nc stream restoration institute

NC STATE UNIVERSITY

COLLEGE OF AGRICULTURE & LIFE SCIENCES
ACADEMICS • RESEARCH • EXTENSION

October 2-5, 2006
Westin Hotel Charlotte

Stream Restoration in the Southeast: Accomplishments and Opportunities

CONFERENCE AGENDA

Monday, October 2
1:00pm - 5:00pm

Concurrent Pre-Conference Workshop #1
Evaluating Stream Restoration Success

Government bodies and community groups pursue stream restoration to improve water quality and habitat and to mitigate for stream impacts associated with development. After several years of project implementation, funding agencies have realized the need to ensure that the designed projects are performing the intended functions. As a result, agencies and stakeholders are now working to develop stream restoration success criteria and effective monitoring. This four-hour pre-conference workshop will feature presentations and an open panel discussion on methods of measuring stream restoration project success proposed and implemented in North Carolina and around the country. Morphologic, benthic and vegetative success data collection and analysis will be presented and discussed. New approaches for defining and funding projects to include multiple measurable outcomes will be outlined. Integration of functional measures into restoration assessments in urban, agriculture and mining sites will also be introduced. How well these criteria work "on the ground" and their potential utility for practitioners will be discussed.

1:00-1:10	Welcome & Introduction
1:10-2:00	*Todd Reeve*, Bonneville Environmental Foundation, "Building Science, Accountability, and Measures of Ecological Function into Pacific Northwest Watershed Restoration: Can a long-term and monitoring-intensive Approach Facilitate Effective and Accountable Restoration?"
2:00-2:45	*Jeff Jack*, University of Louisville, "Functional Assessments of Stream Restoration: Current Results and Future Prospects"
2:45-3:15	Break
3:15-4:00	*Dave Penrose*, NC State University, "A "Rapid" Restoration Evaluation Protocol for NC Streams"
4:00-5:00	Panel Discussion

About the Workshop Speakers
Todd Reeve is the Watershed Program Director at the Bonneville Environmental Foundation. For over 10-years, Mr. Reeve has undertaken watershed restoration and fisheries research and assessment efforts across the Pacific Northwest. Mr. Reeve is a former Watershed Restoration Program Manager of a Rogue Basin Watershed Council. Mr. Reeve has represented various federal (U.S.F.S) state (Oregon Department of Fish and Wildlife, Oregon State University), private (Dynamac Corp., Hardin-Davis), and non-profit (Bonneville Environmental Foundation) watershed and fisheries management entities over the past ten years, and he retains extensive experience with monitoring, restoration, and watershed-biological assessment work in aquatic ecosystems of the Pacific Northwest.

Jeffrey Jack is the Wallace Chair of Conservation Biology in the Biology Department at the University of Louisville and a member of the Louisville Stream Institute. He received his Ph.D. from Dartmouth in 1993. His laboratory is interested in the impact of human disturbance on stream ecological integrity and the interdisciplinary use of functional bioindicators and geomorphic measures as indicators of restoration "success." He and his students are also working on identifying the environmental stressors on native unionid mussel assemblages and on the development of protocols for rearing the larval stages of mussels in

the laboratory to re-colonize habitats where mussels have been lost and to help stabilize threatened populations. He has performed and directed research in a number of habitats, including lakes, temporary wetlands, headwater and higher order streams and the Ohio River. He has published on topics such as macroinvertebrate community changes in response to agricultural watershed management, structural and functional responses to restoration projects in urban and mining areas, ecosystem function in large rivers and the effects of river management on drinking water quality.

David Penrose is an Aquatic Biologist and Extension Associate with the Department of Biological and Agricultural Engineering at North Carolina State University. Mr. Penrose is an expert in assessing the biological integrity of streams, in particular the responses to pollution. Mr. Penrose developed the tools that the State of North Carolina uses for its State Biological monitoring program. Prior to joining NCSU, Mr. Penrose worked for the NC Department of Environment and Natural Resources since 1976. Mr. Penrose received his Masters of Public Health from the University of Michigan and a BS in Biology and Chemistry from Northern Michigan University.

