller, and Wharton	Y	Addicks/Barker Reservoir, Attwater Prairie Chicken Refuge (USFWS), Brazos Bend State Park (TPWD), Katy Prairie Preserve (KPC), San Bernard NWR (USFWS), Stephen F. Austin State Park (TPWD), and Stringfellow WMA (TPWD)
G2G3	S2S3	Live Oak - Post Oak Woodland	Quercus virginiana - Quercus stellata / Schizachyrium scoparium - Paspalum plicatulum Woodland	East-Central Texas Plains Post Oak Savanna and Woodland CES205.679	Austin, Burleson, Colorado, Gonzales, Lavaca, Lee, Waller, and Washington	Y	No documented protected areas
G2G3	S2S3	Upper Texas Coast Live Oak Forest	Quercus virginiana / Ilex vomitoria - Sabal minor / Carex cherokeensis - Malvaviscus arboreus var. drummondii Forest		Austin, Brazoria, Colorado, Ft. Bend, Harris, Lavaca, Matagorda, Waller, and Wharton	Y	Addicks/Barker Reservoir, Attwater Prairie Chicken Refuge (USFWS), Brazos Bend State Park (TPWD), Katy Prairie Preserve (KPC), San Bernard NWR (USFWS), Stephen F. Austin State Park (TPWD), and Stringfellow WMA (TPWD)

G_RANK	S_RANK (Provisional)	COMMON_NAME	GLOBAL_NAME	ECOLOGICAL SYSTEM_NAME	KNOWN COUNTIES	Endemic	KNOWN PROTECTED AREAS
G1G2	S1S2	Subtropical Texas Palmetto Woodland	Sabal mexicana - Ebenopsis ebano Forest	Tamaulipan Palm Grove Riparian Forest CES301.991	Cameron	N	Sabal Palm Grove (Audubon Texas), and Southmost Preserve (TNC)
G1G2	S1S2	Alfisol Coastal Prairie	Schizachyrium scoparium - Paspalum plicatulum - Sorghastrum nutans - Dichanthelium oligosanthes - Paspalum setaceum - Symphyotrichum pratense Alfisol Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	Austin, Brazoria, Colorado, Chambers, Harris, Galveston, Jefferson, Matagorda, and Waller	Y	Addicks/Barker Reservoir (COE), Attwater Prairie Chicken Refuge (USFWS), Katy Prairie (KPC), and Candy Abshier WMA (TPWD)
G1	S1	Vertisol Coastal Prairie	Schizachyrium scoparium - Sorghastrum nutans - Paspalum plicatulum - Carex microdonta - Neptunia lutea Vertisol Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	Austin, Brazoria, Colorado, Chambers, Harris, Galveston, Jefferson, and Waller	Y	Attwater Prairie Chicken Refuge (USFWS)
G1	S1	Sandhill Coastal Prairie	Schizachyrium scoparium - Triplasis purpurea - Eriogonum multiflorum - Liatris elegans var. carizzana Herbaceous Vegetation	Texas-Louisiana Coastal Prairie CES203.550	Aransas, Calhoun, Nueces, Refugio, San Patricio, and Kleberg	Y	Aransas NWR (USFWS), Ingleside Naval Air Station (DoD), Mustang Island State Park (TPWD), and Padre Island National Seashore (NPS)
G2G3	S2	Texas Coastal Bend Interdune Swale Grassland [B15]	Spartina patens - Fimbristylis (caroliniana, castanea) - (Panicum virgatum) Herbaceous Vegetation	Southeastern Coastal Plain Interdunal Wetland CES203.258	Aransas, Calhoun, Kleberg, Nueces, Refugio, and San Patricio	N	Aransas NWR (USFWS), Ingleside Naval Station (DoD), Matagorda WMA (TPWD), and Padre Island National Seashore (NPS)
G2	S1	West Gulf Coastal Plain Cordgrass Dune Grassland [B15]	Spartina patens - Panicum amarum - Hydrocotyle bonariensis Herbaceous Vegetation	Central and Upper Texas Coast Dune and Coastal Grassland CES203.465	Chambers, Galveston, Harris, and Jefferson	N	No documented protected areas
G2	S1	Big Alkali Sacaton Marsh [B16]	Sporobolus wrightii Herbaceous Vegetation	South Texas Lomas CES301.462	Cameron	N	Lower Rio Grande Valley NWR (USFWS)
G2	S2	Columbia Bottomlands Bald-cypress Forest	Taxodium distichum - Fraxinus pennsylvanica Gallery Forest	West Gulf Coastal Plain Small Stream and River Forest CES203.487	Brazoria, Ft. Bend, Harris, Matagorda, and Wharton	Y	San Bernard NWR (USFWS) and Stringfellow WMA (TPWD)
G1	S1	Colima - Panalero - Chapote Matorral	Zanthoxylum fagara - Forestiera angustifolia - Diospyros texana Shrubland		Calhoun and Matagorda	N	Mad Island (TNC) and Matagorda Island (USFWS)

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 5. GCPM Priority Habitats

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

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
NATURAL AND SEMI-NATURAL TYPES	*Habitats in this column were identified in the workshops (Upper, Mid and Lower coast) and the April 2011 survey; additions were made by editor to riverine and cultural aquatic* *Note: "Rookery" was mentioned as a habitat type in the workshops; however, it is not included in this table as it is a USE or VALUE of a particular habitat (such as bottomland hardwood, oak mottes, marsh, mangroves, etc.), like hibernaculum is a use or value of some karst habitats.These will be further discussed in the Actions section and are covered in the Statewide Handbook under Colonial Species*	*NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications for Ecological Systems of Texas' Gulf Coast Prairies and Marshes. NatureServe Central Databases. Arlington, VA. U.S.A. Data current as of 08 October 2009.*
Barren/Sparse Vegetation *See also Marine/Coastal*	live dune fields (inland) salt domes (is this a habitat important to SGCN?) caliche outcroppings (lower coast)	*Habitats in this category were mentioned in workshops; may need to define a project to describe system for NatureServe*
Grassland	Upper: coastal midgrass prairie, coastal tall grass prairie Mid: coastal tallgrass prairie , shortgrass prairie (not much left) Lower: sand sheet grasslands, coastal prairie – tallgrass closer to the coast, midgrass prairies, short grass prairie ** South Texas Sandsheet Grassland is actually in the GCPM ecoregion; it is also included in STPL habitat types for this exercise as some practitioners are more familiar calling it a "south Texas" ecotype*.	South Texas Sand Sheet Grassland* Tamaulipan Caliche Grassland Tamaulipan Clay Grassland Tamaulipan Savanna Grassland Tamaulipan Tallgrass Grassland Texas Blackland Tallgrass Prairie Central and Upper Texas Coast Dune and Coastal Grassland (mixed upland and wetland) South Texas Dune and Coastal Grassland (mixed upland and wetland) Texas-Louisiana Coastal Prairie
Shrubland	Mid: Tamaulipan thornscrub (adjacent to South Texas Plains [STPL] ecoregion)	Tamaulipan Mixed Deciduous Thornscrub South Texas Lomas

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
	Lower (also adjacent to STPL): thorn shrublands (taller shrublands with shorter scrub-shrub), coastal scrub, lomas, other south Texas Plains shrublands (including mesquite, huisache, running liveoak and baccharis)	
Savanna/Open Woodland	Lower: sand sheet oak mottes All subsections: oak mottes, mature mesquite and huisache savanna	East-Central Texas Plains Post Oak Savanna and Woodland South-Central Saline Glade
Woodland	Upper: coastal mottes, upland hackberry-oak woodlands Mid and upper: live oak – red bay woodlands	Central and South Texas Coastal Fringe Forest and Woodland West Gulf Coastal Plain Chenier and Upper Texas Coastal Fringe Forest and Woodland
Forest *See also* Riparian *and* Wetlands	Upper: to limited extent oak pine forests which extend from the Western Gulf Coastal Plains ecoregion, near/north of Houston	West Gulf Coastal Plain Pine-Hardwood Forest

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
Riparian	periodically flooded or wet floodplains and tributary ravines and creekside vegetation Upper: Columbia Bottomlands, Coastal Flatwoods, Bottomland Hardwoods, cypress-tupelo , forested wetlands Mid: forested wetlands, riparian corridors – shrubland and woodland species (e.g. northern areas hackberry and ash, bottomland hardwood forests), cypress Lower: arroyos, ephemeral creek beds, oxbows (resacas), riparian mature gallery forest (e.g. ebony, Montezuma cypress), floodforests in old resaca beds, riparian shrubland, sabal palm forests	Southeastern Great Plains Floodplain Forest Southeastern Great Plains Riparian Forest Tamaulipan Arroyo Shrubland Tamaulipan Floodplain Tamaulipan Palm Grove Riparian Forest Texas-Louisiana Coastal Prairie Slough West Gulf Coastal Plain Flatwoods Pond West Gulf Coastal Plain Mesic Hardwood Forest West Gulf Coastal Plain Large River Floodplain Forest West Gulf Coastal Plain Near-Coast Large River Swamp West Gulf Coastal Plain Small Stream and River Forest West Gulf Coastal Plain Wet Longleaf Pine Savanna and Flatwoods

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
Riverine	Instream habitats of the watersheds which intersect this ecoregion Ecologically Significant Stream Segments - Sabine River, Neches River, North Fork Taylor Bayou, South Fork Taylor Bayou, Taylor Bayou, Willow Marsh Bayou, Big Hill Bayou, Salt Bayou, Keith Lake/Johnson Lake systems, Old River, Carpenters Bayou, Oyster Bayou, Armand Bayou, Clear Creek, Halls Bayou, Mill Creek, Brazos River, Big Creek, West Bernard Creek, San Bernard River, McNeal and Redfish Bayous, Jones Creek, Austin Bayou, Bastrop Bayou, Colorado River, Big Boggy Creek, Cedar Lake Creek, Guadalupe River, West Mustang Creek, Lavaca River, West Carancahua Creek, Tres Palacios, Garcitas Creek, Arenosa Creek, Nueces River, Aransas River, Mission River, Arroyo Colorado, Rio Grande/Rio Bravo	NA
Lacustrine *See also* Cultural Aquatic	Resacas, oxbow lakes	NA
Freshwater Wetland	Upper reaches of most coastal marshes/estuaries Upper: interdunal swale wetlands, other upland freshwater wetlands, forested wetlands, prairie potholes Mid: isolated wetlands, palustrine emergent wetlands: seasonal (ephemeral) and permanent Lower: springs, seeps, palustrine and freshwater wetlands, coastal potholes, blowout (wind	Southeastern Coastal Plain Interdunal Wetland Texas-Louisiana Coastal Prairie Pondshore

