



# The TXNDD Report

**The Fishes of Texas** project (FoTX: [www.fishesoftexas.org](http://www.fishesoftexas.org)), based out of Dr. Dean Hendrickson's lab at the University of Texas at Austin, holds over 124,000 specimen-based records from 42 institutions. It originated in 2006 and was first made public on the internet in 2008. It remains the most reliable (quality controlled) and data-rich site for occurrence observation data for Texas fishes. The project aims to document the spatial distributions of fishes through time via museum specimens, which provide the most verifiable form of occurrence observations. These data allow fact-based conservation and management of Texas fishes and their ecosystems. The data have been used in computerized niche modeling to support finer-scale interpretations than the raw data allow, as well as prediction of distribution shifts over time under differing climate change scenarios. These methodologies also support applications in basic ecological research, conservation planning, determinations of conservation rankings, and redefinitions of historical and current distributions. The data also help discover new species, and species not previously recorded from Texas.



To learn more: <http://hdl.handle.net/2152/45933>

The members of FoTX have been working closely with The Texas Natural Diversity Database (TXNDD) to greatly enhance Texas Parks and Wildlife Department's (TPWD) fish data holdings. This collaborative effort will greatly improve NatureServe's ability to accurately inform global and state rankings for use in conservation applications. Improving the TXNDD's data is important since they influence conservation-related research and activities within the state, often with economic, and other practical implications. In 2015, FoTX provided their specimen-based museum occurrence records of all fishes on the Texas' Species of Greatest Conservation Need (SGCN) list to the TXNDD to incorporate into its database.

Since the FoTX team had already undertaken the time-consuming step of georeferencing nearly every specimen in the database (i.e., assigning coordinates and associated error to a specimen record based on its locality information), the first step for the TXNDD was to create Source Features for those records that passed certain criteria. This process followed NatureServe methodology and consisted of reviewing SGCN species records that passed the criteria to: 1) decide which observations should be combined into Source Features and which should be kept separate (based on the spatial arrangement of the data); 2) determine how to best represent these Source Features on the map (based on the level of detail provided in the locality information); and 3) bulk import the shapes and associated data into Biotics 5 (the TXNDD cloud-based database). To achieve the first two steps, the data were evaluated in ArcGIS along with already existing fish features from the TXNDD using custom Python-based scripting tools. Bulk importing of the shapes was completed using built-in functionality in Biotics, and bulk import of the associated data was achieved via Excel to format the data and SQL to bulk load them.

Here is how this process broke down in numbers:

- 9,862: The number of SGCN records that were extracted from the Fishes of Texas database
- 6,335: The number of the abovementioned records that passed all criteria for import into the TXNDD (error < 8 km; occurred in Texas; taxonomy confirmed; specimen not considered suspect by Fishes of Texas staff)
- 2,484: The number of new fish Source Features added to the TXNDD as a result of this process.

The next steps for the TXNDD are to aggregate these Source Features into Element Occurrences. Once the Element Occurrences have been created and the SGCN species state rankings are reviewed, and possibly re-calculated, the updated rankings will be reflected on the FoTX website.

In addition to improving the TXNDD with FoTX data, Laura Dugan has been working closely with FoTX staff to determine conservation rankings for the Mexican blindcat (*Prietella phreatophila*), which was recently discovered in Texas in a cave near Lake Amistad, but was previously known only from México. This conservation assessment will be featured in a publication on the species



In the last several years, FoTX staff have worked to develop a collaborative relationship with TPWD staff. In addition to the increased data sharing, joint publications and collaborative field work, TPWD Inland Fisheries staff are now routinely depositing specimens, for permanent archiving, into the University's collections related to their special research projects (Heart of the Hills Fisheries Science Center), routine sampling (River Studies Program), and fish kill response (Kills and Spills Team), and those data will eventually go into the FoTX database too.

**Jennifer Bronson Warren** started with Texas Parks and Wildlife Department as an intern after graduating with her bachelor's degree from Texas A&M Corpus Christi. Her first project was collecting environmental data along the Texas coast under the EPA funded Coastal 2000 program (now called the National Coastal Assessment). After five years on the coast, she was hired as a regional biologist with the Water Quality Program (WQP), and relocated to Waco. For the past ten years, Jennifer's work has focused mostly on freshwater environments and water quality issues. Her work includes reviewing wastewater discharge permits, participating in regional initiatives to address local water quality issues such as watershed protection plans, helping plan and conduct field-based research, and working with landowners. She is also part of the Kills and Spills Team (KAST), an intra-divisional team that responds to fish kills, pollution complaints, wildlife kills, and large pollution events.

The Water Quality Program (housed within the Water Resources Branch) and the Kills and Spills Team (Inland and Coastal Fisheries) benefit from the TXNDD by being able to quickly identify if species of concern are in an area where a dewatering for construction may occur. The WQP maintains a quality assurance project plan for the majority of their projects and with field-based research conducted by the WQP, they have the potential to collect species of interest to TPWD. These data can be submitted to the TXNDD to supplement existing records or to create new ones. For the KAST program, TXNDD data are useful during a large spill event (natural or man-made) by allowing KAST staff to pinpoint areas that need special protection, in turn, helping them to determine what type of equipment and materials are needed to protect sensitive habitat and organisms.



Photo: Jason Singhurst

**Jennifer Bronson Warren**, Water Quality Program, at peat bog in Milam County, September 2016.



Photo: Cindy Hobson

**Jennifer Bronson Warren** on Pin Oak Creek, Milam County, March 2016.

For Jennifer, the TXNDD data assist her with many of her projects. For example, she references the Element Occurrences for species of concern in areas with proposed new wastewater outfalls and areas with an on-going fish kill. Depending on what element species are present, she will work with the other parties (internally and externally) involved to find a solution.

Jennifer has also been able to work with private landowners interested in cataloging the biological communities on their properties. Jennifer, and the Nongame and Rare Species Program community ecologist, Jason Singhurst, recorded unique plant species recently found along a sand hill seep and peat bog and are being prepared by Jason for entry into the TXNDD. The biologists recorded unique species that will assist the landowners with their land management plans. By having the data in the TXNDD, they are also available to consultants and developers which will help to minimize impacts of development projects for the conservation of these species.

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