

Summary of Investments by the Texas Parks and Wildlife Department in the Devils River Basin



Texas Parks & Wildlife Department Responsibilities in the Devils River Basin

For more than 30 years, the Texas Parks and Wildlife Department (TPWD) has prioritized the Devils River for investments in ecological research, biological monitoring, and conservation of natural and cultural resources. Since 1988, TPWD has owned and managed the 19,000-acre Del Norte Unit of the Devils River State Natural Area (DRSNA). The 18,000-acre Dan A. Hughes Unit of the DRSNA was added in 2011. In addition to managing and conserving natural and cultural resources at these two TPWD-owned riverside properties, TPWD offers technical guidance and financial incentives for conservation on private lands in the basin. TPWD also closely cooperates on river and watershed management activities with The Nature Conservancy of Texas (TNC), which owns and manages the 4,788-acre Dolan Falls Preserve (DFP) and has interest in an additional 129,521 acres in the basin through either conservation easements or fee title ownership.

Since acquiring the Dan A. Hughes Unit in 2011, TPWD has substantially expanded its investments in the basin to include delivery of a standardized aquatic resources monitoring program; collaborative research to fill gaps in understanding of the relationships among groundwater levels, spring discharge, river flows, fish and wildlife habitat suitability, and river-oriented recreation; and formation of new or expanded partnerships with non-governmental organizations and landowners to deliver collaborative stewardship on public and private lands. Research and monitoring efforts have centered on the status, trends, and habitat requirements of the 21 native freshwater fishes and mussels that occur in the basin. Five of those species are listed by the state as threatened, with the Devils River Minnow also being federally listed as threatened. Texas Hornshell, the only native freshwater mussel that occurs in the basin, is currently proposed for federal listing as endangered; a final listing decision by U.S. Fish and Wildlife Service is anticipated in spring 2018.

TPWD also manages river-oriented recreation on the Devils River through the Devils River Access Permit (DRAP). The DRAP sustainably manages the number of users that can access the river at the Del Norte and Dan A. Hughes Units of the DRSNA, which represent two of the primary public access points to the river. The DRAP is also required of paddlers who utilize four riverside paddler campgrounds, which are distributed longitudinally along the river to facilitate multi-day, overnight paddling excursions. Additionally, the Devils River supports a high-quality wilderness fishing experience for Smallmouth Bass, Largemouth Bass, and other species. These fisheries are managed by TPWD through routine monitoring of sport fish populations and use of harvest regulations, which currently include a catch-and-release regulation for black basses.

Texas Parks & Wildlife Department Devils River Basin Goals

TPWD's goals for management and conservation of natural and cultural resources of the Devils River Basin are informed by the Devils River Action Plan, available for download at the following link:

<https://tpwd.texas.gov/state-parks/devils-river/Documents/working-group-report-2>

The Action Plan contains recommendations developed by a diverse group of stakeholders, assembled and coordinated by TPWD. High-level goals identified by the Devils River Working Group include:

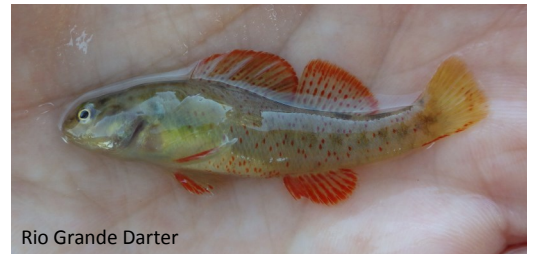
1. *Minimize land fragmentation in the watershed;*
2. *Maintain water quantity and quality;*
3. *Support the long-term sustainability of native fish populations;*
4. *Preserve the unique wilderness experience; and*
5. *Manage public access and use to avoid and minimize negative impacts to natural and cultural resources.*



Devils River Minnow



Texas Hornshell



Rio Grande Darter

Collaborative Research and Monitoring

Devils River Standardized Aquatic Monitoring Plan (Est. completion of summary report August 2018)

Developed by TPWD, the goal of the plan is to collect data necessary to monitor and protect fish, aquatic habitat, and the riparian corridor of the Devils River. Sampling includes annual fish community surveys with data collected on aquatic habitat use, bi-annual sportfish surveys, and genetic analysis of priority species. Current monitoring data (2012-2017) are being assessed and a summary report will be available next year summarizing fish community trends and habitat use, sport fish populations, and riparian habitat.

Development of Fish Habitat Suitability Criteria (Est. completion August 2018)

TPWD, in collaboration with TNC and the University of Texas– Bureau of Economic Geology (UT-BEG), is currently collecting seasonal fish and habitat data at select monitoring sites on the Devils River and Dolan Creek. These data will be used to refine current fish depth and velocity suitability criteria and develop temperature suitability criteria which will be incorporated into a new 2-dimensional hydrologic model to assess changes in habitat availability as a function of stream flow.

Recreational Use Assessment (Report available January 2018)

In March 2017 TPWD opened two paddle-up camping sites through TPWD's River Access and Conservation Areas Program in an effort to allow for a more enjoyable multi-day paddling experience and alleviate ongoing trespassing issues. To assess the success of these new campsites, TPWD created a user exit survey to gauge paddler experience with a focus on angling, camping, and paddling. The results of this survey, in conjunction with paddler counts, will be evaluated to determine campsite effectiveness and develop stream flow recommendations suitable for recreation. This is an ongoing study; however, a preliminary assessment and report will be available in January.