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
	depression) wetlands	
Saltwater Wetland	Upper: Chenier Plain Marshes (east of Galveston Bay), tidal fringe marshes; other marshes (sorted by salinity regime – saline, brackish, intermediate) Mid: Intertidal salt marsh: intermediate, brackish, and saline Lower: intermediate, brackish, inland high saline, Laguna high saline marshes; mangroves Spartina	Central and Upper Texas Coast Salt and Brackish Tidal Marsh Gulf Coast Chenier Plain Salt and Brackish Tidal Marsh Texas Saline Coastal Prairie
Estuary/Estuarine	Upper: natural Gulf passes (what's the "habitat" here?), deltas, oyster reefs Mid: open water beyond the marsh (such as?), oyster reefs Lower: oyster reefs, estuary (e.g. South Bay), hypersaline lagoon complex (e.g. Bahia Grande, Baffin Bay) Sea grass beds	Central and Upper Texas Coast Fresh and Oligohaline Tidal Marsh Gulf Coast Chenier Plain Fresh and Oligohaline Tidal Marsh
Coastal	shoreline (beach) natural shell and sandy islands	South Texas Salt and Brackish Tidal Flat Texas Coastal Bend Beach Upper Texas Coast Beach

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
	"barrier" islands spits, bars, shoals saline flats tidal mudflats wind tidal flats drift macroalgae and algal flats (different from mudflats)	
Marine (in-Gulf habitats)	Upper: Shallow subtidal open water, Hard-bottom Gulf, Clay banks, Artificial Reefs, Oyster Reefs, Submerged Aquatic Vegetation (includes seagrass beds), *Rangia* beds, submerged sands and soft bottom Mid: Seagrass meadows, oyster reef, serpulid reefs, submerged sands and soft bottom Lower: algal mats, oyster reefs, seagrasses, natural reefs (e.g.Seven-and-a-Half-Fathom, Flower Gardens) , submerged sands and soft bottom ALL: Gulf of Mexico mid and deep water habitats, reefs, marine canyons; see also artificial reefs	Texas Coastal Bend Seagrass Bed Upper Texas Coast Seagrass Bed Texas-Louisiana Fresh-Oligohaline Subtidal Aquatic Vegetation
Aquifer	Gulf Coast Aquifer	NA

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
CULTURAL TYPES	*habitats in this column must support SGCN or rare communities to be considered in this plan*	
Agricultural	Upper: flooded fields (e.g. rice), managed wetlands Mid: flooded fields (e.g. rice), other flooded agriculture (pecans? …) Corn, sorghum Field borders/corners managed in native prairie and/or native brushland, where connected to other viable prairie or brushlands	NA
Developed		NA
Urban/Suburban/Rural	Upper: managed urban forests Lower Rio Grande Valley: urban/suburban forest Cemeteries, especially older cemeteries which were hand-cleared and not planted with non-native grass (e.g. Bishop and Peñitas which harbor rare plants)	NA
Industrial	See Cultural Aquatic and Artificial Refugia	NA
Rights of Way	TL ROW, pipeline ROW, highway ROW (are these specific habitats for SGCN?)	NA
Cultural Aquatic	All subregions: jetties Upper: canal, irrigation ponds and ditches, stock ponds Mid: managed wetlands Lower: Brownsville ship channel (deep water refuge during cold weather events), irrigation canals and drainage ways, stock ponds, wastewater treatment ponds Reservoirs: B.A. Steinhagen, J.D. Murphree impoundments, Wallisville, Anahuac, Cedar Bayou Generation, Addicks, Barker, Sheldon, Lynchburg, Galveston County Water, Mustang, Smithers,	NA

GENERAL HABITAT TYPES	GULF COAST PRAIRIES AND MARSHES (GCPM)	GCPM Ecological Systems
	William Harris, Eagle Nest/Manor, Brazoria, San Bernard (1, 2, 3), Eagle, Texana, South Texas Project, Barney M. Davis, Loma Alta, Retama, Delat, Valley Acres	
ARTIFICIAL REFUGIA		
Mitigation and Placement from Channel Maintenance	Spoil Islands Placement Areas (PAs) Ocean Dredge Material Disposal Sites (ODMDS)	NA
Artificial Reefs	Decommissioned drilling rig placement to mimic natural mid and deepwater reefs (for a full accounting, see TPWD Artificial Reefs: http://www.tpwd.state.tx.us/publications/nonpwdpubs/media/2003_reef_map.pdf (this map is 2003, a more current version from 2006 may be available online soon)	NA

Texas shares its border with four states – New Mexico, Oklahoma, Arkansas, and Louisiana. GCPM crosses into Louisiana at the northern end of the region in Texas. Table 6 identifies habitat priorities which have been identified in the Louisiana Wildlife Action Plan which may be adjacent to the GCPM. 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 GCPM and are priorities for conservation in this ecoregion. See Statewide/Multi-region handbook for broadscale Conservation Actions for these priorities and those in the Gulf of Mexico.

Table 6. Shared Habitat Priorities with Adjacent State – Louisiana

Adjacent States	Ecoregions Shared with Texas	Habitat Priorities Shared with Texas[4]
Louisiana (LA)	Western Gulf Coastal Plain Gulf Coast Prairies and Marshes	bottomland forests coastal live oak-hackberry forest (chenier) cypress swamp seeps, bogs, other wetlands prairies, glades and barrens? coastal marshes upland coastal grasslands ephemeral and perennial tributaries and mainstem of the Sabine River, and associated riparian zones and floodplains TX – LA HUC 8 at high risk: Sabine Lake *Note: Marine and offshore Gulf of Mexico priorities were not included in the Louisiana plan online.*

[4] Priorities were determined by reviewing the state's Action Plan online (Louisiana Wildlife Action Plan. 2006. http://www.wlf.louisiana.gov/wildlife/wildlife-action-plan-details) and
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).

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 GCPM 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.

Special Note:

In this ecoregion, perhaps more than any other, the disruption of natural processes is fairly well-understood, critical to all SGCN and rare communities conservation, and tied to many other issues or impacts. In addition to coastal prairie and other priority terrestrial habitats, marsh and estuary health and function are one of the keystone elements for conservation in this plan (see also Statewide Handbook), dependent on freshwater inputs from the river systems that drain the lands of Texas to the Gulf of Mexico. Estuary vegetation, bottoms and shorelines are all affected by lack of instream flows, saltwater intrusion and tidal influence changes, erosion and human disturbances which contribute to these other factors through transportation and navigation projects and practices, non-jurisdictional wetlands vulnerability, upstream reservoir and dam operations, oil and gas development and delivery and stormwater runoff from upland activities. In the table below, many of these issues are discussed as are their impacts. Be mindful that many of these are all related to estuary health and need to be addressed in the actions section in a related way to be effective in changing the condition and sustainability of our important natural resources of this region.

Table 7. GCPM Priority Issues Affecting Conservation

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	Woody terrestrial (which can also invade low, wet areas): Chinese tallow, Chinese privet, Macartney rose, Japanese honeysuckle, chinaberry Nonnative and Old World introduced grasses: bufflegrass, oldworld bluestems, KR bluestem, tanglehead, guinea grass, lehmann's lovegrass Water-dependent, but not aquatic: arundo cane, deeprooted sedge, Brazilian pepper, salt cedar, Alligatorweed Aquatic: water hyacinth, salvinia, Eurasian water milfoil Other: kudzu	Urban and suburban areas and roadways throughout the region harbor numerous invasive species – Chinese tallow, kudzu, ligustrum, chinaberry, tree of heaven, nonnative grasses -- that are installed in residential and municipal landscapes, allowed to escape and spread into nearby wildlands and all points downstream (once in waterways, these infestations can spread as far as the floodwater will carry them within the water system and into adjacent areas). Once in wet areas, they are exponentially more difficult to eradicate or control. Non-native grass dominated areas have claimed millions of acres of native prairie throughout Texas and are a leading cause of steep population declines for wildlife dependent on native grasslands (e.g bobwhite quail, Attwaters Prairie Chicken, dickcissel, loggerhead shrike, scissor-tailed flycatcher, many types of pollinating insects, and the plants which in turn depend on these). From pollinators to birds of prey, all prairie dependent species experience population declines. Prairie birds that nest and forage on the ground do not have suitable nesting, travel lanes, thermal cover, foraging, brooding, loafing, screening, or escape cover within introduced grass areas. Invertebrate abundance, important for breeding bird fecundity, has been shown to be lower on introduced grass sites compared to native grass areas. Breeding birds have been shown to select native prairie sites more than introduced grass sites for nesting. The majority of non-native grasses for livestock forage are often managed as monocultures that resemble ecological deserts, not functioning ecosystems, and require annual fertilization to maintain productivity. Annual applications of fertilizer and herbicide become incorporated into rainwater runoff, leading to significant water quality issues. Properly managed native grasses do not require annual fertilization; highly palatable native grasses (i.e. Yellow Indiangrass, Little Bluestem, Big Bluestem, Switchgrass, and Eastern Gammagrass) provide high protein levels required for livestock and hay production. These factors make native grasses a sustainable option for Texas' rangeland and wildlife. In addition to terrestrial and aquatic wildlife benefits, pasture conversion back to native grasslands reap public benefits through improved water quality, groundwater recharge, carbon sequestration, erosion control, outdoor education, and recreational opportunities. Aquatics out competes native species by forming dense mats, lowering light penetration and dissolved oxygen levels. Impedes boat traffic on rivers and waterways and clogs irrigation canals and intake pumps
Non-native Animal	FERAL HOGS Feral cats Exotic hoofstock introduced for hunting caracara (TXHL) domestic waterfowl RIFA Raspberry crazy ants Grasscarp Lionfish Zebra mussels, bait fish releases, grasscarp	Feral hogs decimate important and fragile habitats (e.g. springs, seeps, riparian areas, wetlands), degrade instream water quality, change topography and runoff/collection patterns, and decrease hardwood seedling viability (rooted up, eaten) and vegetation community composition. Can be particularly detrimental to some prairie plants which are intolerant to soil disturbance. Hogs also decimate new restoration sites, making recovery expensive or even untenable. Free ranging pets (cats, dogs as individuals and as packs) are introduced predators which primarily adversely affect small mammals, small reptiles, and birds; in packs, can also adversely affect larger mammals and ground-nesting birds; also contribute pathogens and diseases. It is estimated that 60-100 million feral cats reside in the US and another 60 million pet cats are allowed to roam outside. "Neuter and release" programs only address fecundity in a limited way, and do not address the impact to natural resources. The number of birds predated by feral cats in the U.S. is annually is more than 1 **B**illion; numerous SGCN are affected. The IUCN ranks feral cats as one of the world's worst invasive species. (see The Wildlife Society, Wildlife Professional publication, 2011). Feral cats impact rookeries in this region Exotic antelope and goats introduced for hunting outcompete native herbivorous ungulates and small mammals for grazing and browse forage, and can compete directly with livestock production. They typically breed more often. They can also decimate hardwood regeneration, springs, upland grasslands (scraping), and other areas which are important for SGCN and rare communities. Caracara have continued to expand into Texas and effects are unknown, positive or negative. There is some documentation that they

