

# STREAM INVESTIGATION, STABILIZATION & DESIGN WORKSHOP

*WITH AN EMPHASIS ON INNOVATIVE APPROACHES TO  
STREAM STABILIZATION AND RESTORATION, INCLUDING  
BIOENGINEERING & REDIRECTIVE METHODS*

*PRESENTED BY*



&



*ASSISTED BY*



**September 18-20, 2018**

*PRESENTED AT*

**Lake Fort Smith State Park**

## **STREAM INVESTIGATION, STABILIZATION & DESIGN WORKSHOP**

**This workshop will introduce the methodologies and procedures for initiating, planning, analyzing, and ultimately designing long-term sustainable river and stream stabilization, or rehabilitation projects. Innovative, environmentally sensitive, and cost-effective approaches to restoration will be discussed. Comprehensive case studies will be presented. Day 2 will include a class trip to a restoration project completed in 2017. And day 3 will include recon of a complex restoration site where the class will be divided into teams to develop conceptual restoration designs. Rain gear, boots, and field clothes are recommended for the field trips.**

### **Instructors**

**Mr. Dave Derrick, Potomologist, Stream Stabilization Specialist, & VP for 20 years with River Research & Design, Inc., Vicksburg, MS. Mr. Derrick retired with 35+ years of experience as a Research Hydraulic Engineer with the Corps of Engineers. Dave has worked in 49 states teaching, designing, & building projects ranging from the Mississippi River to small farm ditches (smaller is harder to design)!!**

**Mr. Ron Redman, Endangered Species Biologist, Stream Surveyor, GIS Specialist, etc. with Mitigation Surveying Services, LLC., Benton AR. Mr. Redman has over 20+ years working with stream stabilization projects, livestock alternative watering, and mitigation. Mr. Redman specialized in designing, building, and monitoring stream and wetland mitigation banks as well as conducting endangered bat surveys.**

**Tim Smith (City of Fort Smith) – Ecologist II specializing in stream ecology and lake ecology with over 20+ years' experience in watershed monitoring programs and protection of public water supplies. Mr. Smith specializes in watershed overview, problems in watersheds, amount of and types of sediment and relation to treatment cost and life of lakes.**

**Aaron Pugh, is a Hydrologist with the U.S. Geological Survey with 30 years of experience working on various fluvial morphology projects across the Country, including geomorphic studies on Ozark and Ouachita streams, and the development of regional hydraulic geometry curves for both the Ouachita and Boston Mountains of Arkansas. Mr. Pugh also developed the state-wide Arc Hydro model that is the basis of the Arkansas-USGS StreamStats map-based web application.**

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### **DIRECTIONS TO THE CLASSROOM:**

From I-49 North take the Chester Exit turning east onto HWY 282. At the Junction of HWY 282 & HWY 71 turn north. Turn east onto HWY 400, look for Lake Fort Smith State Park signs. (34.695366, 94.118797)

### **Nearby Lodging: (rooms not blocked)**

Lake Ft. Smith State Park-1 & 2 bedroom cabins & Lodge-book reservations on line

Sky-View Lodge 800-782-2003

Kingfisher Lodge 479-369-2469

Locke Mountain Cabins 479-369-4006

Deer Hollow Ranch & Cabins 479-369-1211

### **Class Cost & Payment**

The cost of the class is \$500 per person. Box type lunches for all three days and lecture notes will be provided to all participants. Breakfast, dinner, lodging, and transportation are not included. However, continental type foods will be provided before class and during breaks.

Payment is due by Sept 15, 2018; but is not required to register. We understand that the government/corporate reimbursement process can be slowly but a significant part of the class cost is to secure the class facilities, food and other supplies. Early payment will be greatly appreciated. The class size is limited to 40 people, on a first-come-first-serve basis. Once the class is full, a waiting list of interested people, again on a first-come-first serve basis, will be created and used to fill the seats of registered persons who drop out of the class. If you have any questions please contact one of the persons listed below under the heading "Questions and Concerns".