Concurrent Pre-Conference Workshop #2:
Sediment Transport in Natural Streams - *Dr. Peter Wilcock*, Johns Hopkins University

This one-half day short course examines sediment transport processes and prediction and their application to stream channel design. We will consider the problem of accurately estimating transport rates, including empirical and theoretical approaches, sources of error, and methods for working with uncertainty. We then evaluate the appropriate application of hydraulic and sediment transport principles to different kinds of channel design problems, including the question of when and where we even need to worry about sediment transport. Previous experience with sediment transport modeling is not required, although some experience with flow and transport in stream channels will be useful. A variety of open-source software tools will be introduced and distributed.

About the Workshop Speaker
Peter Wilcock is Professor in the Department of Geography & Environmental Engineering at the Johns Hopkins University and Director of the Stream Restoration Project at the National Center for Earth-surface Dynamics. His research and teaching focus is on erosion and sedimentation processes and their role in stream restoration and river management.

7:00pm - Please join us for a welcome reception at Aquavina, 435 S. Tryon St., which is within walking distance of the hotel. Appetizers, beverages and mini desserts will be provided.

Tuesday, October 3

7:30 am	**Registration and Continental Breakfast (provided)**
	General Session - Keynote
8:00 am	• Welcome - *Barbara Doll*, NC Sea Grant • Understanding River Processes - *Dr. Richard Hey*, University of East Anglia • Understanding Sediment Transport - *Dr. Peter Wilcock*, John Hopkins University
10:00	**Break**
10:30	• Stream Restoration: A Regulatory Perspective - *Scott McLendon*, US Army Corps of Engineers • Stream Restoration and Research Activities in the Gulf Coastal Plain - *Chris Metcalf*, US Fish & Wildlife Service • Seeing the Watershed for the Streams: Landowners, Partnerships and Implementation of a Restoration Program - *Callie Moore*, Hiwassee River Watershed Coalition
12:00	**Lunch (provided)**
12:30-12:50	Luncheon Presentation: Waters of Mecklenburg - *Rusty Rozzelle*, Mecklenburg County Water Program