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		may be predacious on Texas Horned Lizards, although it is not known if this is detrimental to TXHL populations or whether other factors in their decline are more important. RIFA are a predator to all ground-nesting and some shrub-nesting birds, small mammals, reptiles and amphibians; RIFA will invade and destroy/eat a nest of eggs and/or young, are extremely difficult to control in wildland and rangeland environments, and can overtake an area in a short period of time. Within streams, zebra mussels compete with native freshwater mussels, many of which are listed as state threatened. May also be gill parasites on certain fishes, unknown if they adversely affect any SGCN freshwater or bay/estuary fishes. Non-native baitfish and aquarium species releases compete with native fishes in many habitats and can be very detrimental if they are predacious. Exotic marine species in ballast water from increased traffic in ports Lionfish on the flower garderns have been shown to consume 70+% of annual recruitment of reef species including grouper; these and other invasive species direct compete with or alter the native habitat leading to threatened or endangered species.
Native Problematic	Mesquite, huisache, juniper, yaupon, whitebrush Brownheaded cowbirds *Editor's note: Cattle egret was proposed for this section; however, they do not appear to have a detrimental effect on SGCN through predation or competition*	Native brush invasion, where these species should not naturally occur or in abundances that are out of balance with the native communities, degrades grassland suitability and hardwood regeneration potential. Most of these "infestations" can be controlled by a restoration plan including prescribed fire or some kind of mechanical/chemical brush treatment, then a maintenance plan to mimic natural processes if the sites are large enough to function as a system on their own. In some instances, prairie restoration to control brush is more economical than non-native pasture conversion back to native grasses. Mesquite, huisache, and juniper invasion of prairies/grasslands throughout ecoregion, yaupon invasion in pine-oak woodlands, whitebrush invasion in woodlands and grasslands to the south BHCB have proliferated with increased habitat fragmentation and widespread farm and ranch use, congregating in livestock feeding areas. Brown-headed cowbirds are common during breeding bird surveys.
Introduced Genetic Material	Introduced genetic material causes loss of a species by hybridization	feral domestic mallards threat to mottled duck
Pests, Parasites, Pathogens		
Pests	cactus moth	
Pathogens	west nile virus, St. Louis, avian botullism, avian flu, cholera, duck plague, salmonella red tides, brown tides - not pathogen? Increase incidence of vibrio and water borne viruses (oysters) Red tide, brown tide, Harmful Algal Blooms Oak wilt, oak decline	Many of these diseases/pathogens are detrimental to the bird populations of the region, especially waterfowl Harmful algal blooms adversely impact seagrasses Vibrio and other waterborne viruses can adversey impact oyster reefs Oak pathogens are detrimental to important motte stopover habitats
Power Development and Transmission		
Wind Generation	Turbine siting and operations	See also full discussion in Statewide Handbook. While this region is not one of the identified Competitive Renewable Energy Zones designated by the Public Utilites Commission, the coast – offshore, nearshore, and terrestrial areas -- has very hig wind generation potential and current wind development activity. Tower siting in specific areas in addition to operations can be detrimental to migratory birds (hawks, neotropical migrants, shorebirds,

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		waterfowl), seagrasses and other substrates in which the footings may be placed (hard and soft bottom environments), bats and birds which can suffer barotrauma during operations, and the turbines can be a strike hazard for Whooping Cranes. Can also adversely affect shorebird overwintering (piping plover). As with the oil and gas industry, the dense network of maintenance roads/boating access for wind facilities poses a threat to small mammals and reptiles, fragments grassland and marsh habitats for all species dependent on these types, can provides avenues for greater predator access. Lack of reclamation with native seed or plant sources contributes to invasive species problems on terrestrial sites.
Solar or PV (photovoltaic)	Array siting and operations	Much of this area is flat, open, and has plenty of sun, making it a prime area for solar development. Site construction clears large areas of all vegetation, panels block sun and can change runoff patters which adversely affects vegetation recovery after construction, maintenance keeps site clear of brush and is not mowed in a sequence that would favor prairie restoration, reclamation is not required to native conditions or with native seed sources.
Coal fired Power Plants	14 proposed in Texas (how many in this region? Map? Citation?) Plant footprint, cooling pond and operations	Footprint of power plant and adjacent reservoir is direct loss of terrestrial habitat If the water cooling pond is dammed natural waterway, then contributes to loss of instream flows for aquatic SGCN, riparian communities, and estuary resources. If cooling pond is "created", water must still be drawn from existing water budgets which do not adequately account for fish and wildlife needs. Coal fired plants are also a source of evaporative loss from the water system – towers and open ponds Mercury releases (citation? How does this adversely affect which SGCN?) Emissions may contribute to climate change – see Climate Change below and in Statewide Handbook
Nuclear Power Plant	Expansion of the existing South Texas Nuclear Project	Manipulated landscape within the estuary system, changes in hydrography, potential releases
Hydro (Dam and Reservoir)		See *Water Development, Management and Distribution* below
Biofuels	Rowcrop, switchgrass, other herbaceous cover Algal farms	Loss of native prairie and rangelands which provide habitats for insects, grassland birds, small mammals, reptiles, and the animals, like shrikes and hawks, that feed on them Because these crops are not food sources, chemicals used for pest and weed control and fast growth fertilizers can be used; stormwater or irrigation runoff or overspray into adjacent wildlands from these applications are potentially hazardous to native habitats and in particular native insects.Biofuel production along the coast is done using non-native or GMO species. Of particular concern along the coast are algal farm discharges post-production. In addition to increase salinities and chemicals used during production, non-native alga could be introduced into sensitive systems and create another invasive species issue which would be VERY difficult to control or eradicate without great harm ot other species/systems. Non-native alga selected for biofuel production would have the characteristic to maximize growth , the same characteristic that would likely overwhelm native species.
Transmission	New development and expansion of existing corridors to serve the need of urban users (population growing), coastal developments, and new/expanded power plants	Broad, long, linear fragmentation of all habitat types. During route selection, environmental considerations are given secondary consideration to agricultural and developed areas. Contributes to edge through interior habitats (e.g. dense south Texas brushlands important for native cats) in the same way that oil/gas pipelines and road networks for wind generation sites, causing potential for greater predator and invasive species access. May hinder daily or seasonal movements and behavior for species which avoid open areas adjacent to remaining woodlands. While some of these facilities are compatible with grassland and prairie communities in this ecoregion (few species are known to have aversion to tall structures in this region, except Attwaters Prairie Chicken), these pathways are not required to reclaim or maintain cleared areas with native seed or plant sources. Transmission lines can be strike hazards for Whooping Cranes and raptors during

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		migration
Distribution		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) Migratory bird strikes are more prevalent with distribution facilities than transmission facilities; more careful site selection is important to avoid or minimize impacts when nearthe coast, along waterways, adajacent to wetlands and throughout the flyway.
Oil and Natural Gas Production and Delivery		
Seismic exploration	Network of cleared lines, explosive charges, no reclamation required	This is an ongoing issue. Most recently known is an operation proposed at the James Daughtry Wildlife Management Area and Choke Canyon State Park (which includes three management units, Calliham, South Shore, and North Shore, in Live Oak and McMullen Counties) Would encompass the entire reservoir, tributaries, and surrounding uplands; potentially restricting movements of species within the project area. Fish kills associated with seismic operations, which utilize high velocity source charges, have been well documented. Reasonably, other aquatic and water dependent species may also be affected – diving ducks, wading birds. Detonated charges which do not kill fish will cause undue stress, potentially increasing the risk of secondary bacterial or viral infections. Additionally, detonated charges my cause stressed fish to seek refuge and not feed, further reducing their viability. Seismic activities also impact foraging, nesting, spawning, rearing, and resting sites for aquatic and terrestrial species, and the impacted species may include rare, threatened, and endangered species In terrestrial sites, no reclamation with native seed or plant materials is required of the cleared lines to prevent oak wilt infestation or nonnative species invasion.
Extraction	Traditional extraction site development and operation, including pumping and pad sites, gathering stations, transmission/delivery facilities (distribution lines, roadway	Similar to electrical transmission lines, communications lines, and transportation corridors, oil and gas pipelines create edge through woodland and bottomland habitats, impact wetlands which are not jurisdictionally protecte, and in this region are a significant impact in marsh habitats – allows saltwater intrusion, creates open water areas, degrades shorelines, provides avenues for invasive plants, changes the water chemistry and quality in some areas. Little to no native reclamation is required. Oil, gas and other chemical storage in salt domes (Strategic Reserves) potentially may impact groundwater and surface water resources during transfer and delivery; could potentially impact areas over time if salt domes are not stable features (compromised by area subsidence, caused by sea level rise, oil and gas extraction, and groundwater extraction). Subsidence can also contribute to the loss of intertidal flats, wind flats Offshore drilling sites can contribute toxic materials to surrounding waters and substrates, may impact bottom habitats (see next)
Spill Response	Inadequate or Inappropriate response in terrestrial and aquatic environments	Because this area is heavily developed for oil and gas production and delivery, it has a concentration of facilities. The thresholds for reporting spills in any particular incident is insufficient to address the cumulative effect of many small spills in one region over time. Marine offshore operations may have inadequate response plans and mitigation requirements (e.g. Deepwater Horizon Spill, 2010)
Hydraulic fracturing ("fracking") or "shale gas" extraction	Is this an issue in this region? If so, be specific	

