

A Proposal to Document Fish Diversity in the James River Watershed

A 1989 Texas Water Development Board report described the James River watershed (including Little Devils River) as one of the least disturbed streams in Texas. In 2010, Tyson Broad's report to Environmental Defense Fund, "The unknown river of Central Texas" (available at http://southllano.org/blog/wp-content/files/James_River_Report_Draft_203.18.101.pdf), characterized the river as still relatively unchanged, being still an unspoiled resource that provides exceptionally high quality habitat and water. This precious aquatic ecosystem has apparently remained healthy due to numerous headwater springs and relatively low levels of land-and water development, however, Broad's report suggests that base flows and water quality are threatened by increasing land fragmentation, increased groundwater use, loss of riparian habitat, and encroachment of juniper species. He recommends establishment of regional stakeholder interest groups to provide basin-wide conservation collaboration, as well as inventories and monitoring of both hydrological and biological condition of the watershed to establish baseline data and improve understanding of the region's natural resources while also providing a basis for future detection of changes.

Fishes are recognized by most as an economically and recreationally vital resource, and fish communities are excellent indicators of aquatic and terrestrial ecosystem health. However, the fish fauna of this important river has never been previously scientifically documented or monitored in any way. Characterizing the fish community is a necessary first step in protecting and conserving the James River's ecological condition. The University of Texas at Austin's Texas Natural History Collection (TNHC, <http://www.utexas.edu/tmm/tnhc/>), a science research division of the Texas Natural Science Center (until recently known as the Texas Memorial Museum), here proposes to conduct a fish survey of the James River watershed to provide a baseline inventory of its fish fauna, as well as to test predictions of fish occurrences. Since the James watershed is considered to be in pristine condition, this area offers an ideal setting to test recent computer-generated predictions of what fishes should reside in the watershed and thus improve understanding of the relationships between fish species and their environments, water quality and land use practices statewide.

The Fishes of Texas Project database compiled by TNHC consists of records vouchered by specimens curated at 42 U.S and international museums. Containing data from an estimated 95% of all fish specimens ever collected in Texas, all known Texas freshwater species are included in this database's nearly 100,000 records dating from 1854 to present. This extensive database holds 1693 fish species records from 181 sample localities that document 56 species (Table 1) as occurring in Mason, Kimble, Kerr, and Gillespie counties (Figure 1). However, none of those records are from the James River watershed, which has never been collected with deposition of specimens in museums. This lack of historic scientific sampling, the relatively pristine nature of the region, and increased shareholder involvement through organizations such as the South Llano Watershed Alliance, combine to make this drainage an ideal focus for a scientific fish survey.

We thus propose to collect fish specimens throughout the entire James River watershed to not only provide valuable documentation of its fish fauna, but also as a scientific test of the ability of our computer models to predict the distributions of the state's more than 270 freshwater fish species. The fish occurrence data will be made available to researchers, managers and the public through the standard web database of the TNHC and the Fishes of Texas Project website (<http://www.fishesoftexas.org>). We will also publish a report on the survey, and it is our hope that local landowners will find both the report and the archived original data useful in their future management of natural resources on their own properties and throughout the watershed.

