

## Cypress Creek Basin

### Associated Maps

River Basins.....	12
Sulphur River and Cypress Creek Basins.....	16
Minor Aquifers.....	26
Major Aquifers.....	27
Reservoirs.....	28

### Associated Tables

The Texas Priority Species List.....	1
--------------------------------------	---

### Priority Species

Group	Scientific Name	Common Name	State/Federal Status
Mussels	<i>Arcidens confragosus</i>	Rock pocketbook (mussel)	SC
	<i>Arkansia wheeleri</i>	Ouachita rock-pocketbook (mussel)	FE, SE
	<i>Fusconaia askewi</i>	Texas pigtoe (mussel)	SC
	<i>Lampsilis satura</i>	Sandbank pocketbook (mussel)	SC
	<i>Obovaria jacksoniana</i>	Southern hickorynut (mussel)	SC
	<i>Pleurobema riddellii</i>	Louisiana pigtoe (mussel)	SC
	<i>Quadrula nodulata</i>	Wartyback (mussel)	SC
	<i>Strophitus undulatus</i>	Creeper (mussel)	SC
Insects	<i>Somatochlora margarita</i>	Texas Emerald (Dragonfly)	SC
Fish	<i>Ammocrypta clara</i>	Western sand darter	SC
	<i>Anguilla rostrata</i>	American eel	SC

<i>Cycleptus elongatus</i>	Blue sucker	ST
<i>Erimyzon oblongus</i>	Creek chubsucker	ST
<i>Notropis atrocaudalis</i>	Blackspot shiner	SC
<i>Notropis chalybaeus</i>	Ironcolor shiner	SC
<i>Notropis maculatus</i>	Taillight shiner	SC
<i>Notropis shumardi</i>	Silverband shiner	SC
<i>Polyodon spathula</i>	Paddlefish	ST

## Location and Condition of Cypress Creek Basin

### Cypress Creek

The Cypress Creek basin has its origins in northeast Texas and drains an area of 2,812 square miles (TWDB 1997). The Cypress basin is contained within Interior Coastal Plains (BEG 1996). The landscape consists of rolling wooded hills and broad, frequently flooded, and densely vegetated stream bottoms. Big Cypress Creek's extensive floodplain is marked by numerous sloughs, oxbows and other wetlands that trap water and sediment following flood events, forming important wetland habitat. Typical floodplains are heavily wooded with semi-aquatic species (e.g. bald cypress) and undisturbed relative to uplands, which are extensively used for ranching. Land uses in the Cypress basin include: woodlands (66%), agriculture (28%), urban (5.5%), water (4.3%) (NETMWD 2000). Rainfall is abundant ranging from 35 inches per year at the western extreme of the basin to over 55 inches annually at the Louisiana border.

Caddo Lake was once one of the largest natural lakes in the South. Originally, it was impounded by a large log jam on the Red River, which was removed by the U.S. government in 1874 to facilitate navigation. In 1914 a dam was constructed near Mooringsport, Louisiana. The U.S. Army Corps of Engineers (USACE) completed a replacement dam in 1971. In 1993 Caddo Lake was recognized as an international wetlands site. Large multi-purpose (flood control and water supply) reservoirs constructed on Big Cypress include Lake O' the Pines and Bob Sandlin. The largest reservoir is Lake O' the Pines. It was constructed by USACE to control flooding in

Jefferson, Texas, which is located upstream of Caddo Lake. Northeast Texas Municipal Water District (NETMWD) controls releases when reservoir stage is below flood pool. There are nine smaller reservoirs in the watershed (excluding Caddo Lake); several of these provide cooling water for steam-electric power plants. Total storage capacity in the basin exceeds 790,000 acre-feet (TWDB, unpublished data). Black Cypress Bayou and Little Cypress Creek are unimpounded.