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Mining		
Sand and Gravel - upland and riverine	Disturbance of substrates in and adjacent to streams and within upland sites Loss of native grasslands and riparian areas Lack of reclamation to native conditions	Nueces, Colorado, Brazos, Trinity, San Jacinto and Guadalupe Rivers all have large sand/gravel operation and Nueces Adversely affects spawning and water quality at the site and downstream Promotes nonnative species invasion in terrestrial habitats
Oyster Shell	Net loss	Reef extraction during harvest is not replenished, typically the “waste” shells are dumped for terrestrial uses, rather than repatriated to oyster reef areas to provide habitat
Sand mining – coastal		Sand excavation on peninsulas Contributes to beach and shoreline erosion, loss; can contribute to saltwater intrusion in marsh systems depending on the area of take
Communications Infrastructure		
Cell and other communication towers	Tall structures within migratory pathways	Coastal areas are the “gateway” fro nearly all migrants through Texas; comm. Towers can cause strike hazards and disorientation
Transportation		
road and bridge construction (new)		This region has been identified in the National Highway System Congressional Priority Corridors documentation for improvement to exisiting and potneially new interstate level corridor development from the Rio Grande Valley and Laredo, on a trajectory near Corpus Christi and Houston (ports), northward to Arkansas and Louisiana to connect with other high priority corridors. While this corridor is no longer considered a Trans Texas facility, the I-69 corridor is planned to have interstate capacity. Texas Department of Transportation coordinates with TPWD regarding potential natural resources impacts to listed species; however, there is little accommodation for sensitive habitats unless those features are federally protected (federally listed species habitat, critical habitat, jurisdictional wetlands). State-listed species habitats, SGCN, rare communities and the habitats on which they rely are unprotected. The transportation improvements proposed under regional upgrades of existing facilities and new construction may create barriers to fish and wildlife resources’ daily and seasonal movements, vectors and opportunities for nonnative species invasions, water quality impacts through stormwater runoff, loss of nonjurisdictional wetlands, and important riparian, bottomland, prairie and savanna habitats that are not protected under regulation. In addition to these larger facilties, local connection transportation projects may also contribute to the same kinds of losses and may require even less coordination regarding environmental impacts from planning to implementation if no federal money is used.bridge construction Additional concern in this region is the Padre Island second access bridge to the south, which may change bay and estuary hydrology, degrade bottom and shoreline habitats, and adversely affect resident and migratory shorebirds (esp. piping plovers) Lack of reclamation to native seed or plant material along new construction right of way or revised existing right of way
right of way maintenance		mowing, trimming timing (season, frequency) inhibit natural regeneration of prairie plants and don’t provide key habitats (tall grass prairie structure, seedheads) at best times of year to accommodate prairie animal and insect needs Most roadside are reseeded after construction with nonnative species or plant materials and regular maintenance activities also provide additional ground disturbance favorable to invasives herbicide application

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		some rare plants are known only from sites in ROW; these are not always adequately protected as staff changes occur, management plans are filed away, information not passed through entire chain of command - needs better communication in some places
Navigation	Channel deepening, widening Maintenance dredging for waterway channels and port facilities Redevelopment and new ports and waterways	http://www.charts.noaa.gov/OnLineViewer/GulfCoastViewerTable.shtml The primary navigation waterway along the coast is the Gulf Intracoastal Waterway (GIWW); however, there are other channels off of the GIWW which tap into ports along the coast, Brownsville to Beaumont (and beyond! (need a full list of waterways and ports) Maintenance dredging to widen or deepen channels or to add capacity to port facilities and channels disturbs soft and hard bottom (benthic organism, reefs), contributes to saltwater intrusion, tidal water access changes, and vegetation loss through increased shipping traffic and wave action or direct removal of vegetation, and can contribute to shoreline erosion in other areas. The sideeffect may also include marsh and coastal habitat loss for bulkheading, jetties, cuts and passes (closures and openings) and other construction to shore up around ports. Nearly every waterway contributes some level of degradation to the shores and marshes most adjacent to it. These changes are not independent from instream flow recommendations – these need to be considered together as inputs from "both sides" of the estuary systems.
Border Security		
Roads, Levees	Network of roads and levees which are routinely dragged, driven, and monitored	Very little natural habitat remains in the Valley and along the Rio Grande/Rio Bravo corridor. Roads and levees are installed parallel and adjacent to the river corridor. These surface changes impede natural surface runoff, contribute to localized erosion issues, and degrade water quality. Roads are routinely dragged to be able to detect foot and other trespass traffic, creating soil disturbance and repeat vehicle traffic which contributes to road mortality of small reptiles, mammals, ground birds. Light is installed on these sites and disturbs natural daily and seasonal movements, foraging for some species.
Border Wall	Built environment – structure, monitoring stations, roads - adjacent to the river along certain segments of the border to prevent illegal traffic crossing	The Rio Grande is an important corridor and habitat connection between Mexico and Texas. We share management of the water quality and quantity and species do not abide the political boundary. Unlike in the Chihuahuan Desert ecoregion, collaboration on natural resources conservation has been less of a focus than collaboration on economic development and settlement. Built next to the Rio Grande, the wall removes important riparian and brush habitats for breeding birds and species which use these corridors for daily and seasonal movements, provides opportunities for invasive plant colonization (no reclaimation of cleared areas even to native grasses), impedes daily and seasonal movements for many species which are intolerant of travel in open areas … the wall itself is a barrier to species' movements on the ground and through vegetation.
Land & Water Mgmt: FARM	See also Water Development section	
Conversion	Loss of native prairie to agricultural row crop or "improved grass" pasture for livestock production	Native prairie is rare and occupies very little on the coastal landscape, where once it was a vast swath from the Sabine River to the Valley, incised by wooded bottomlands and ravines, the beginning of "terrestrial" habitats off coastal marshes, the buffer and contributor to coastal freshwater wetlands. Prairie (native grasslands) may be on of the most threatened habitat types in Texas. Conversion to rowcrop and turf grass agricultur in this region is prevalent. See also Statewide Handbook for this issue. Conversion is difficult to overcome, even with resources. Aside from the loss of native seed and plant sources, soil horizon disturbance creates unfavorable conditions for some species ever recovering. Chemicals may be latent. Brush and nonnative grass invasion is expensive to treat.
Lack of soil and water management and conservation practices		Agricultural field borders benefit agricultural practices in wind barriers and filtering field runoff; however, they are also very beneficial to SGCN and rare communities (perennial bunchgrasses, woodland and grassland birds, migratory birds, pollinators) by providing cover, seeds and insects Herbicide use reduces herbaceous resources necessary for breeding birds. Pesticides reduce high protein insect forage for grassland birds and affect all insects in the community, including pollinators. Not much is understood about the collapse of certain pollinators. Overspray

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		can decrease or completely wipe out native insect fauna, important pollinators in native grassland and prairie systems Haying practices are commonly detrimental to many SGCN and the rare prairie communities. In the short term, ground-nesting birds are directly impacted through nest destruction or removal of nesting cover during the breeding seasons. In the long term, the historical climax tallgrass community composed of the big 4 grasses is replaced by low quality habitat and forage. Haying generally starts in early spring to remove cool season grass production. This takes place before offspring are mobile and ground nesting birds have fledged young. Often, the structure necessary to nest is removed before migratory birds arrive or residents initiate nesting activities. Repeated haying takes place throughout the growing season on numerous properties, large and small. Undoubtedly, many pastures are hayed only to retain open space agriculture tax valuation. Haying mines fields of nutrients and often costs more than it yields. Also, repeated haying at the same time every year reduces little bluestem, switchgrass, big bluestem, indiangrass and eastern gamagrass that are required components of prairie wildlife habitat. Haying in the late summer and fall removes herbaceous structure for winter migrants. Thus, thermal and escape cover is unavailable for most overwintering species. That said, some winter migrants (plovers, hawks) find these cleared areas for resting favorable to invaded grasslands, woodlands or riparian areas; so, some may serve a purpose. Overall, however, the bottom line is that over utilization of herbaceous resources through mechanical cutting or non rotational, overstocked grazing has and continues to be a negative factor causing declines of SGCN. Insufficient stormwater controls between agricultural production and waterways (or dry drainages that lead to waterways during rain events) adverse lead to chemical impacts to sensitive aquatic insects, freshwater mussels, riparian invertebrates, freshwater fishes, amphibians, and eventually bay and estuary systems – invertebrates, fishes, and birds. Streamside Management Zones are important buffers between agricultural practices and aquatic impacts, and these riparian areas serve as important habitats in their own right for many forest and woodland dependent SGCN. Riparian and floodplains are frequently cleared for agricultural production because they are relatively flat, have access to water, and soils are productive.
Nutrient Loading	Fertilizers, CAFOs, other agricultural runoff without stormwater pollution prevention controls or plans	Nutrient loading and pollution in bays can shift the entire vegetation community, aquatic life community, water chemistry TMDL recommendations need to account for wildlife and fisheries needs
Impoundments	Small impoudnments on tributaries for private ponds	Similar to reservoir development on mainstem rivers, negative impacts caused by impoundments on creeks and springs are just at a smaller scale: loss of instream habitats, loss of wetlands, loss of riparian habitats and natural floodways. The replacement value – still deeper water for flowing waters, pond for stream – is not ecologically synonymous. This may be more of an issue in the emerging “urban/suburban” areas.
Economics	Use of Farm Bill and other incentive programs for conservation programs to compete with farm market.	Using Farm Bill programs can be one of the best tools to engage private landowners in longterm conservation practices; however, must be market-competitive and contract-savvy to be effective as a conservation tool.
Land & Water Mgmt: RANCH	See also Water Development section	
Incompatible stocking practices		Ranching – in some locales promotes conversion of native grassland to non-native sod-forming grasses (e.g. Bermuda), intensive grazing degrades native plant communities, feeding of livestock introduces exotics into native plant communities; ranching produces large numbers of cowbirds which are parasitic nesters to a number of SGCN birds. Ranching with associated livestock grazing can be beneficial to SGCN. Many variables effect the pros and cons of each ranching operation. Concentrated supplemental feeding of livestock herds attract large numbers of brown-headed cowbirds which are parasitic nesters to a number of SGCN birds. Livestock can be one of the best tools for wildlife management on native grasslands. Native prairie under long-term conservation easements often lacks the proper disturbance regimes necessary to produce suitable habitat conditions for resident and migratory wildlife. In the absence of grazing, habitat structure, namely bare ground, is largely unavailable on highly productive prairie soil types. Grazing increases bare ground foraging and traveling habitat. Also, sunlight reaching bare mineral soil will promote annual forb production released from perennial canopy cover competition. However, grazing can be a double-edge sword when managing for

