

Summary: Chad Hargrave, Ichthyofauna (Freshwater Fish)

Dr. Chad Hargrave, Center for Biological Field Studies and Sam Houston State University, is a fish expert. As an Inventory Group leader for the Thicket of Diversity, Hargrave has researched fish and stream ecology in the Big Thicket National Preserve. According to the biologist at a presentation at the Logon Café on July 28th, 2011, human impact is reducing diversity. By some estimates the planet is experiencing a loss of 10,000 species per day. This concern was the basis for his study.

Dr. Hargrave began his Big Thicket research in 2006. In 2008 he received funding of \$5366 by the ToD for “Influence of Local Microhabitat Structure on Ichthyofauna in the Big Thicket National Preserve (BTNP). In a survey of six BTNP water corridors, Big Sandy Creek, Turkey Creek, Menard Creek, Village Creek, Neches River and Little Pine Island Bayou, Hargrave’s team identified 44 species of fish. Although all streams shared a core of common species, four assemblage types were unique among water corridor units. Thus, regional factors and local variations both contributed to species richness.

In 2009-10 Hargrave’s second ATBI grant was funded, “Identifying Temporal Variation in Fish Assemblages across Water Corridor Units in the BTNP” for \$9112. To extend sampling, the researcher added the time component and collected fish monthly from two locations in the six stream corridors. This resulted in a collection of 62 species representing 18 fish families.

Sam Houston State University research also included a study on structure. At the West Gulf Coastal Plain and Big Thicket Science Conference in Nacogdoches, Hargrave’s graduate student KP Gary, reported on “How Riparian Protection can Affect Ecosystem Structure and Function in Low Gradient Streams.” An experiment was conducted with artificially created structure. It was noted that fish populations grow when structure is introduced. It was thus determined that instream habitat is important to species richness and for growth and health of species.

Dr. Hargrave extended his study to compare the six BTNP water corridors with six sister waterways that were similar in size, physical features and location but were unprotected. He found that darters, which are more sensitive, were not found in unprotected streams. The non-protected waterways, chiefly impacted by agriculture, were dominated by silt. This study confirmed that the protection of riparian zones, the forests lining streams, protects diversity and is critical for maintaining species richness.

Fish collected were identified and returned to the stream. If identification was questioned, they were sent to the laboratory and placed in 70% ethanol for long-term archival storage in the Sam Houston State University Vertebrate Museum. Permits for inventory collection are required by the BTNP. Data is shared with the Thicket of Diversity ATBI and input into a national database

with the US Park Service. The information will assist resource managers in conservation decision making.

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In 2026, ToD Chair Mary Johnston and Intern, Natalia Doiron, reviewed past data and organized files. The 62 fishes first recorded in the 2012 Tally grew to 70 after review of later files and reports. A listing of 13 species *New to Park* and their names was found in an Excel file. There was no verification data other than the list of names so the information was recorded as historical.

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