Concurrent Sessions - 1:00 pm - 3:00 pm		
Session A Stream Design	Session B Restoration Programs	Session C Riparian Vegetation
A Cost-Based Risk Assessment Method for Selecting Stream Restoration Design Alternatives - *Sue Niezgoda*, University of Wyoming	Strategic Partnerships: Balancing the Concerns of Stakeholders and Regulatory Requirements to Achieve Flood Reduction and Aquatic Ecosystem Restoration - *Robert Bailey*, Tennessee Stream Mitigation Program	An Overview of the Ecosystem Enhancement Program's Recent Advancements and Goals Regarding the Establishment, Monitoring and Maintenance of Vegetation - *Steven D. Roberts*, NC Ecosystem Enhancement Program
Applying Design Failure Modes and Effects Analysis and Risk Quantification to a Stream Restoration Project in the North Carolina Piedmont - *Louise Slate*, Lochner	The Emergency Watershed Protection Program Response to Hurricanes Frances and Ivan in Western North Carolina - *Michael J. Hinton*, USDA Natural Resources Conservation Service	Why Plant Physiology Matters - *Jennifer Cure*, Cure Nursery
The Benefits and Future of Three Dimensional Design of Stream Channels - *Dave Bidelspach*, Stantec	Buyout and Beyond: Reclaiming an Urban Floodplain. Little Sugar Creek Environmental Restoration and Greenway Project, Charlotte, NC - *Andrew Bick*, Buck Engineering, A Unit of Michael Baker Corporation	The effect of soil organic matter amendments on a restored stream and floodplain wetlands in the headwaters of Little Sugar Creek, Charlotte, NC - *James W. Pahl*, Duke University Wetland Center
Coastal Plain Stream Design - *Kris Bass*, NC State University	FEMA Compliance: Integrating Floodplain Regulations and Stream Restoration Projects - *Salam Murtada*, NC Ecosystem Enhancement Program, *John Gerber*, NC Floodplain Mapping Program - Div. of Emergency Management	Riparian Areas Restoration (that satisfies humans too) - *Jon Calabria*, MLA Candidate, NC State University, Daniel J. Nadenicek, Clemson University
Application of the Klingeman Planning Approach to Urban Stream Restoration in the Eastern Piedmont Geologic Province - *Alan Schlindwein*, FSMS Engineers	Estimation and Analysis of Expenses of EEP-Administered Stream Restoration Projects in North Carolina - *Scott R. Templeton*, Clemson University	The effect of riparian vegetation and stream morphology on annual sediment loading - *James M. Halley*, Natural Systems Engineering
Developing Design Criteria for Stream Restoration Projects - *Will Harman*, Buck Engineering, A Unit of Michael Baker Corporation	Construction Costs, Cost Estimating, and Cost Benefit Analyses for Stream and Wetland Restoration Projects; From a Contractors Perspective - *Wes Newell*, Backwater Environmental	Repeated Vegetation Monitoring on North Carolina Restoration Projects - *Lara Rozzell*, NC State University
3:00 pm **Break**		
Concurrent Sessions - 3:20 pm - 5:20 pm		
Session A Design & Assessment Tools	Session B Project Evaluation	Session C Watershed Projects
The Use of the Powersed/Flowsed Model - *George Athanasakes*, FMSM Engineers	A Decision Framework for the Establishment of a Restoration Monitoring Program - *Mac Haupt*, NC DENR Ecosystem Enhancement Program	Watershed Improvement Planning in Gwinnett County, Georgia - *Lori Visone*, Brown and Caldwell
Using MicroStation and GEOPAK Roadway Software for Stream and Wetland Design: Confessions of a Self-Professed Techno-Geek - *Amy Wazenegger*, WAZ Engineering, PC	Outcomes-based watershed restoration in the Deschutes Basin, Oregon: restoring water quality, habitat, and native fish with a long-term and monitoring-intensive strategy - *Todd Reeves*, Bonneville Environmental Foundation	Tools for developing restoration plans of silvopastoral watersheds in East Tennessee - *Jonathan Hagen*, University of Tennessee - Knoxville

Concurrent Sessions 3:20 - 5:20 pm *continued*		
Session A Design & Assessment Tools	Session B Project Evaluation	Session C Watershed Projects
Refraction Seismic Surveying: A Cost Savings for Stream Construction Involving Bedrock? - *Brad Fairley,* Stantec	Sediment and nutrient fluxes following dam removal, *J. Adam Riggsbee,* University of North Carolina, Chapel Hill	Don't Build. Don't Cut. Don't Touch. Please Donate! - *Jennifer Barker,* City of Charlotte, Storm Water Services
Design and Construction of E Stream Types - *Michael Adams*, FMSM Engineers	"I think that worked great" and "What was I thinking" - A case study of elements of 5 implemented projects and how the GOOD, the BAD, and the UGLY from these changed and improved future designs - *Will Wilhelm*, Kimley-Horn and Associates, Inc.	Wetland, stream and riparian buffer protection: one tool for achieving watershed goals - *Stephanie Horton*, NC Ecosystems Enhancement Program
Sediment and Erosion Control for Stream Restoration - *Wyatt Brown*, NC Ecosystem Enhancement Program	Setting river restoration priorities: a review of approaches and a three-step process for identifying and prioritizing restoration actions - *Tim Beechie*, National Oceanic & Atmospheric Administration	Field assessment methods in watershed planning: an analysis of several case studies - *Andrea Leslie*, NC Ecosystem Enhancement Program
An Improved Soil Layering Technique for Streambank Restoration - *Lanka Santha*, RoLanka International, Inc.	Forecasting NC DOT's Transportation Improvement Program Mitigation Needs - *Suzanne Unger*, Buck Engineering, A Unit of Michael Baker Corporation	"From Site to Success" – Using GIS to Support Stream Restoration Efforts - *Andrew Kiley*, Kimley-Horn and Associates
4:00 - 6:00 pm	Job Fair	
5:30 - 7:00 pm	Poster and Exhibit Reception - Grand Ballroom D Exhibit Area	
7:00 pm	Please join us for the Social in Grand Ballroom C and D, Sponsored by ***Buck Engineering, A Unit of Michael Baker Corporation*** and ***River Works, Inc.***	