The economy of the basin is comprised of manufacturing, retail and wholesale trade, mineral production and agriculture (TWDB 1997). Intensive poultry operations are located in the upper watersheds of the major watercourses. Major cities include Marshall, Mount Pleasant, Atlanta, and Gilbert. In 1990, the population of the basin was 124,177 (TWDB 1997). Surface water sources supply about 89% of the water demand. Water management in the basin is controlled by several districts, which own and operate the large reservoirs. The Red River Compact apportions waters of the Red River basin among Oklahoma, Arkansas, Louisiana and Texas.

Three water body segments are listed as impaired on the 2004 draft 303(d) list (TCEQ 2005). Various areas of Caddo Lake are listed for different reasons, including depressed dissolved oxygen concentrations, mercury in largemouth bass and freshwater drum, and low pH. Big Cypress Creek Below Lake O' the Pines is listed for mercury in fish tissue, lead (chronic) in water, low pH, and depressed dissolved oxygen. Harrison Bayou is listed for depressed dissolved oxygen.

#### Associated Waterways

Cypress Creek contains two major tributaries, Black Cypress Bayou and Little Cypress Creek, join Big Cypress Creek near the town of Jefferson before entering Caddo Lake. In Louisiana Black Bayou and James Bayou feed into Big Cypress Creek, which joins the Red River near Shreveport, Louisiana.

## Reservoirs

Associated Reservoir	Location	Size (acres)	Max Depth (Feet)	Date Impounded	Water Level Fluctuation	Water Clarity	Aquatic Vegetation
Caddo Lake	On Big Cypress Bayou on the Texas-Louisiana state line, northeast of Marshall in Harrison and Marion counties	26810	20	First dam built in 1914, replaced in 1971	4-8 feet annually	Moderately clear to stained	Approximately 60% coverage dominated by native submerged and emergent aquatic vegetation
Lake Bob Sandlin	On Big Cypress Creek 5 miles southwest of Mount Pleasant in Titus, Camp, and Franklin counties	9460	66	1977	2-3 feet annually	Moderate, 2-4 feet visibility	Coverage less than 3% of the lake's total surface area. The dominant species is hydrilla.
Lake Cypress Springs	On Cypress Creek in the Cypress River Basin 15 miles northwest of Pittsburg in Franklin County	3450	56	1970	2-3 feet annually	Clear	Covers less than 10% of the lake's total surface area
Lake Gilmer	On Kelsey Creek in the Cypress River Basin, 15 miles north of Longview and 4 miles west of Gilmer	1010	28	2001	< 3 feet annually	Moderately clear	Low densities of native aquatic plants

Lake O' the Pines	On Big Cypress Creek in the Cypress River Basin, approximately 25 miles northeast of Longview in Marion, Morris, Upshur, and Camp counties	18700	49.5	1959	4-5 feet annually	Moderately clear	Coverage ranges from 15% to 20% of the lake's surface area. Dominant species include hydrilla, buttonbush, water primrose and American lotus.
Welsh Reservoir	On Swuanano Creek in Titus County, 10 miles southeast of Mount Pleasant	1465	50	1976	< 3 feet annually	Clear	Covers less than 5% of lake's surface area. Dominant species include coontail and southern naiad.

## Aquifers

Groundwater supplies are largely obtained from the Carrizo-Wilcox Aquifer. Cypress Creek and its reservoirs are all found over the Carrizo Aquifer in northeast Texas.

## Problems Affecting Habitat and Species

Major reservoirs have altered the flow regime in the Cypress basin. Operations of Lake O' the Pines have dramatically altered flow regimes downstream in Big Cypress Creek. Most notable is that pre-dam flows included peak flows exceeding 57,000 cfs while post-dam peak flows rarely exceed 3,000 cfs; variation in peak flows has been dramatically reduced. Low flows during the historically dry periods have noticeably increased following dam construction. Significant physical effects on riverine and floodplain habitat include: reduced floodplain connectivity, altered channel and habitat-forming processes, and altered sediment transport and deliver. Influences on biological processes, include reduced seed dispersal, encroachment of upland species into floodplains, alterations to spawning and foraging habitat and potential elimination of spawning cues for fishes.

