

**Electro-shock Fish Survey of the Pedernales River
for the
Lyndon B. Johnson National Historical Park and
Lyndon B. Johnson State Park and Historic Site**



**Prepared by the
Lower Colorado River Authority**

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Introduction

The Lower Colorado River Authority (LCRA) partnered with the National Park Service (NPS) and Texas Parks and Wildlife (TPW) to perform a fish survey along a stretch of the Pedernales River which is adjacent to the Lyndon B. Johnson National Historical Park and Lyndon B. Johnson State Park and Historic Site. The primary purpose of the survey was to augment previous fisheries work performed by Nature Conservancy biologists in 2002. The previous surveys documented 18 species of fish collected with seines in the shallow areas of the river. Study participants indicated a need for boat electrofishing in the deeper portions of the river. Thus, LCRA's sampling efforts were directed at electrofishing the deeper waters impounded by the two in-channel dams within the park.

Methods

Fish were collected with a Smith-Root GPP 5.0 (5,000 watt) boat mounted electrofisher on March 10, 2005 in two separate pools of the Pedernales River, one above the Jordan Dam, the other above the Johnson Dam. The edges of each pool were sampled in an upstream fashion. The boat was maneuvered slowly and methodically ensuring adequate coverage of each instream cover type such as trees, brush, and rocks. The deeper sections of the impoundments were sampled along transects, run shoreline to shoreline across the pool and spaced approximately 20 meters apart. A few seine transects were conducted in the free-flowing river below the Jordan Dam. Fish were retained for identification, photo documentation, and released.

Investigators

The samplers consisted of LCRA biological monitoring team: Dave Bass-Senior Aquatic Scientist, Bryan Cook- Senior Aquatic Scientist, and Dale Jurecka- Supervisor, Field Services. The three professional monitors have conducted over 150 fish surveys through the Colorado River basin in the last eight years. The crew regularly assists the Texas Commission on Environmental Quality and other river authorities with training new employees on fish collection techniques.

Dave Bass holds a BS in Zoology for Louisiana Tech and MS in Biology from Southwest Texas State University. Bryan Cook has a BS in Environmental Management and a MS in Aquatic Biology from Southwest Texas State University. Dale Jurecka Environmental Management (minor in Aquatic Biology).



Figure 1: LCRA Team conducting Electro-shock Fish Survey

Results

A total of 17 fish species were collected in during the survey (Table 1). The collection was diverse, representing seven families: Clupeidae (shad), Cyprinidae (shiners and minnows), Catostomidae (suckers), Centrarchidae (sunfish and bass), Atherinidae (silversides), Poeciliidae (live bearers), and Percidae (darters).

Common Name	Scientific Name
Largemouth Bass	<i>Micropterus salmoides</i>
Guadalupe Bass	<i>Micropterus treculi</i>
Orangespotted Sunfish	<i>Lepomis humilis</i>
Bluegill Sunfish	<i>Lepomis macrochirus</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Warmouth Sunfish	<i>Lepomis gulosus</i>
Common Carp	<i>Cyprinus carpio</i>
Red Shiner	<i>Cyprinella lutrensis</i>
Blacktail Shiner	<i>Cyprinella venusta</i>
Texas Shiner	<i>Notropis amabilis</i>
Bullhead Minnow	<i>Pimphales vigilax</i>
River Carpsucker	<i>Carpionodes carpio</i>
Gray Redhorse	<i>Moxostoma congestum</i>
Gizzard Shad	<i>Dorosoma cepedianum</i>
Brook Silverside	<i>Labidesthes sicculus</i>
Texas Logperch	<i>Percina carbonaria</i>
Western Mosquitofish	<i>Gambusia affinis</i>

Table 1: Fish Collected on March 10, 2005 by boat electrofishing.

Discussion

The survey resulted in three new species of fish: orangespotted sunfish, river carpsuckers, and Texas shiners. Several brook silversides were collected and sent to Dr. Tim Bonner at Texas State University for positive identification. He confirmed the fish were brook silversides and noted the fish is well west of its range. Other species of interest were Guadalupe bass (the state fish of Texas) and Texas logperch, both of which are indicative of high water quality as they are intolerant to pollution.

No channel catfish, flathead catfish, or spotted gar were collected. These species are common in the river and should be present in the deeper habitats at the park. LCRA collected a total of 24 species of fish from the river in two surveys during 2000 at Hammett's Crossing (35 miles downstream of the park) (Table 2). The surveys were conducted in the spring and fall using a combination of electrofishing and seining. The primary difference between this survey and the one at Hammett's is the presence of more species of darters (orangethroat and dusky), sunfish (redbreast and longear). The darter species required constant flow in riffle areas (which are not present in the impoundments), but may exist below the dams. Thus more sampling in these locations should produce orangethroat and dusky darters within the park boundary. Longear and redbreast sunfish should be present at the park and future sampling should encounter those species. Overall, the list provides a good guideline of fish that could be collected at the park.

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Texas Logperch	<i>Percina carbonaria</i>
Western Mosquitofish	<i>Gambusia affinis</i>
Rio Grande Cichlid	<i>Cichlasoma cyanoguttatum</i>
Orangethroat Darter	<i>Etheostoma spectabile</i>
Smallmouth Buffalo	<i>Ictiobus bubalus</i>
Redbreast Sunfish	<i>Lepomis auritus</i>
Longear Sunfish	<i>Lepomis megalotis</i>
Dusky Darter	<i>Percina sciera</i>
Central Stoneroller	<i>Camptostoma anamalum</i>

Table 2: Fish collected at Hammett's Crossing, Pedernales River- 2000.



Figure 2: Largemouth Bass (*Micropterus salmoides*)



Figure 3: Guadalupe Bass (*Micropterus treculi*)



Figure 4: Orangespotted Sunfish (*Lepomis humilis*)



Figure 5: Bluegill Sunfish (*Lepomis macrochirus*)



Figure 6: Green Sunfish (*Lepomis cyanellus*)



Figure 7: Warmouth Sunfish (*Lepomis gulosus*)



Figure 8: Common Carp (*Cyprinus carpio*)



Figure 9: Red Shiners (*Cyprinella lutrensis*)



Figure 10: Blacktail Shiner (*Cyprinella venusta*)



Figure 11: Red Shiner [Top], Texas Shiner (*Notropis amabilis*) [Center] and Brook Silverside



Figure 12: Bullhead Minnow (*Pimphales vigilax*)



Figure 13: Bryan Cook with River Carpsucker (*Carpiodes carpio*)



Figure 14: Gray Redhorse (*Moxostoma congestum*)



Figure 15: Dale Jurecka with Gizzard Shad (*Dorosoma cepedianum*)



Figure 16: Brook Silverside (*Labidesthes sicculus*)



Figure 17: Texas Logperch (*Percina carbonaria*)



Figure 18: Western Mosquitofish (*Gambusia affinis*)