Wednesday, October 4 (Continental breakfast provided)

Concurrent Sessions - 8:00 - 10:00 am		
Session A Innovative Restoration	Session B Urban projects	Session C Monitoring Results
The Milestone Fen Recharge System - *Richard Gee*, Mongomery County Department of Permitting Services, Rockville, MD	Stream & Wetland Restoration in an Urban Setting - Tarlton Restoration Project - *Richard K. Mogensen*, Mid-Atlantic Mitigation, LLC	An Assessment of Geomorphologic Stability and Performance Utilizing a Simplified Set of Visual Metrics and Display Approaches - *Greg Melia*, NC Ecosystem Enhancement Program
Evolutionary Changes of Constructed Stream Restoration Techniques – The East Fork Case Study - *Scott E. Sonnenberg*, Eco-Design & Engineering, Ltd.	Urban Stream Restoration Challenges and Strategies - *Scott Bell*, Limno-Tech, Inc.	Project evaluation results from the Mitchell River - *Julie Elmore*, Buck Engineering, A Unit of Michael Baker Corporation
Dam Removal for River Restoration: Lowell and Carbonton Dams on the Little and Deep Rivers of North Carolina - *George Howard*, Restoration Systems	Examples of the past and future of integrating natural channel design and stormwater best management practices with land development projects - *Todd St. John*, Kimley-Horn and Associates, Inc.	Stability of Engineered Stream Structures in North Carolina Restoration Projects - *Zackary Mondry*, NC Ecosystem Enhancement Program
Nightingale Storm Water Capital Improvement Project - Stream Restoration and Storm Water Improvements in a Suburban Charlotte Neighborhood - *Dan Rice*, Jordan, Jones & Goulding	The Social Process of Stream Restoration at NCSU: Watching values and perspectives at work in the Rocky Branch, House Creek, and North Creek Decision Processes - *Lucy Laffitte*, NC State University	The C-111 Spreader Canal – Acceler8 the Restoration of South Florida's Creeks and Bays - *Jennifer Heard*, Brown and Caldwell

