

TWRI Mills Scholarship Application

Student Name/UIN: Anthony William Rodger; UIN #:

Address:

Email:

Phone Number:

Undergraduate GPA: South Dakota State University

Courses Taken/Grade: Ichthyology, Fisheries Management, Fish Ecology, Limnology, and Fisheries and Wildlife Biometrics

Graduate GPA: Currently Texas A&M University

Courses Taken/Grade: Community Ecology, Statistics in Research I, *In progress*

Population Dynamics and Statistics in Research II

GRE Scores: Verbal, Quantitative, Writing

Faculty Advisor: Dr. Kirk Winemiller

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Proposed Use of Funds: If awarded this scholarship some of the funds would be used to help offset the cost of tuition and fees for the upcoming school year. I would also use some of the money to hire undergraduate students in the Wildlife and Fisheries Department to provide them with an opportunity to gain research experience by assisting with the field and laboratory work.

Intended Career Path: After obtaining my master's degree I want to pursue a career in fisheries management for either a state, or federal agency.

Research Description: See below

Flow dependent species: life history and habitat associations in Texas Gulf Coast Rivers

Instream flow science is a rapidly growing field that integrates hydrology and hydraulics, biology, physical processes and geomorphology, and water quality to answer the question, “how much water should be in the river?” (NRC 2005). In Texas this is a question of growing importance because the population is expected to increase 82% between the years 2010 and 2060; increasing from 25.4 million to 46.3 million people. Water use is expected to concurrently increase 22% with the rise in population (TWDB 2012). Population growth and its accompanying increase of urban water demands, coupled with Texas’ variable river flow conditions and the southern Great Plains predicted climate shift that anticipates rising temperatures, higher frequency of heat-stress events, and severity of droughts (U.S. National Assessment Team, 2001) will likely lead to increased episodic water shortages and conflicts as goals for conservation of fish and wildlife clash with human needs. To attempt to address this challenge the state of Texas passed Senate Bill 2 (2001), which initiated the Instream Flow Program that mandates the Texas Water Development Board, Texas Parks and Wildlife Department, and the Texas Commission on Environmental Quality to work together to create an evaluation program based on continuous instream flow data collection and conduct studies to determine flow conditions that maintain a “sound ecological environment” (NRC 2005).

My project objective is to provide instream flow recommendations for two sub-basins in Texas: the lower Brazos River and the middle Trinity River, by targeting fluvial specialists in the Cyprinidae family and collecting information on the environmental conditions, namely discharge, that contribute to life history factors such as reproduction, recruitment, and growth. Life history information of species sensitive to flow has and will continue to be a valuable source of information for developing instream flow recommendations that promote the conservation of species diversity in Texas’ rivers and streams. This project will study fluvial specialists that are sensitive to alternate flow regimes, brought on by anthropogenic changes to the environment, that occur in multiple basins, which will aid in the future conservation of fluvial specialists inhabiting similar river basins in Texas. Field work began in March 2013 and will continue until at least March 2014. Sampling trips were conducted on each river bi-monthly during the reproductive season, and once per month during the winter to spot-check for reproductive activity. Larval fish were collected throughout the night using driftnets and community assemblage surveys were conducted using a seine net. Lab work will aim to relate intra-annual flow pulses to the reproductive success of our target Cyprinidae species. To accomplish this objective estimation of larval fish hatch date, daily growth rate of larval and juvenile fishes, and gonadal somatic indices of adult fluvial specialists are being analyzed. This research will increase the existing limited knowledge on the life history of Cyprinidae species classified as fluvial specialists and assist in the preservation of species diversity in Texas rivers by promoting ecologically minded management strategies that lead to the conservation of native fish species.