## **Questions or Concerns?**

### *Registration Questions/Other Concerns*

Ron Redman

Ph. 501-249-1712

[RonRedman@mitsurvey.com](mailto:RonRedman@mitsurvey.com)

### *Billing Questions*

Dave Derrick,

Ph. 601-218-7717

[d\\_derrick@r2d-eng.com](mailto:d_derrick@r2d-eng.com)

PayPal; MO, checks; & Visa, Mastercard, Discover, American Express credit cards accepted.

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Lake Fort Smith State Park  
Mountainburg, AR

Date: September 18 - 20, 2018

## Registration Form

**Send completed** form with payment to the *billing address* below and email a copy to [RonRedman@mitsurvey.com](mailto:RonRedman@mitsurvey.com)

### 1. REGISTRATION INFORMATION (Separate form for each registrant)

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY/AGENCY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY/STATE/ZIP \_\_\_\_\_

PHONE \_\_\_\_\_ FAX \_\_\_\_\_

EMAIL \_\_\_\_\_

Profession (for group assignments): \_\_\_\_\_

### 2. FORM OF PAYMENT

Check Enclosed \_\_\_\_\_ Money Order \_\_\_\_\_ **PayPal** \_\_\_\_\_  
Credit cards: Visa \_\_\_\_\_ Mastercard \_\_\_\_\_ Discover \_\_\_\_\_ American Express \_\_\_\_\_ Call  
in credit card info.

**Billing:** River Research and Design, Inc.,  
Dave Derrick  
310 White Wolf Dr.  
Vicksburg, MS. 39183  
Cell: 601-218-7717  
[d\\_derrick@r2d-eng.com](mailto:d_derrick@r2d-eng.com)

**STREAM INVESTIGATION, STABILIZATION & DESIGN WORKSHOP**

**AGENDA**

<b>FT SMITH, AR - DAY 1 - TUESDAY – SEPT 18, 2018</b>	
<b>7:45 – 8:00</b>	<b>SIGN-IN</b>
<b>8:00 – 8:15</b>	<b>WELCOME – INTRODUCTIONS / WORKSHOP OVERVIEW</b>
<b>8:15 – 9:40</b>	<b>DERRICK’S PHILOSOPHY OF RESTORATION-Dave Derrick</b> <ul style="list-style-type: none"><li>• Goals, Objectives, and Function-Based Design</li><li>• Stream Regimes</li><li>• Meandering &amp; How Streams Dissipate Energy</li><li>• Project Planning &amp; Management; Luxuries; Monitoring;</li><li>• Why Stream Projects Fail; Weather</li><li>• Self-Adjusting Bank Stabilization &amp; Grade Control</li><li>• Vines; No-Mow Stones</li></ul>
<b>9:40 – 9:55</b>	<b>BREAK</b>
<b>9:55 – 12:00</b>	<b>Channel Evolution Model (CEM), Headcut Video from Hartman Ditch, &amp; Environmentally Compatible Grade Control – Dave Derrick</b>
<b>12:00 – 1:00</b>	<b>LUNCH</b>
<b>1:00 – 2:45</b>	<b>RESISTIVE &amp; CONTINUOUS BANK STABILIZATION METHODS - Dave Derrick</b> <ul style="list-style-type: none"><li>• Show the Duck Creek Construction Video</li><li>• Longitudinal Peaked Stone Toe Protection (LPSTP)</li><li>• Longitudinal Fill Stone Toe Protection (LFSTP)</li><li>• Keys, Filters, &amp; Stone</li><li>• CASE STUDIES: Duck Creek; Elton Cr.; Red Banks; Grand River @ Rt. A; Missouri River @ Vermillion, SD.</li></ul>
<b>2:45 – 3:00</b>	<b>BREAK</b>
<b>3:00 – 4:20</b>	<b>BIOENGINEERING PHILOSOPHY &amp; PLANTING VEGETATION WITH LARGE YELLOW MACHINES - Dave Derrick</b> <ul style="list-style-type: none"><li>• Harvesting Adventitious Poles</li><li>• Slit Trench Plantings</li><li>• Slit Brush Layering</li><li>• Willow Poles &amp; Willow Curtains</li><li>• Transplants Large &amp; Small</li><li>• Half Drowned Bushes</li><li>• Traffic Control Stones</li></ul>
<b>4:20 – 4:30</b>	<b>WRAP-UP / FIELD INFORMATION FOR TUESDAY</b>
<b>5:30 – 8:30</b>	<b>OPTIONAL COOKOUT DINNER SPONSORED BY THE CITY OF FT. SMITH (Location TBD)</b>

