Research Office
Long Range Planning Division
505 Deaderick Street, Suite 900
Nashville, TN 37243
TDOT.Research@tn.gov

Research Project Title

Advancing Urban Stream Restoration/Enhancement Practices for Compensatory Mitigation Credits

Purpose of the Project

The purpose of the project are to: 1) improve ecohydraulic design methodologies for urban stream restoration/enhancement that are more cost effective, 2) construct a stream restoration project in Knox County in order to assess improved design protocols to maximize functional lift calculations in the Tennessee Stream Quantitative Tool (TN-SQT) and assess the economics of project implementation in urban streams for compensatory mitigation, and 3) provide a training course for TDOT staff on the new design methods for urban stream restoration and the input requirements for the TN-SQT.

Scope and Significance

The scope of the research project includes:

- Identifying one or two project sites in Knox County, Tennessee, in urban stream(s) and complete initial geomorphic and biological surveys to estimate pre-construction TN-SQT values.
- Complete a fundamental modeling experiment on flow hydraulics and physical habitat, and a functional traits analysis using fish (biological) surveys to provide a basis for potentially simplifying the current TN-SQT.
- Design the stream restoration project(s), and obtain the necessary environmental permits.
- Propose project mitigation to the Compensatory Mitigation Tennessee Interagency Review Team (IRT) overseen by the US Army Corps of Engineers in Nashville, and request the mitigation ratio they would be willing to provide for the urban stream project.
- Prepare construction bid documents, implement construction of the urban stream restoration project; and complete post-construction geomorphic and biological surveys to support computing functional lift estimates using the current TN-SQT and a simplified version per study.
- Provide training to TDOT staff on ecohydraulic methods for urban stream restoration design.

Expected Outcomes

The following are expected outcomes of this research project:

- This research will improve urban stream restoration design approaches that are cost-effective.
- Demonstrate to the IRT Program the expected gain in functional lift from urban stream restoration/enhancement projects, creating new mitigation credit markets for TDOT.

Time Period

The time period for the project from December 1, 2018 through November 30, 2020.

Contact Information

Principal Investigator (PI):	**TDOT Lead Staff:**
John S. Schwartz, Ph.D., P.E. Department of Civil & Environmental Engineering University of Tennessee 413 John D Tickle Engineering Building Knoxville, Tennessee 37996 Phone: 1-865-974-7721 Email: jschwart@utk.edu	Paul Purnell Environmental Division / Mitigation Office 505 Deaderick Street, 9th Floor Nashville, Tennessee 37243 Phone: 1-615-532-9945 Email: paul.purnell@tn.gov