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		wildlife. Many ranches with cattle operations are utilizing non rotational, year-round livestock grazing. Additionally, stocking rates are often above the carrying capacity of the land. Therefore, the most palatable grasses (i.e. Indiangrass, little bluestem, big bluestem) decrease and are replaced by increasers that do not provide equitable wildlife habitat. Tallgrass communities will transition to a midgrass-dominated community under the stresses of improper grazing management. The first species to decrease in dominance will be the most palatable and/or least grazing tolerant grasses and forbs (e.g. switchgrass, Indiangrass, big bluestem, and Engelmann's daisy). These species that decrease under this grazing regime provide required habitat for grassland wildlife. As improper grazing management continues, little bluestem will decrease and midgrasses such as silver bluestem and sideoats grama will increase in composition. Stocking rates are generally 3 times higher than what is recommended. Subsequently, herbaceous species composition, diversity and structure become inadequate for productive wildlife habitat. Tall bunchgrasses are eliminated under this scenario and this lack of suitable nesting cover is the one of the most ubiquitous limiting factors in grassland bird production across the coastal prairie. Rotational grazing systems are more sustainable for forage production and wildlife populations. Properly implemented rotational grazing creates structural and floral diversity relative to year round grazing and allows rangelands to rest, mimicking historical patterns of disturbance. The bottom line is that over utilization of herbaceous resources through mechanical cutting or non rotational, overstocked grazing has and continues to be a negative factor causing declines of SGCN.
Landowner/land management incentive programs working at cross-purposes	Deer breeding programs and herd augmentation Non-native seeding recommendations	Import and transfer of native species from other areas thorugh breeding programs to augment hunting incomes can be very detrimental to native wildlife, contributing to overstocking. Some agricultural improvement programs recommend nonnative seed and plant materials over native, less opportunity to manage for diversity
Fencing	High Game Fencing	High game fencing reduces genetic viability in all species inside the fence (depending on construction), fences in non-natives and can degrade natural habitats quickly without VERY intensive management to control hogs and other destructive non-natives, makes management of a public resource onerous on the landowner, requires intensive planning and is not suitable for most wildlife species or the longterm financial condition of most ranches
Clearing and loss of important natural sites/habitats	Impoundments on private lands Riparian and floodplain clearing	Impoundments: similar to reservoir development on mainstem rivers, negative impacts caused by impoundments on creeks and springs are just at a smaller scale: loss of instream habitats, loss of wetlands, loss of riparian habitats and natural floodways. The replacement value – still deeper water for flowing waters, pond for stream – is not ecologically synonymous. This may be more of an issue in the emerging "urban/suburban" areas. Riparian clearing for livestock access and floodwater conveyance/drainage
Subdivision of larger lands into smaller parcels ("ranchettes")	ownership fragmentation of large ranches – more fencelines, more infrastructure, different management practices and goals, harder to do outreach and influence management, fragmentation of land management practices; inheritance ("death") tax burden; absentee and unfamiliar land owners – changes in management intentions and goals	While not all land subdivision is necessarily a negative event for conservation, subdivision typically brings with it very diverse land ownership styles and objectives, increased potential for feral animal and escaped non-native landscaping, additional surface and groundwater demands on regional resources, and loss of habitat for homesite development and "ponds" Landowners bring their vision of manicured and "tamed" landscaping to suburban and rural areas, overcutting native prairie, removing brush and woodlands from drainages, clearing fencelines, and installing turf grasses. Typically, these sites also apply fertilizers and herbicides at unspecified rates, causing issues in riparian areas and aquatic habitats from runoff. Forage production is not a consideration in these locations. Most of these sites are too small to qualify for technical assistance or landowner incentives. Outreach, technical guidance and incentive programs have a more difficult time serving this constituency because the effort and resources required are multiplied, but no more service resources (people, time, money) are available. Additionally, it is difficult to provide conservation services that are of value to the ecological needs of the area with many fractured landscapes and objectives. Some tools (e.g. RX fire) and incentive programs are not available for use at smaller scales or cannot be effective to improve conservation values.
Fire suppression and lack of or inappropriate application	Prescribed fire adjacent to agricultural lands and urban areas	Appropriate fire application in appropriate habitats – grassland desired ecological condition vs. shrubland desired ecological condition

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of Rx fire	Lack of technical expertise and equipment	Native prairie plant and wildlife species are adapted to periodic fire disturbance and its effects are necessary to create the habitat requirements of many species. During a small window of time, prairies are often invaded by woody shrubs, leading to further changes in water infiltration, herbaceous cover, and erosion. Additionally, annual wildflower and grass species' production is often lost without disturbance due to dense, matted perennial herbaceous cover and ground litter. Furthermore, habitat suitability for many prairie-dependent wildlife species will significantly decline because they rely on disturbance to create their habitat requirements. Fire can increase plant diversity, create weedy areas for upland birds and ungulates, maintain wildlife cover requirements (i.e. nest, escape, brood, fawn, and thermal), produce nutritious regrowth for ungulates, enhance structural diversity, maintain or set back successional stages, increase forbs, alter insect type and abundance, prevent woody invasion, alter the distribution of ungulates, reduce the risk of wildfire, increase nutrient cycling and microbial activity, improve forage characteristics for grazers, browsers and foragers.The lack of fire and excessive grazing during drought has resulted in mesquite and juniper encroachment in many areas.
Land & Water Mgmt: Municipal		
Lack of Zoning and Planning		Metropolitan Planning Organizations, Councils of Government, Regional Transportation authorities, and other planning entities which encompass emerging and outlying communities rarely consider fish and wildlife resources, rare communities and habitats as part of their constraints process. Additionally, more of a burden is placed on county resources to deal with environmental issues outside of city jurisdictions in many of these areas; however counties rarely have such authority to require stormwater pollution prevention, flood control projects, appropriate road development, conservation of nonjurisdictional wetlands, open space planning, or water or other conservation measures from developers. And, even those authorities which have this ability rarely use it during planning processes to set aside, plan around, or plan to mitigate for areas important to fish and wildlife resources – floodplains and riparian areas (intact and those with restoration potential), prairies and other grasslands, wetlands of all kinds. Urban sprawl, bedroom communities, suburban commuter communities all continue to contribute to prairie loss, woodland clearing, filling non-jurisdictional wetlands, and degradation of instream and stream-adjacent habitats from water qualityand quantity impacts. This is not just an issue for fish and wildlife resources, but also for prime farmland and ranchland in these areas. From 1982 to 1997, the conversion of rural land to urban use in Texas was reported to exceed 2.6 million acres. Prior to urban development, these lands had wildlife habitat management and restoration potential. Zoning current agricultural or ranching lands for future commercial or municipal use removes the opportunity to restore these lands to functional habitats and contributes to their disconnection/fragmentation. In coastal areas, lack of zoning and planning has contributed to residential and commercial development without setbacks fromimportant natural areas, shorelines (contributes to erosion), and dunes. Also development in marshlands and shallow open water environments encourages bulk-heading and channelization for marinas, and loss of natural system function (tidal influence, bottom habitat loss, vegetation loss). In this region in particular, development in floodplains is not well-regulated. floodway management and floodwater conveyance has removed significant areas of bottomland hardwoods, marsh and other riparian zones to favor armored (concreted or gabioned) "creeks" without adequate stormwater pollution prevention. These waters sourced from urban and urban-adjacent agricultural areas as runoff during storm events travels quickly toward the coast and does not have the benefit of filtering through riparian, bottomland and marsh environments before dumping sedimenent and chemical loads in the estuary.
Land & Water Mgmt: Conservation & Recreation		

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
Inadequate/Inappropriate Management		Lack of regionally specific native plant materials and seed sources; nonnatives or native but not regionally native used in restoration Riparian clearing for river access and floodwater conveyance Lack of reclamation after construction projects Trail placement and revegetation through sensistive features and/or not revegetated adjacent to new facilties with native seeds or plant materials.
Inappropriate Recreational Uses		ORV use in sensitive areas: stream and dry stream beds, beach Boating in sensitive areas: seagrass prop scars Water quality degradation, instream habitat loss (substrates disrupted or lost), riparian loss, slope vegetation loss or impact, human disturbance in nesting or roosting areas Whle most public lands in this region are managed for recreation compatible with wildlife and fisheries resources, some improvements could be made to trails and recreation facilities to prevent soil erosion and water quality impacts, vegetation loss (especially near water resources), reduce human disturbance in roosting or breeding areas
Urban parkland management		Greenspaces (parklands, preserves, open space, vacant areas) within an urban context may have potential to function as stepping stones (woodland mottes) or pathways (riparian areas) during migration; additionally, some of the larger spaces could function as connections between/among natural landscapes outside of the city limits, demonstration areas to connect urban populations with natural area conservation concepts (what prairie is, how we impact it, how it serves that particular population with ecological services, particular regional conservation actions that would benefit specific habitat, species, communities).
Lack of connectivity between public lands managed for conservation		While fee-title or easement protections “fenceline to fenceline” are not necessarily needed in this region, largescale conservation benefits could be realized by mapping existing conservation lands and practices, reviewing opportunities to share resources and improve land management through shared guidance, and identifying landowners and sites which could benefit landscape and conservation management connectivity in the long term through landowner incentive programs – riparian, prairie.
Water Development, Management and Distribution	SEE ALSO STATEWIDE HANDBOOK	
Surface Water Planning		This ecoregion intersects several of the most populous metropolitan areas in Texas: Houston, Corpus Christi, and the Valley plus their emerging communities adjacent to these urban centers. Urban/suburban impacts to conservation activities and natural resources even outside of these “boundaries” is particularly relevant. There are several issues, one of which is surface water demand, use, development and distribution – all addressed through various water planning processes. **Natural resource professionals, both terrestrial and aquatic, need to be consistently involved in RWP processes** Instream flow recommendations need to be stepped out from headwaters to estuaries to influence regional water planning processes; this is especially important to consider in conjunction with saltwater intrusion and marsh loss Overallocation/dewatering and damming of region's principle rivers; Central TX, Mexico, and New Mexico control the downstream flows, lack of flooding and instream flows, upstream flow regulation Water is the most critical item for bays, estuaries, marshes and marine environments. Estuaries are defined as a salt and freshwater interface which provides a myriad of nutrition and sediment loading issues which support estuarine life. About 95% of all oceanic species utilize the estuaries for some or all of their life stage. As water is removed from the stuaries, the composition of species may change, microhabitats that support rare species will be altered and fringing plant communities changed. Loss or alteration of species will result in