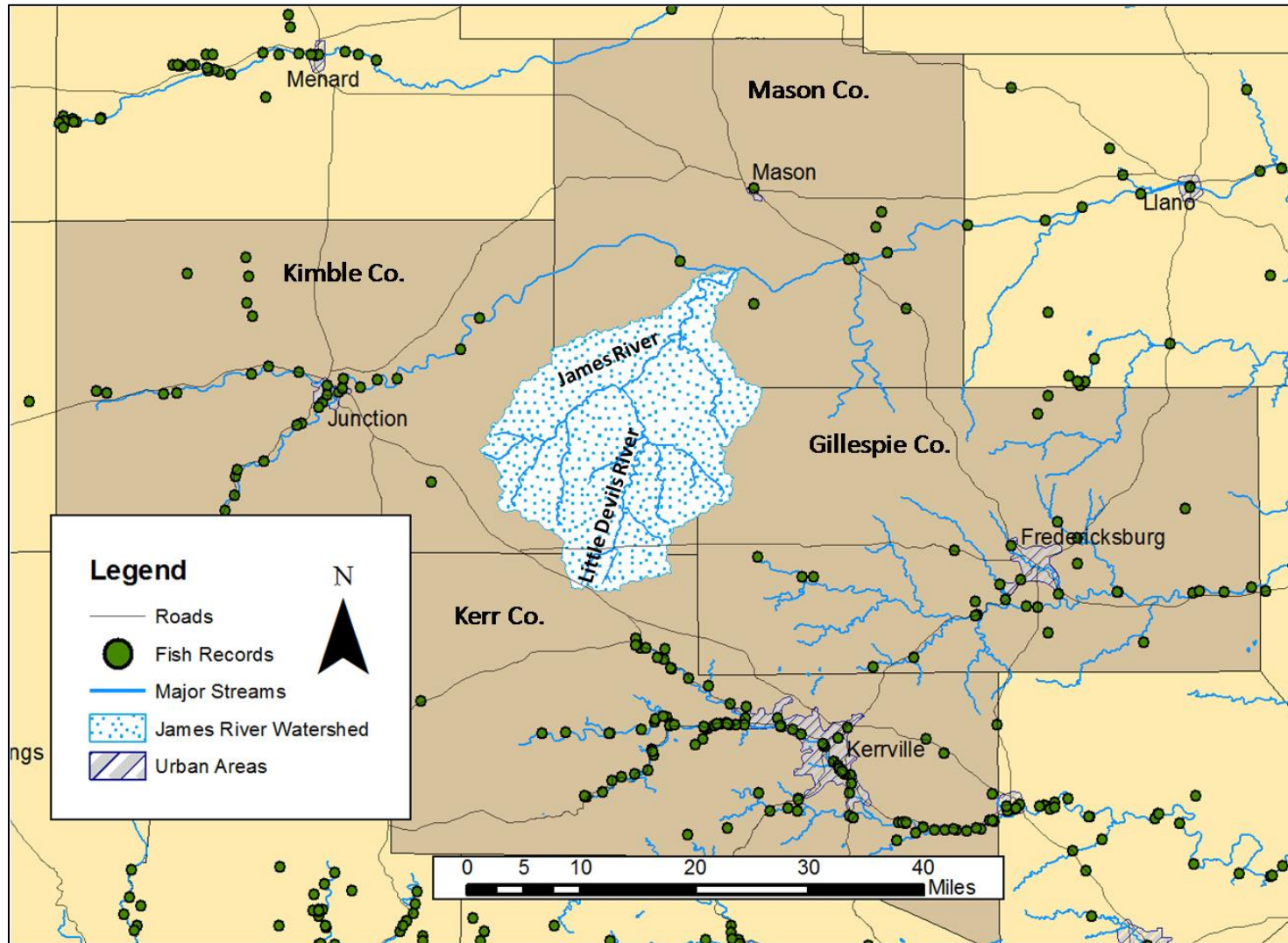


Figure 1. Map of the James River Watershed and surrounding counties with historic fish sampling records from the Fishes of Texas Project database maintained at the Texas Natural History Collection, University of Texas at Austin

