Urban Riparian & Stream Restoration Program

Clare Entwistle
Texas Water Resource Institute
Background

- Riparian and Stream Degradation is a major threat to:
  - Water quality
  - In-stream habitat
  - Terrestrial wildlife
  - Aquatic species
  - Overall stream health
Proper management, protection, and restoration can:

- Decrease bacteria, nutrient, and sediment loading
- Lower in-stream temperatures
- Improve dissolved oxygen levels
- Improve aquatic habitat
- Improve macrobenthos and fish community integrity
Project Goals

- Collaboration between Texas A&M AgriLife Research – Dallas Center and Texas Water Resources Institute.

- Project will increase awareness, education and the value of stream restoration
Project Goals

- Promote healthy watersheds and improve water quality through the delivery of Urban Riparian and Stream Restoration training programs in priority watersheds and an Advanced 3-day Stream Restoration training.

- Restoration Demonstration Site to show the benefits of riparian restoration on bank erosion and total suspended solids levels within the creek.
Educational Trainings

- 15 one-day trainings and 1 advanced three-day training in year 3.
- Geared toward professionals interested in conducting restoration projects
- Help attendees understand urban stream functions
  - what the impacts of development on urban streams look like
  - recognize healthy and degraded stream systems
  - assess and classify a stream using the Bank Erosion Hazard Index (BEHI)
  - Comprehend differences between natural and traditional restoration techniques
Training Outline

1. Hydrologic cycle
2. Introduction to stream morphology
   a) Bankfull discharge
   b) Stability
   c) Channel measurements
3. Stream classification
4. Stream instability
5. Stream restoration
6. Stabilization structures
7. Vegetation
8. Monitoring and evaluation
Urban Riparian and Stream Restoration Program

Training Agenda | 8:30 am - 4:00 pm

8:30 am  Welcome and Protecting Water Quality by Restoring Riparian Corridors
- Clare Entwistle, Texas Water Resources Institute

9:00 am  Stream Processes, Classifications of Streams, and Stream Restoration
- Dr. Fouad Jaber, Texas A&M AgriLife

11:00 am  Management and Photo Monitoring of Restoration / Stream Trailer Video
- Nathan or Destiny, Texas Water Resources Institute

11:30 am  Local Watershed Update
- Local Watershed Contact

12:00 pm  Lunch (Provided)

12:30 pm  Prepare for the Field
- Dr. Fouad Jaber, Texas A&M AgriLife

1:00 pm  Field Analysis Stations (30 minute Stations, bring boots or waders)
- Stream Inspection: Dr. Fouad Jaber, Texas A&M AgriLife
- Stream Surveying: Clare Entwistle & Nathan Glavy, TWRI
- Stream Substrate Analysis: Destiny Russell, TWRI
- Stream Trailer (4th station if available at location)

3:00 pm  Data Analysis, Course Evaluation and Wrap Up
Upcoming Training Locations

- **Dallas Area**
  - **Wednesday, February 21, 2018**
  - Upper Trinity Regional Water District

- **Seguin**
  - **Tuesday, March 20, 2018**
  - The Irma Lewis Seguin Outdoor Learning Center
  - Geronimo Alligator Creek Watershed Partnership
For landowners and land managers to decide to adopt and implement innovative measures and restoration, they must first be informed, understand the benefits and observe demonstrations.
Restoration Demonstration Project

- The demonstration site is owned by The Irma Lewis Seguin Outdoor Learning Center and the Texas Water Resources Institute is coordinating with partners including the Guadalupe-Blanco River Authority and the Geronimo and Alligator Creeks Watershed Partnership.

- The Geronimo and Alligator Creek Watershed Protection Plan, as does most watershed plans, includes implementing riparian forest and herbaceous buffers to reduce pollutant loads in the watershed.

- The demonstration will implement restoration of riparian buffers using natural bank stabilization techniques and planting native vegetation on one of the two sites.

- Both sites will be monitored to demonstrate the difference in bank erosion rates and total suspended solids in the creek.
Restoration Demonstration Project

Control Site 29.56049, -97.03479

Restored Site 29.56049, -97.03479

Seguin Outdoor Learning Center

Urban Riparian and Stream Restoration Demonstration Project
Seguin, Guadalupe County, Texas
Data Analysis:

- Automatic water samplers will be used to collect water quality data.
- Channel dimensions and stream characteristics will be measured prior to revegetation and again during the third year of the project.
- The data will be used to make comparisons between:
  - 1) pre- versus post-revegetation within the zone of revegetation;
  - 2) erosion rates within and adjacent to (upstream and downstream) the revegetated zone; and
  - 3) between the various revegetation sites along the stream.
BEHI and Streambank Erosion

- Data will also be used to assess:
  - the change in the stream bank recession rate,
  - bedload and suspended sediments rate in the stream,
  - the change to the BEHI as a result of the vegetation cover.

- Recommendations will be provided regarding the most effective plant selection and planting techniques for stream bank stabilization in the watershed.
We need to build more support for resource stewardship through education and use an informed public to mitigate, protect and restore our stream systems.
Questions?

Clare Entwistle
Texas Water Resources Institute
Clare.Entwistle@ag.tamu.edu
(210)-277-0292 Ext. 205

Dr. Fouad Jaber
Texas A&M AgriLife Research – Dallas Center
F-jaber@tamu.edu
(972)952-9672