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
		direct species changes and likely indirect changes as spawning times and location and even species are altered and migrating birds are unable to find enough forage to sustain migration. Examples are the whooping crane which may not have enough forage to sustain migration and long lived gar may not be able to find the narrow range they need to spawn See also the WATER sections in this document and in the Statewide handbook
Reservoir Construction and Operation	new inland reservoirs proposed	Every upstream reservoir from this area, along major and minor waterways, has the potential to affect the health of wetlands, marshes, estuaries and eventully the Gulf of Mexico. Reservoir operation reviews are needed to identify where environmental flow regulations could maintain natural pulses and minimize impacts during droughts 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. Development associated with reservoirs can also be detrimental to water quality, riparian habitat, shoreline and wetland habitats: Levees, bank armoring, culverts all remove instream and stream adjacent habitats, contribute to unnatural sediment and nutrient loading downstream and to estuaries Overallocation of water within the systems contributes to varying reservoir operations and needs. Need to redo water release model created for lakes Corpus Christi and Choke Canyon - current model only considers salinity and six saltwater species. Sediment management: dams restrict sediment flow in rivers, net negative sediment balance can adversely affect estuary nutrients See also Statewide Handbook for this issue
Groundwater Planning and Distribution		This ecoregion intersects several of the most populous metropolitan areas in Texas – Houston, Corpus Christi, and the Rio Grande Valley, along with the emerging development communities that surround these urban centers. Urban/suburban impacts to conservation activities and natural resources even outside of these “boundaries” is particularly relevant. There are several issues, one of which is groundwater demand, use, development and distribution – all addressed through various water planning processes. Aquifers continue to drop and several segments are unmanaged. Groundwater conservation districts would allow management for conservation, preservation, recharging, and prevention of waste of groundwater resources. SGCN and rare communities needs are not addressed in most groundwater management planning efforts. SEE STATEWIDE HANDBOOK FOR MORE DISCUSSION/ACTIONS. Subirrigated, instream and stream-adajcent and isolated habitats which rely on groundwater are adversely affected by dry conditions, some of which are permanently impacted after drought periods; overpumping lowers water table, contributes to regional subsidence, may allow saltwater intrusion into aquifers and surface water features, and changes instream and wetland conditions such as temperature, oxygen availability, and other nutrient and chemical factors on which aquatic life relies
Other Water Source Developments and Technologies	Interbasin Transfers Water Conservation Measures Desalination	Regional metropolitan areas and their outlying emerging communities continue to seek water resources outside of their basins: reservoir development, interbasin transfers, groundwater development and pipelines. Water costs are related to what ratepayers will pay and not related to the water development impacts – mitigation for resource loss under reservoirs, to groundwater, and to estuaries, is insufficient and rates do not replace ecological values. Interbasin transfers can contribute different water chemistry and potentially invasive aquatic species to the receiving basin, while depleting water in the source basin. Water budgeting and allocation is already challenging without creating demand and future expectation in external basins. Urban areas rarely have landdaaping or water restricting guidelines/rules that account for all water uses. Rates are typically not indicative of real water costs for development and mitigation/loss of natural resources. Water usage rates should have incremental cost increases

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
		to curb waste of water resources. Desalination is an emerging technology with few regulatory controls; concerns arise out of the hypersaline waste discharge and its effects on the receiving waters.
Water Treatment and Discharge		Throughout the region, waterways and estuaries are the “end of the line” – all water use and wastewater practices eventually end up in this region, from untreated waste in the Rio Grande/Rio Bravo system to water that has been used and reused from headwater to Gulf, not always with compelte toxin removal (e.g. endocrine disrupters, prescription medications). There is little known with certainty about the effects of these end of the line discharges to our invertebrate estuarine communities and the speces which rely on them for food, influences on harmful algal blooms, or reproduction disruption in for rare and important species. TMDL recommendations are very important in this regard for human consumption; however these recommendations rarey address fish and wildlife resource needs for water quality.
Lack of Information & Resources	One response stated this is an issue, but did not provide additional information	
System specific needs		impacts of reduced freshwater inflows on blue crab population dynamics; understanding hydrologic connectivity among coastal freshwater weltand impacts of non-native species on wetland function and subsequently on adjacent habitats regionally specific best management practices for riparian, brush management, prairie restoration, particular bay system marsh restoration
Species-specific	Species and rare communities information is key to be able 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. If we don’t know where important priorities lie, we cannot effectively use the resources we have to reverse downward trends, recover and delist species, and ensure that we are making conservation progress.	SGCN that are not listed have very litte linformation in any of the databases used to make conservation planning decisions, landowner incentive offerings, or restoration priority setting Whooping Cranes: instream flows, drought, limited habitat availability for expansion/recovery, sea level rise
Targeted outreach	Urban Audiences Recreational Users in Bay Systems	Urban audiences who can make a difference in the effectiveness of conservation in this region need specific programs about the value and natural heritage of native prairies and grasslands, drainages and floodplains, aquifers and surface water quality and quantity, stormwater pollution prevention, and impacts outside of this region’s water planning efforts on other areas Bay boaters and other recreational users need targeted outreach to address seagrass conservation, avoidance of rookeries and nesting islands
Inadequate Policies, Rules, Enforcement		

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
Non-jurisdictional Wetlands		Loss of and impact to "non-jurisdictional" wetlands and other waters, Replace “out of kind” with less valuable or less functioning habitat, Lack of enforcement to ensure required mitigation is successfully completed and mitigation sites are not reused years later. After the fact permitting should be discouraged consistently. Cumulative impacts for multiple development projects impacts to habitat and species are not considered. generic language within Clean Water Act Section 404 does not adequately protect coastal freshwater wetlands; Loss of coastal freshwater wetlands – development, loss of isolated wetlands (excavation and fill), regulatory authority loss private lake/stock pond construction, control structures, fill and conversion for agriculture and other development, mining: bogs, seeps, marshes, forested wetlands, and other intermittent and perennial waterways affected;
Commercial Fishing		Trawl by-catch (e.g. Atlantic croaker, southern flounder, blue crab)
Recreation		Seagrass Damage Disturbance to nesting islands – proximity Mudflat and shoreline nesting area protection Dumping on the Water
Lack of enforcement capacity	Sale of prohibited nonnative species – collected or imported lack of enforcement for prohibited chemicals Illegal dumping Unclear rules or limitations about disturbance Overfishing – commercial and recreational	Which species in this ecoregion? illegal trade and commercialization, poaching (turtles, plants esp cacti, …) Which chemicals in this ecoregion? unregulated collection – cactus, turtles, snakes, digging up other veg – commercial trade, personal collections, food sources
Insufficient Mitigation		wetlands, uplands – does not always match up to the loss in function and location; mitigation banking issue could become big in this area (mitigation concentration in one area, but widespread impacts) Piecemeal mitigation and mitigation after devlepment has made impacts is ineffectual for ecological restitution. It would be helpful to have large areas identified where mitigation dollars would best be spent to offset particular types of impacts in the region: wetlands, water diversions, prairie loss, riparian loss. A network of potential areas in a north-south trajectory in the region may be most helpful to create “stepping stone” prairie connectivity, but sites should be large enough to function sustainably. Mitigation banking could be another type of landowner incentive.
Other Cross-Cutting Issues	See Statewide Handbook for more discussion and actions	
Conservation Funding	Conservation funding is insufficient to keep pace with impacts, prevent listings	See Statewide Handbook
Climate Change	See also CLIMATE CHANGE in Statewide handbook	Climate change is most evident in coastal areas; barrier islands, shorelines, spoil islands all are immediately subject to visible effects; less visible but equally important are the changes in water chemistry and quality in our bays and estuaries due to relative sea level rise, subsidence. Ocean acidification may be an adverse effect on our natural and artificial reef systems. Sea level rise may flood piping plover or other waterbird critical habitat; changes in weather patterns may adversely affect species etih certain thresholds for water temperature or salinity (inverts, white faced ibis young)

General Issue	Ecoregion Issue Identified in Workshops (2010) and Surveys (2011)	Description of Adverse Effects Identified in Workshops (2010) and Surveys (2011)
Demographic Shifts	Urban Non-English Speaking Unfamiliar with Desired Ecological Condition on any particular site	Ethnically specific outreach – need diversity that reflects the general population
Economics	Inheritance taxes Competitive Incentives mineral development – higher income than ag, ranching or hunting incomes	See Statewide Handbook for more discussion on this issue Landowner incentives cannotcompete currently with market forces; market forces in some areas do not support large acreage ownership without intensive use Reduction of rice acreage (ag) threat to some of the species on the list

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*.[5]

Actions proposed for the GCPM Ecoregion (Table __) 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.

[5] 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 8. GCPM 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 **Editor's Note: There may be many of these actions which appear to duplicate recommendations. This draft is an opportunity to review those actions and hone them into regionally cohesive actions.**	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
Surface water management is a key issue in this ecoregion, which covers many municipalities and watersheds and directly impacting estuary and Gulf of Mexico health. Identify a coalition or natural resources advisory group of terrestrial and aquatic ecologists across natural resources management entities for the ecoregion by basin. Craft SPECIFIC recommendations based on available science and regionally specific information about terrestrial and aquatic concerns, instream flow needs for fish and wildlife (including estuary health), sensitive and unique areas to avoid reservoir development, opportunities for water quality improvement (TMDL) to conserve SGCN and rare communities and priority habitats related to surface water management. Support the conversion or transfer of existing unused water rights to the Texas Water Trust to protect instream uses. Develop a means to aid in funding the transfer of unused water rights to TWT. Study current water use and rates paid in large urban areas, versus the cost of longterm ecological loss from reservoirs or other water development projects. Convey the findings to regional surface water planning groups and make recommendations for changes to accommodate realistic mitigation. Additional recommendations for accurate and complete water accounting would be useful for all planning processes. Given small budgets for time and travel, elect a spokesperson (or rotating spokesperson) to attend and participate in Regional Surface Water Planning meetings and convey the group's recommendations.											
Groundwater management is a key issue in this ecoregion, which covers many municipalities and watersheds, related to surface waters which contribute to our coastal estuaries. Support the establishment of groundwater conservation district(s) that align most closely with the aquifer boundaries and use areas in and out of these basins to support management for conservation, preservation, recharging, and prevention of waste of groundwater resources. Identify a coalition or natural resources advisory group of terrestrial and aquatic ecologists across natural resources management entities for the ecoregion by aquifer. Craft SPECIFIC recommendations based on available science and regionally specific information about terrestrial and aquatic concerns, groundwater-surface water connection for instream flow needs for fish and wildlife (including estuarine health), sensitive and unique areas which may be adversely affected by groundwater withdrawals to conserve SGCN and rare communities and priority habitats related to groundwater management. Additional recommendations for accurate and complete water accounting would be useful for all planning processes. Given small budgets for time and travel, elect a spokesperson (or rotating spokesperson) to attend and participate in Regional Surface Water Planning meetings and convey the group's recommendations. Evaluate the effectiveness of this activity and share lessons learned in other regions which could benefit from this experience..											
Work with Texas land trusts and other public and private lands partners to identify coastal prairie priority conservation areas for long-term rotating and/or perpetual conservation that have high native prairie species diversity, documented SGCN and/or rare community occurrences, are large blocks which could be networked for system function, could serve as a seed source for local restoration projects, are adjacent to existing managed conservation lands. Restoration sites on agricultural lands need to be identified and networked to existing conservation lands to enhance the sustainability of the restoration and the resiliency of the intact prairies. Given the regional growth and pace of development, conservation easements, Purchase of Development Rights, or other conservation instruments need to be high priority High priority bird species conservation goals using Gulf Coast BCR/Gulf Coast Joint Venture could provide the											