Table 1. Fish species known from Mason, Kerr, Gillespie, and Kimble counties

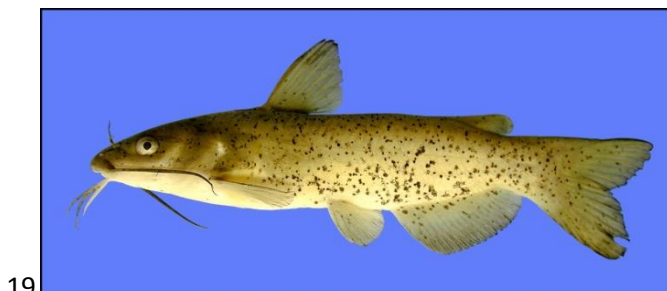
No.	Genus species	Common Name	No.	Genus species	Common Name
1	<i>Ameiurus melas</i>	black bullhead	29	<i>Lepomis microlophus</i>	redear sunfish
2	<i>Ameiurus natalis</i>	yellow bullhead	30	<i>Lepomis miniatus</i>	redspotted sunfish.
3	<i>Astyanax mexicanus</i>	Mexican tetra	31	<i>Macrhybopsis aestivalis</i>	speckled chub
4	<i>Camptostoma anomalum</i>	central stoneroller	32	<i>Macrhybopsis marconis</i>	burrhead chub
5	<i>Carpionodes carpio</i>	river carsucker	33	<i>Menidia beryllina</i>	inland silverside
6	<i>Cichlasoma cyanoguttatum</i>	Rio Grande cichlid	34	<i>Micropterus punctulatus</i>	spotted bass
7	<i>Cyprinella lutrensis</i>	red shiner	35	<i>Micropterus salmoides</i>	largemouth bass
8	<i>Cyprinella venusta</i>	blacktail shiner	36	<i>Micropterus treculii</i>	Guadalupe bass
9	<i>Dionda nigrotaeniata</i>	Guadalupe roundnose minnow	37	<i>Minytrema melanops</i>	spotted sucker
10	<i>Dorosoma cepedianum</i>	gizzard shad	38	<i>Moxostoma congestum</i>	gray redbhorse
11	<i>Erimyzon sucetta</i>	lake chubsucker	39	<i>Notemigonus crysoleucas</i>	golden shiner
12	<i>Etheostoma lepidum</i>	greenthroat darter	40	<i>Notropis amabilis</i>	Texas shiner
13	<i>Etheostoma spectabile</i>	orangethroat darter	41	<i>Notropis braytoni</i>	Tamulipas shiner
14	<i>Fundulus grandis</i>	Gulf killifish	42	<i>Notropis shumardi</i>	silverband shiner
15	<i>Fundulus zebrinus</i>	plains killifish	43	<i>Notropis stramineus</i>	sand shiner
16	<i>Gambusia affinis</i>	western mosquitofish	44	<i>Notropis texanus</i>	weed shiner
17	<i>Gambusia geiseri</i>	largespring gambusia	45	<i>Notropis volucellus</i>	mimic shiner
18	<i>Hybopsis amnis</i>	pallid shiner	46	<i>Noturus nocturnus</i>	freckled madtom
19	<i>Ictalurus lupus</i>	headwater catfish	47	<i>Percina apristis</i>	Guadalupe darter
20	<i>Ictalurus punctatus</i>	channel catfish	48	<i>Percina caprodes</i>	logperch
21	<i>Lepisosteus oculatus</i>	spotted gar	49	<i>Percina carbonaria</i>	Texas logperch
22	<i>Lepisosteus osseus</i>	longnose gar	50	<i>Percina macrolepida</i>	bigscale logperch
23	<i>Lepomis auritus</i>	redbreast sunfish	51	<i>Pimephales promelas</i>	fathead minnow
24	<i>Lepomis cyanellus</i>	green sunfish	52	<i>Pimephales vigilax</i>	bullhead minnow
25	<i>Lepomis gulosus</i>	Warmouth	53	<i>Polydactylus octonemus</i>	Atlantic threadfin
26	<i>Lepomis humilis</i>	orangespotted sunfish	54	<i>Pomoxis annularis</i>	white crappie
27	<i>Lepomis macrochirus</i>	Bluegill	55	<i>Pylodictis olivaris</i>	flathead catfish
28	<i>Lepomis megalotis</i>	longear sunfish	56	<i>Umbrina coroides</i>	sand drum



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We are seeking the cooperation and assistance of land owners throughout the James River and Little Devils River watersheds for access to springs, rivers, streams and any other temporary or permanent water bodies to conduct fish sampling. Our sampling methods will include standard battery-powered electrofishing and netting done by experienced small crews of staff, students and volunteers from University of Texas at Austin. All methods have been widely used and approved for such projects statewide. All required permits (TPWD Scientific Collecting and University of Texas Institutional Animal Use [IACUC] protocol) are in place and available to landowners on request. Field crews will range from 2 to 6 people in one or two vehicles. We may eventually select some sites for multiple sampling efforts (as many as 3 – 4 samples over a year) but most sites will likely be visited and sampled no more than once.

We are happy to consider any restrictions property owners may wish to impose, and are always respectful of private property. Note also that we are in close contact with other biologists at Texas Parks and Wildlife (Drs. Gray Garrett and Timothy Birdsong) and Texas State University San Marcos (Dr. Tim Bonner) who are sampling in the South Llano basin (mostly outside of the James River watershed) for the Guadalupe Bass Initiative. We will be reciprocally sharing data and coordinating with these groups to minimize redundant sampling.

We are prepared to start sampling in January of 2011 and would continue the project until at least September or longer, pending availability of funding. Our schedule is somewhat flexible, though obviously we would like to minimize travel by sampling as many locations as possible on single trips. Our budget is limited and to help minimize travel from Austin we will be prepared to camp at sample sites (with landowner permission, of course) and if longer trips are possible, we may sometimes base our operations out of the TTU Junction campus field station.

Please contact us if you would like to permit fish sampling on your property or if you would like additional information about this project or have any questions about it.

Our project team can be reached at:

fishesoftexas@gmail.com

or write or call the project director at the contacts provided below

Thank you for your help!

December 1, 2010



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