The paddlefish (*Polyodon spathula*) has been greatly reduced in abundance and distribution throughout its range including the Cypress basin. Paddlefish spawn in the spring when water levels rise rapidly. After the larvae develop within deep pools the juveniles move into backwater habitats. Spring floods have been greatly curtailed in Big Cypress Creek, and this may have eliminated cues and conditions needed for spawning. In addition, the lack of floods has likely resulted in the degradation of shoal habitats that are critical spawning habitat for this species. In the past, paddlefish were stocked in Caddo Lake in hopes to recover populations in the Cypress basin which were extirpated in the 1960's. The bluehead shiner (*Notropis hubbsi*) is a state-threatened species that schools in backwaters and spawns from early May to July. It appears that late spring and early summer low flow conditions may be most conducive to successful spawning and recruitment, but its presence in oxbow lakes reveals a necessity for periodic overbank flows allowing dispersal between channel and oxbow habitats. Oil drilling and chicken

farming are presumed to have negatively impacted mussel populations.

Hydrologic modifications have not been the only negative impact to this system. Other perturbations, such as nutrient and contaminant loading, logging, and drainage and conversion of the watershed to agriculture or residential development, have altered the system. Growth of macrophytes in the upper reaches of Caddo Lake are problematic in that decay of this accumulated biomass leads to conditions of low dissolved oxygen. Exotic species such as hydrilla and water hyacinth are abundant. Caddo Lake also suffers from pollution of heavy metals and organic chemicals from multiple sources. In the past, this has even led to warnings to limit the consumption of large fish.

No major water development projects that affect the Cypress basin were identified in the state water plan (TWDB 2002). Black Cypress and Little Cypress reservoirs have been proposed in past water plans; Little Cypress, on Little Cypress Creek, was recommended as a unique reservoir site (TWDB 2002). Potential hydropower issues could develop for Lake O' the Pines.

#### Priority Research and Monitoring Efforts

- Monitor species of concern—Special studies and routine monitoring should be targeted at specific species of concern. Species-specific monitoring will provide population trend data and may be particularly important for species that are federally or state listed as endangered or threatened as well as those being considered for listing or delisting.
- Monitor taxonomic groups suspected to be in decline or for which little is known—Monitoring and special studies should also target particular groups of organisms that are suspected to be on the decline or for which little is known. Research across North America and Europe has documented the overall decline of mussels and amphibians. Distribution and abundance of paddlefish has been greatly reduced throughout its range due to primarily the construction and operation of dams. Little is known of the bluehead shiner, a state-listed species.
- Ensure adequate instream flows and water quality through evaluation of proposed projects and water diversions in the Cypress Creek basin. Continue participation

in the collaborative process (hosted by the Nature Conservancy and the Caddo Lake Institute) to identify flow conditions necessary to restore ecosystem functions in Caddo Lake and the Cypress basin and develop a research agenda to address critical information needs.

- Facilitate the availability of historical reports and associated data—Departmental and other publications containing biological data are not readily available and that situation inhibits the ability to document faunal changes through time in the state's rivers and streams.

#### Conservation Actions

- Conduct studies, monitoring programs, and activities to develop the scientific basis for assuring adequate instream flows for rivers, freshwater inflows to estuaries, and water quality with the goal of conserving the health and productivity of public waters in Texas.
- Participate in development of the State Water Plan through the 16 planning regions to assure consideration of fish and wildlife resources.
- Facilitate coordination of all TPWD divisions with other state and federal resource agencies to assure that water quantity and water quality needs of fish and wildlife resources are incorporated in those agencies' activities and decision-making processes.
- Review water rights and water quality permits to provide recommendation to the Texas Commission on Environmental Quality and participate as warranted in regulatory processes to assure that fish and wildlife conservation needs are adequately considered in those regulatory processes.
- Investigate fish kills and other pollution events that adversely affect fish and wildlife resources, make use of civil restitution and role as a natural resource trustee to restore those resources, water quality, and habitat.
- Continue to increase the information available to the public about conserving Texas river, streams, and springs with the goal of developing greater public support and involvement when important water resource decisions are made.