Conservation Action **Editor's Note: There may be many of these actions which appear to duplicate recommendations. This draft is an opportunity to review those actions and hone them into regionally cohesive actions.**	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
best first estimate for a conservation acreage target starting point in coastal prairie, freshwater wetland, and estuaries for the next ten years (or other time interval?) Another criteria may be for geographical locations within 1 hour of urban areas so they could serve as locations for education, outreach or demonstration. See urban recommendations.											
Conservation practice providers need to identify a suite of native plant species for each priority habitat type which can be promoted with one voice to plant materials centers and commercial distributors. Engage Master Naturalists, Native Plants Society of Texas, Native Prairies Association, land trust and NGO volunteers in coordinated/targeted seed and material collection. Assess success of these programs and the use and success of the materials over time to determine if this is an effective approach or whether on-site or nearby collection on a project-by-project basis is more effective (conservation and costs).											
Conservation assistance programs (Farm Bill Conservation Title, USFWS Partners Program, Grazing Lands Conservation Initiative, TPWD Landowner Incentive Program) to private landowners are one of our best tools to engage working lands, active stewardship, and best practices for SGCN and rare communities improvement and resiliency. Some criteria and/or targeted actions are recommended in this region: ▪ Improve row crop agricultural field borders and farming practices to benefit grassland wildlife, soil and water resourdes – retain perennial bunchgrasses, forbs and woody fencerows; ▪ reduce "clean farming" and "clean pasture" practices with alternative management to benefit migratory birds and pollinators, retain fallow areas, islands and edges of native vegetation; ▪ encourage (or require if receiving state or federal funds) streamside management zones ▪ where adajacent to natural areas or native prairie, provide technical guidance on less toxic methods to control pests, weeds ▪ incorporate SGCN fish and wildlife habitat values and recommendations in rotational grazing system recommendations (Grazing Lands Conservation Initiative) See recommendation about market analysis											
Form multi-partner working group(s) to establish scientifically sound best management practices for **prescribed fire application** for the ecoregion (timing/season, period/duration, intensity, parameters for RX) for the restoration of prairie grasslands and avoidance of south Texas brush where brush is the desired ecological condition. Work with Rx fire technical experts and SGCN/rare communities experts to identify concerns, barriers, and solutions. Explore the barriers to applying this tool on private lands and make recommendations to overcome these barriers (policy? Targeted outreach? Technical workshops? Where are the most important areas, audiences?). Review existing successful practices and identify case studies for longterm monitoring. Landowners enrolled in programs such as CRP, PUB, EQIP or WHIP that have native prairie habitats would be prime candidates for prescribed burn management. The FWS, NBCI, NRCS, NPAT, TPWD, NWTF, TFS, TNC, and Gulf Coast Joint Venture (and adjacent Oaks & Prairies Joint Venture) are organizations tackling this issue within parts of the state. Identify <u>key</u> SGCN from a variety of taxa and rare communities in the recommendations for monitoring to determine effectiveness of the applied practices. Identify the data repository for this monitoring information so that practitioners can share lessons learned. *See note at end of table about conservation effectiveness tracking.*											

Conservation Action **Editor's Note: There may be many of these actions which appear to duplicate recommendations. This draft is an opportunity to review those actions and hone them into regionally cohesive actions.**	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
Form multi-partner working group(s) to establish scientifically sound best management practices for **chemical/mechanical brush control** for the ecoregion and *specific watersheds*. These practices will vary from the north end of the ecoregion's coastal prairies to the south end of the ecoregion's brushlands and prairie mosaic. Work with brush control technical experts and SGCN/rare communities experts to identify concerns, barriers, and solutions. Identify key SGCN from a variety of taxa and rare communities to monitor to determine effectiveness of the applied practices. Identify the data repository for this monitoring information so that practitioners can share lessons learned. *See note at end of table about conservation effectiveness tracking.*											
Form multi-partner working group(s) to establish scientifically sound best management practices for **riparian restoration by watershed** (e.g. riparian vegetation for the Rio Grande very different than that for the Brazos), 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). Work with riparian restoration technical experts and SGCN/rare communities experts to identify concerns, barriers, and solutions. Identify key SGCN from a variety of taxa and rare communities to monitor to determine effectiveness of the applied practices. Identify the data repository for this monitoring information so that practitioners can share lessons learned. *See note at end of table about conservation effectiveness tracking.*											
Form multi-partner working group(s) to establish scientifically sound best management and restoration practices for **transmission lines, roadways, pipelines adjacent to and through sensitive marsh and estuary areas**, including timing, direction of linear features, reasonable recommendations for restoration 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). Work with pipeline developer technical experts and SGCN/rare communities experts to identify concerns, barriers, and solutions. Identify key SGCN from a variety of taxa and rare communities to monitor to determine effectiveness of the applied practices. Identify the data repository for this monitoring information so that practitioners can share lessons learned. *See note at end of table about conservation effectiveness tracking.*											
Work with the Native Prairies Association's ongoing current effort to identify scientifically sound best management practices for **different types of prairie restoration**, 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). Work with prairie restoration technical experts and SGCN/rare communities experts to identify concerns, barriers, and solutions. Identify key SGCN from a variety of taxa and rare communities to monitor to determine effectiveness of the applied practices. Identify the data repository for this monitoring information so that practitioners can share lessons learned. *See note at end of table about conservation effectiveness tracking.*											
Create a multi-disciplinary ecology committee to identify three to five years of highest priority **research projects** (actual projects, not just concepts) 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. Identify the data repository for results so that practice can be shared and lessons learned. *See note at end of table about conservation effectiveness tracking.*											

Conservation Action **Editor's Note: There may be many of these actions which appear to duplicate recommendations. This draft is an opportunity to review those actions and hone them into regionally cohesive actions.**	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
Regional invasive species mapping and control approach(see Statewide Handbook for recommendations too): ▪ Involve regional land trusts, Master Naturalists, NGO volunteers and other professionals to participate in the TexasInvasives.org mapping program. ▪ Idenfity the hotspots for strategic targeted control and for reducing reintroduction. ▪ Research biological controls for Chinese tallow ▪											
Technical Guidance and Documentation FOR/WITH Conservation Service Providers (Audubon, NRCS, TPWD, TNC, NPAT, NPSOT, FWS, NWTF, GCJV and NBCI) specific to the issues and resources of this region: ▪ Land conservation tools: conservation easements, fee title, donations, mitigation banking, Safe Harbor, Candidate Conservation Agreements, Candidate Conservation Agreements with Assurances, stewardship/management incentive programs; include how priorities for action are determined, which are most successful and why, best practices – timelines, documentation, monitoring; lessons learned; and how to measure effectiveness of the tool used. ▪ Wildlife Tax Valuation – benefits, best practices to benefit SGCN and priority habitats; barriers to implementation and lessons learned to overcome barriers; monitoring recommendations ▪ Landowner Education: how to deliver the best message, what kinds of tools and support landowners expect, how to select and target your audience, levels of response based on type of outreach, how to measure effectiveness and application of the training, costs-benefit analysis, lessons learned. ▪ Prescribed Fire: technical training requirements, time, and costs for an effective program; how to develop a program and what partner resources are available; how to engage private landowners in Rx fire application; how to best deal with urban – wildland interface issues (what stakeholders need to be involved); how to generate interest in burn cooperatives to enhance the scale of fire application; lessons learned over time in this region; how to measure effectiveness of Rx Fire application (site specific and programmatically). ▪ Brush Management: where appropriate/inappropriate, current state of the science and practice, best tools for certain soils/substrates and brush species, how to develop a program and roll it out to private landowners, potential partners; lessons learned over time in this region; how to measure effectiveness of brush treatment application (site specific and programmatically). ▪ Same kinds of training programs for prairie restoration and riparian restoration. See Best Management Practice development recommendation above. Identify a host website to share ecoregional practitioner (not novice, not landowner, but professional) cross-training opportunities and documentation for RX fire, stream rehabilitation, reintroductions, brush management, GIS and corridor identification, other …											
Establish a regional *public lands* management cooperative to evaluate conservation effectiveness on sites and the connectivity of the landscape, identify restoration needs and sites, invasive species removal priorities, trail development and recreation planning improvement, and management practice improvement opportunities. Work together to pursue restoration funding and volunteers to share (e.g. burn teams, burn trailers/equipment, trail teams, riparian restoration teams, go in together on equipment and/or plant materials, schedule) among priority projects to benefit SGCN and rare communities, improve water quality, and provide demonstration areas for public and private landowner outreach. *See also public lands management recommendations in the Statewide Handbook.*											
Landowner Incentive and Education Priorities: ▪ Identify key areas for the restoration and protection of coastal prairie, riparian buffers and streamside management zones, thornscrub corridors, freshwater wetlands and marsh restoration, and connectivity in a network of managed lands (public and private) throughout the region (these											

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are areas for your target audiences) ▪ Conservation easements – specify management (prescribed burn intervals, rotational grazing, patch burn grazing, field borders, streamside management zone protection, or share cropping), development levels and protections, and monitoring targets/frequency/reporting ▪ Prescribed fire or brush management – large sites or cooperatives with willingness to commit to appropriate term management ▪ Management Plans – in addition to landowner objectives, review opportunities for SGCN and rare community habitat conservation; data collection; and monitoring (see effectiveness comments) ▪ Riparian Conservation and Restoration – Ecologically Significant Stream Segments to their headwaters, streams and rivers with groundwater interconnectivity, undammed stretches with direct contribution to estuaries ▪ Other 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 ▪ Urban/suburban landowners – specific programs which can connect urban users of resources to native wildland resource conservation efforts outside of urban areas to maximize conservation benefits; if in schools, create curricula for instructors to deliver. 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.										
Many SGCN in this region lack distribution and POPULATION status information; 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: Alligator Gar distribution and conservation requirements Collaborate with Louisiana and Mexico conservation programs, the Gulf Coast Landscape Conservation Cooperative, and the Gulf Coast JV to prioritize species (not just birds, but representative keystone species by priority habitat type across taxa) monitoring needs and implement a longterm monitoring program with centralized data collection and/or data sharing agreements. *Need to list any other species-specific needs.*											
Climate Change Climate change models and effects on shorelines, marshes/estuaries, isolated habitats, riparian areas, and springs/groundwater resources Form a working group with adjacent Texas Blackland Prairie, South Texas Plains, and Western Gulf Coastal Plains aquatic and terrestrial ecologists to identify river rehabilitation goals in/adjacent to undammed stretches below last impoundment to the estuaries to evaluate/implement instream flow recommendations; improve the quality, timing, and seasonality of releases, improve riparian restoration, and increase connectivity to improve resilience to climate											
Determine market values that are driving agricultural conversion (biofuels? crop prices?), livestock production, hunting and other recreation, and land subdivision 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.											