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<b>FT SMITH, AR - DAY 2 - WEDNESDAY – SEPT 19, 2018</b>	
<b>8:00 – 8:10</b>	<b>Meet at Classroom</b>
<b>8:10 – 9:30</b>	<b>REDIRECTIVE METHODS - Dave Derrick</b> <ul style="list-style-type: none"> <li>• Bank Barbs &amp; Rock Vanes</li> <li>• J-Hooks</li> <li>• Bendway Weirs</li> </ul> <b>CASE STUDIES – Little Blue River; Chautauqua Cr.: Neosho River; Catt Cr; Sulphur Cr.</b>
<b>9:30 – 10:30</b>	<b>CASE STUDIES - Dave Derrick</b> <ul style="list-style-type: none"> <li>• Goodwin Creek - Jungle Growth</li> <li>• Haw Creek - Engineered Floodplain Bench</li> <li>• Caz Creek – Bioengineering for a Concrete Lined Channel</li> <li>• Bushkill Cr - Soil-Choked Riprap in a High-energy Stream</li> </ul> <b>Guadalupe River - Willows Planted when it was 103 Degrees</b>
<b>10:30 – 11:00</b>	<b>RECENTLY DEVELOPED INNOVATIVE TECHNIQUES - Dave Derrick</b> <ul style="list-style-type: none"> <li>• Show the 18-Mile Creek Restoration Video &amp; Updated Pix</li> <li>• Do No Harm &amp; Dead Things Are Good Things</li> <li>• Locked Logs</li> <li>• Living Dikes/Dead Dikes</li> <li>• Hydraulic Cover Stones</li> </ul>
<b>11:00 – 11:45</b>	<b>INTRODUCTION TO THE FROG BAYOU PROJECT FIELD SITE, FUNCTION BASED GOALS, &amp; CONSTRUCTION - Ron Redman</b>  <b>Sediment? Where it comes from and Why we Care - Tim White</b>
<b>11:45 – 12:45</b>	<b>LUNCH - @ ???</b>
<b>12:45 – 4:00</b>	<b>FIELD TRIP – Frog Bayou Stream &amp; Sediment Stabilization project. Built Sept 2017 for the City of Ft. Smith</b>
<b>4:00 – 4:30</b>	<b>Travel back to classroom, questions, and wrap up!</b>

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**FT SMITH, AR - DAY 3 - THURSDAY – SEPT 20, 2018**

<b>8:00 – 9:30</b>	<b>REGIONAL HYDRAULIC GEOMETRY CURVE DEVELOPMENT &amp; INTRODUCTION TO THE USGS STREAMSTATS MAP-BASED WEB APPLICATION - Arron Pugh</b>
<b>9:30 – 9:45</b>	<b>BREAK</b>
<b>9:45 – 10:15</b>	<b>INTRODUCTION, INFORMATION, &amp; DESIGN GOALS FOR THE PROPOSED PROJECT FIELD SITE – Ron Redman</b>
<b>10:15 – 12:00</b>	<b>FIELD TRIP – Frog Bayou Proposed Project for the City of Ft. Smith. Class will be divided into teams and will investigate &amp; come up with a concept design for the field site</b>
<b>12:00 – 1:00</b>	<b>LUNCH on the stream</b>
<b>1:00 – 2:45</b>	<b>FIELD TRIP (continued) – Frog Bayou Proposed Project</b>
<b>2:45 – 3:00</b>	<b>Return to classroom</b>
<b>3:00 – 4:00</b>	<b>Teams will present concept designs</b>
<b>4:00 – 4:15</b>	<b>FINAL QUESTIONS, COURSE WRAP-UP &amp; TEARFUL GOODBYS</b>