Longitudinal Survey of Priority Species *(Report available May 2018)*

TPWD is currently conducting longitudinal surveys of the Devils River, from the headwaters to the DRSNA– Dan A. Hughes Unit, to map mesohabitats, instream vegetation locations, and the presence of three priority species: Texas Hornshell, Devils River Minnow, and Conchos Pupfish.

Hydraulic Habitat Model Development for the Devils River *(Project completed 2014; updated model pending)*

TPWD and Texas State University collected data and created 2-dimensional hydraulic models for two 500-m sites on the Devils River at TPWD's Del Norte Unit and one site on Dolan Creek. Due to a lack of variability in stream flows during the study period, only a narrow range of discharges were modeled. TPWD, TNC, and UT-BEG are currently working to collect data that will be used to develop a new hydraulic habitat model covering a larger area of river using a Lidar-derived digital elevation model, additional input flow conditions, and temperature data. The new model, which is still in the planning stages, will evaluate updated fish and mussel habitat suitability criteria to predict changes in weighted usable area as a function of stream discharge.

Monitoring the Effects of Groundwater Level on Spring and Stream Discharge, Stream Temperature, and Habitat for Devils River Minnow in the Devils River *(UT-BEG-Section 6; Report available August 2018)*

The goal of this project is to better understand relationships among groundwater withdrawals, spring discharge, stream flow, and the availability of fish habitat in Dolan Creek and the Devils River at the DRSNA– Del Norte Unit and TNC's DFP. This study funded 2 years of data collection and the final report will address the following objectives:

- Assess groundwater level trends from monitoring wells at DRSNA– Del Norte Unit;
- Assess rainfall-runoff response of major springs feeding the Devils River;
- Characterize seasonal, longitudinal temperature changes within Devils River Minnow habitat; and
- Develop a stage-discharge relationship for the Devils River at DRSNA– Del Norte Unit.

Airborne Lidar Bathymetry Survey and Aquatic Habitat Evaluation for Devils River Minnow and Texas Hornshell Mussel in the Devils River *(UT-BEG-State Wildlife Grant; Report available August 2020)*

The objectives of this study are to continue collection of baseline groundwater and surfacewater hydrologic data in the Devils River Basin, as well as, collect new data specific to suitable Texas Hornshell habitat. Additionally, in support of future development of an updated hydrologic-habitat model, UT-BEG will collect Lidar data and create a digital elevation model (DEM) of the Devils River from the headwaters at Pecan Springs to the DRSNA Dan A. Hughes Unit and of Dolan Creek at TNC's DFP. Completion of this study will provide:

- Additional year of baseline data on groundwater levels, spring and stream discharge, and stream temperature;
- Creation of a digital elevation model of the Devils River, Dolan Creek, and riparian corridors;
- Collection of hydrologic data in known suitable habitat for Texas Hornshell; and
- Meet with Texas Water Development Board staff to integrate relevant data from both UT-BEG studies into the Hydrogeologic Study of Val Verde County.

Thermal tolerance of Texas Hornshell from the Rio Grande Basin *(TAMU-Section 6; Report available August 2020)*

This study will investigate thermal limits of Texas Hornshell from the Rio Grande and Devils Rivers. This will assist TPWD with development of habitat suitability criteria for this species. Completion of this study will provide:

- Lethal and sublethal tolerances for adult and larval Texas Hornshell for use in habitat availability modeling;
- Assessment of current trends in water temperature in the Rio Grande Basin; and
- Quantification of genetic variation across all known United States populations.



Partnership with the Devils River Conservancy

TPWD collaborates with the Devils River Conservancy (DRC) to educate, inform, and engage landowners in land stewardship and watershed management practices that conserve natural and cultural resources in the basin. This has been accomplished through community outreach events, educational workshops and trainings, distribution of issue papers, and coordination of service learning events. The DRC maintains an effective communications network within the basin, and a potential opportunity exists to cooperate with the DRC to ensure stakeholder awareness and participation in the Val Verde County Hydrogeology Study, particularly by rural landowners in the basin.

Research and Monitoring Deliverables Timeline

FY 2018

- Fall 2017*: UT-BEG completes data collection for Section 6 project, begins analysis.
- Jan 2018*: Evaluation of paddler campsite effectiveness and recreation flow needs on the Devils River.
- Feb 2018*: UT-BEG to collect Lidar data on the Devils River and Dolan Creek.
- Spring 2018*: Continued longitudinal surveys of priority species.
- August 2018*: UT-BEG Section 6 project final report due.
- TAMU Texas Hornshell project data collection and lab trials.
- Seasonal fish community and habitat data collection in collaboration with UT-BEG stream temperature data collection.

FY 2019

- Fall 2018*: Completion of data collection for UT-BEG SWG project.
- Fall 2018*: Annual fish community monitoring.
- Development of 2-dimensional hydraulic model.
- TAMU Texas Hornshell project data collection and lab trials.

FY 2020

- Fall 2019*: Annual fish community monitoring.
- August 2020*: UT-BEG SWG project final report due.
- August 2020*: TAMU Texas Hornshell final report due.