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Work with private landowners and conservation partners to minimize feral hog populations through hunting and trapping (aerial shooting is not a good technique in this area given the amount of closed canopy). Provide technical guidance and educational programs about the impact and management of feral hogs to benefit ground nesting birds, small mammals, aquatic species. Evaluate technical guidance programs with effectiveness measures.											
Map areas of high migratory bird diversity, stopover and overwintering use areas, rookeries, and …. including times of year, to share with TPWD Environmental Review staff that they can use to guide voluntary compliance in wind development projects and minimization/avoidance in regulated projects.											
Identify monitoring protocols (see effectiveness measures) for voluntary avoidance of rookeries, barrier and spoil islands, and other colonial waterbird sites to determine if signage, law enforcement presence or other deterrents are effective to protect these sites. Make recommendations to share ith other conservation practice providers based on these findings.											
Identify areas which would be best for beneficial spoil use to support SGCN. Share these site recommendations with TPWD Environmental Review, Texas Department of Transportation, US Army Corps of Engineers, Drainage and Navigation Districts.											
Identify specific areas for TXDOT Districts, navigation channel and port authorities, county road managers, power delivery providers, and oil/gas pipeline managers to improve right-of way (ROW) restoration and management: ▪ After construction, restore sites with native seed sources and materials ▪ Remove invasive species and restore prairie on existing ROW ▪ Terms of ROW easement need to include native prairie restoration and management (landownwer cannot convert these areas to nonnative grasses for grazing), riparian protection and wetland protection ▪ On roadways, enforce public right of way (prevention of private maintenance, overmowing, clearing) ▪ When mowing along roadways, mow approximately 15 feet from the shoulder within undeveloped areas ▪ In areas beyond 15 feet and on ROW through rural lands (Tlines, distribution lines, pipelines), do not mow between April and October in order to allow ground nesting birds to produce and native prairie plants to seed out.; mow on a 4-year cycle at an 8-inch height (if roadway, both sides of the road are not mowed in the same year, saves significant dollars for mowing costs and reduces accidents). ▪ Provide interpretive signage re these practices and outreach to neighboring properties so this can serve as a demonstration. ▪ Identify monitoring sites which can serve as mitigation as long as information is shared through a public database and conservation practice networks											

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Conservation service providers and ecologists need to engage with urban biologists to convey conservation needs and priorities to urban planning efforts through Metropolitan Planning Organizations, Councils of Government, Regional Transportation Authorities, Parks Boards, Counties, and others in current and emerging urban areas. Every conservation organization cannot attend every meeting (see the recommendations above about surface and groundwater advisory roles). Key issues may be: ▪ Shoreline protection and development setbacks ▪ Park and open space planning for habitat connectivity (daily and seasonal movements), riparian and streamside protection, water quality protection, *floodplain set asides and natural floodwater conveyances*, mitigation banks for in-jurisidiction projects ▪ Water quality protection through stormwater pollution prevention plans and facilities even where not required by regulation, leaving natural floodways intact rather than armoring ▪ Prairie conservation and mowing practices ▪ Water conservation practices ▪ Invasive species prevention and removal in public land, rights of way, planned developments (e.g. encourage native plant use in new housing areas, incentives for landscape conversion to natives especially in areas near waterways) ▪ Collaboration with counties for environmental protections (stormwater, invasive species, reclamation, dumping, other?) ▪ Tax incentives or disincentives for open land conversion, restoration, conservation planning Identify sources of volunteers and/or funding which could help municipalities employ conservation practices. As with any outreach program, these efforts need to have reporting objectives and monitoring of sorts to determine effectiveness, share lessons learned and hone approaches for future and emerging areas which will be experiencing these issues in the future.											
Provide guidance to the General Land Office Purchase of Development Rights Program to identify areas where their farm and ranchland priorities overlap SGCN and rare communities habitat conservation needs. Identify collaborative landowner incentive programs that could work hand in hand with PDR program to secure perpetual protection of important ecological areas, landowner tax incentives and access to technical guidance programs for restoration to improve longterm resiliency of these sites.											
Support programs which could increase US Corps of Army Engineers monitoring and enforcement to ensure mitigation is being done and create a database for all federal and state agency mitigation recommendation and implementation tracking (Editor's Note: or review Conservation Registry to see if this tool could meet that need)											
Where wildlife and fisheries management are not the primary objective and where livestock production is the primary objective, refer landowners to partners who can assist them with best management practices for rotational and site-appropriate grazing management											
Designate serpulid reefs as a conservation area or state scientific area for protection.											

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Climate change adaptation: Develop models to predict climate change effects at a local scale, such as sea level rise, shoreline erosion, saltwater incursion, loss of cold water habitat, increase in and more frequent stand-replacing fires, etc. Identify habitats (and associated SGCN) that will be most affected by climate change. Develop strategies to conserve those habitats that can be conserved, and to increase resiliency of habitats in the face of climate change. Work with local communities to develop climate change adaptation plans, ensuring that conservation and resiliency of natural resources are addressed in the plan. For example, establishment of no-new-development zones or coastal land buy-back programs are preferable to hardened shorelines. Develop public programs that encourage or incentivize practices to facilitate climate change adaptation, such as removal of structures within predicted inundation zones as well as marsh restoration in these newly-relinquished areas. See Maryland's Climate Action Plan (http://www.mde.state.md.us/programs/Air/ClimateChange/Pages/Air/climatechange/legislation/index.aspx) for additional examples.											
Wintering range of the Whooping Crane is currently limited to Calhoun and Aransas counties and is expected to increase in winter range to Refugio and Matagorda counties if populations continue to increase. By protecting these habitat complexes, the habitat for additional species of concern would be protected including Reddish Egret,B rown Pelican, White-faced Ibis, Wood Stork, Bald Eagle, White-tailed Hawk and Peregrine Falcon. Other species that make up the ecological food web in coastal systems will be protected as well. Economically important species, such shrimp, crabs, oysters, redfish, spotted seatrout and left-eye flounder will also benefit from conserving the area that Whooping Cranes require and will require as well. Conservation Goal: The overarching goal is to delist the endangered Whooping Crane at 1000 individuals (following Alternative Criterion 1B), and to achieve this goal a significant amount of coastal habitat will be needed to support wintering territories (approximately 100,000 ac) (CWS and FWS, 2006). Currently, federally protected lands at Aransas National Wildlife Refuge (ANWR) can support up to 500 individuals (Tom Stehn, pers. comm.). Therefore, additional habitat proportional to the areal extent and habitat diversity protected at ANWR will be needed to accomplish the delisting criteria. The collaboration among several federal, state, and nongovernmental organizations will be needed to achieve this goal and are currently working together to achieve this goal. Agencies which have been primarily involved in habitat acquisition/protection in coastal Texas include the U.S. Fish and Wildlife Service, U.S.D.A. Natural Resource Conservation Service, Texas Parks and Wildlife Department, and Mission-Aransas National Research Reserve (NOAA program). Nongovernmental organizations have secured additional funding, including The Nature Conservancy, Coastal Bend Bays & Estuaries Program, Inc., and Whooping Crane Conservation Association. Other organizations have actively been involved in the protection process including Ducks Unlimited and International Crane Foundation. Each of these entities collectively are committed to preserving the ecological integrity of the coastal environment in the wintering area of the Whooping Crane. Timeline for Goal and this Action: The unprotected habitats needed to achieve this goal are highly vulnerable to development pressure, as this section of the coast is currently experiencing land sales in large tracts to interested developers. Additional issues that should be addressed include Target areas that are needed for whooping crane conservation include lands adjacent national wildlife refuge, state parks and wildlife management areas, and conservation easements in the San Antonio-Nueces, Lavaca-Guadalupe, Colorado-Lavaca river basins and within the coastal counties they encompass. Since the expansion of whooping crane territories will increase with increasing population size, the acquisition/protection of these habitats is essential now to secure those habitats for the future. Therefore, all efforts to achieve this goal must be prioritized within the next 10 years. Supporting Information: The recovery plan for the Whooping Crane delineates delisting criteria, as well as describing management and research actions ongoing and proposed to ensure recovery. Funding level, time schedules, and priorities have been established that serve as a overall strategy to accomplish the goals. In addition, The Nature Conservancy has drafted a Conservation Action Plan encompassing the results of a stakeholder workshop conducted in February 2010 that will provide additional guidance and details for the											

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winter range issues and resolutions. The International Crane Foundation has secured funding for a Whooping Crane Conservation Biologist housed at U.S. Fish and Wildlife Service, Ecological Service office in Corpus Christi that is developing a database of all activities pertinent to the recovery of the Whooping Crane which can be used to assess progress of this goal. *References: Canadian Wildlife Service and U.S. Fish and Wildlife Service. 2006. International recovery plan for the whooping crane (revised). Ottawa: Recovery of Nationally Endangered Wildlife (RENEW) and U.S. Fish and Wildlife Service, Albuquerque, NM.*											

More actions are being reviewed in existing coastal conservation plans to determine overlap. Many of these will be incorporated during the public review period

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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