Concurrent Sessions 8:00 - 10:00 am *continued*		
Session A Innovative Restoration	Session B Urban projects	Session C Monitoring Results
Integrating Mitigation into Land Use Planning - *Michael Ellison*, W.K. Dickson	Looking Beyond the Channel - *Craig Carson*, Montgomery County Dept. of Environmental Protection	Stream Restoration Monitoring in the Hiwassee River Watershed of North Carolina - *Jason Zink*, NC State University
Storm Water Infiltration / Low Impact Development Techniques - *Christopher J. Estes*, Estes Design, Inc.	Balancing Objectives: The Urban Challenge - *Jarrod J. Karl*, Charlotte Storm Water Services	Monitoring: Practical Aspects of Surface Water Data Collection and Station Implementation - *Thomas S. Blue*, Blue: Land, Water, Infrastructure
10:00 am **Break**		
Concurrent Sessions - 10:20 am - 12:00 pm		
Session A Watershed Management	Session B Restoration Case Studies	Session C Research Results
Design Aspects of a Watershed Improvement Project Integrating Stream Restoration and Stormwater Treatment through Channel Reconstruction and an Off-line Wet Pond - *Joel Tillery*, CH2M Hill	Rocky Branch Phase II Restoration - *Barbara Doll*, NC Sea Grant	Rock Cross Vanes: Effects of Design Geometry on Velocity Distribution and Contraction of Flow and a Fault Tree Analyses - *Paige Rollins Puckett* - NC State University
Stoney Creek Local Watershed Plan – Phase IV Implementation Working with Private Landowners to initiate Restoration Projects - *Michael Schlegel*, KCI Technologies, Inc.	A Case Study of Stream Restoration and Site Remediation at Two Former Farm Pond Sites: Neuse River Waste Water Treatment Plant, Raleigh, N.C. - *Peter M. Thibodeau*, ENSR Consulting and Engineering (NC) Inc.	Effective Discharge for a Restored Stream in the Coastal Plain - *Nick Lindow*, NC State University
The Emergency Watershed Protection Program Implemented in Avery County, NC - *Shawn Wilkerson*, Buck Engineering, A Unit of Michael Baker Corp.	Privateer Farms Stream and Wetland Restoration Project – A Case Study for Coastal Plain Restoration - *Kevin Tweedy*, Buck Engineering, A Unit of Michael Baker Corporation	Predicting Erosion Rates of Cohesive Riverbanks - *Jason P. Julian*, University of North Carolina
Watershed Improvements: Easier to Plan than to Implement - *Jill Davenport*, CH2M Hill	Assessment of stream restorations following Mountain Top Removal/Valley Fill mining operations in Kentucky - *Jeff Jack*, University of Louisville	Physical Stability and Macroinvertebrate Community Response to Priority II Stream Restoration - *Rockie English,* Clemson University, Dept. of Forestry and Natural Resources
Montgomery County Stream Restoration Program - Lessons Learned - *Daniel Harper*, Montgomery County Maryland Department of Environmental Protection	Contractor's Perspective - *Darrell Westmoreland*, North State Environmental	Restoration of Hydrologic and Biogeochemical Functions in a Piedmont Bottomland Hardwood - *Curtis J. Richardson*, Duke University Wetland Center
12:00 pm **Lunch** (Provided)		
General Session - 1:00 - 5:00 pm		
• Little Sugar Creek Initiative: Uncovering and Restoring Charlotte's Crown Jewel - *Tim Trautman*, Mecklenburg County		
• Lessons Learned in the Mitchell River Watershed - *Dick Everhart*, USDA-NRCS		
• Evaluating Restoration Effectiveness - Lessons from a National Synthesis, *Dr. Emily Bernhardt*, Duke University		

General Session *continued*
2:30pm **Break**
• Research Needs in Watershed Restoration - *Greg Jennings*, NC State University • The North Carolina Ecosystem Enhancement Program: Strategic Delivery of Compensatory Mitigation; Using Mitigation Requirements to Accomplish Watershed Objectives; Accomplishments & Opportunities - *Suzanne Klimek*, NC Ecosystem Enhancement Program
5:00 pm **Adjourn**

Thursday, October 5

8:00 am - 2:30 pm **Fieldtrip - Breakfast to go and boxed lunch provided (breakfast at 7am, buses start boarding at 7:45am)**
This tour will introduce you to four restoration sites in the metro Charlotte area, all in highly urbanized watersheds of various sizes with different design and construction firms. Each project varies in scope and magnitude depending on site conditions. A variety of funding sources came together to make each of these projects possible. The sites include: Little Sugar Creek-Hidden Valley (completed 2004) Edwards Branch (completed 2004) Little Sugar Creek-Freedom Park (completed 2003) Little Sugar Creek-Westfield Road (completed 2004) Issues including stormwater, utility constraints, park environment, residential neighborhood and heavy use conditions will be discussed. Representatives from the City of Charlotte, Mecklenburg County and the stream restoration designers will be on-site to discuss design parameters, landowner concerns and lessons learned. Participants will be able to ask planning, design and construction questions. Lunch will be provided for participants to enjoy in Freedom Park.