



**US Army Corps  
of Engineers**  
Omaha District

**WORKSHOP ON RESTORATION OF  
STREAMS & RIPARIAN AREAS FOR  
WATER QUALITY AND  
ECOLOGICAL FUNCTIONS**

**July 27-29, 2011**

**U.S. Army Engineer Research and Development Center,  
Environmental Laboratory  
Coastal and Hydraulics Laboratory**

**U.S. Army Corps of Engineers Omaha District**

**Papio-Missouri River NRD  
and the  
Douglas County Extension Service**

**Objectives:** To conduct a tutorial workshop on restoration and management of streams and associated riparian areas to prevent non-point source pollution such as eroded sediments in streams, rivers, and reservoirs; and consideration for methods that provide for a broad range of physical and ecological functions, including water quality improvement, flood storage capacity, habitat and movement corridors, and aesthetics. This workshop will also introduce the methodologies and procedures for initiating, planning, analyzing, and ultimately designing long-term sustainable river and stream stabilization or restoration projects. Innovative, environmentally sensitive, and cost-effective approaches to restoration will be discussed. Comprehensive case studies will be presented.

# RESTORATION OF STREAMS & RIPARIAN AREAS WORKSHOP

**Workshop Sponsors:** U.S. Army Corps of Engineers Water Operations Technical Support (WOTS) Program and the U.S. Army Engineer District, Omaha. Papio-Missouri River NRD, and the Douglas County Extension Service

**Instructors:** Dr. Rich Fischer, Research Biologist, ERDC-Environmental Laboratory; and Dave Derrick, Research Hydraulic Engineer with the Corps of Engineer's Engineering Research and Development Center's Coastal & Hydraulics Laboratory (ERDC-CHL).

## Classroom:

We will meet the first two days at the [Douglas County Extension Svc](#) . The mornings of Thursday July 28 and Friday 29 July will be spent in the field. Additional information on meeting time/place for departure will be provided during the workshop. Rain gear, boots, and field clothes are recommended for the field trips. Busses will be provided. We will return by noon both days.

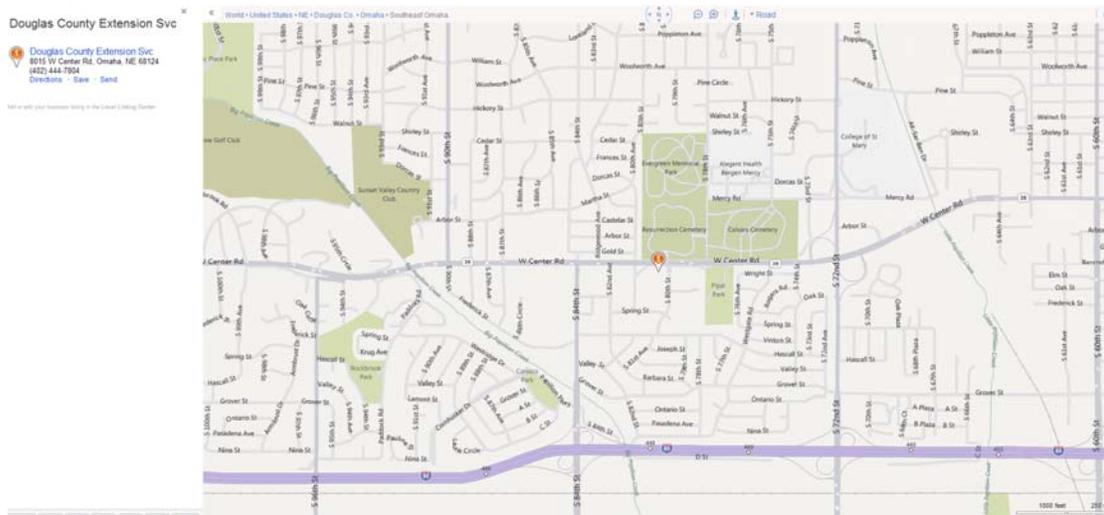
## 1. From I-80

-  Take exit 448, 84<sup>th</sup> Street North 0.4 mi
-  Turn right onto W Center Rd 0.2 mi
-  Turn right onto S 80th Ave, and then immediately turn left onto W Center Rd 0.1 mi
- Arrive at 8015 W Center Rd, Omaha, NE 68124 on the right The last intersection is S 80th Ave If you reach S 80th St, you've gone too far

## [Douglas County Extension Svc](#)

8015 W Center Rd, Omaha, NE 68124

(402) 444-7804



# RESTORATION OF STREAMS & RIPARIAN AREAS WORKSHOP

**Class Notes:** All word slides will be available on an FTP site for downloading and printing. Directions to the FTP site will be provided to all registered attendees two weeks prior to the class. Lectures can be found at the following ftp site:

<ftp://chlquest:3bit5map@134.164.34.99:21/DERRICK-LECTURES>

**REGISTRATION      Register Early! Space is limited!**

## Registration Form

Name: \_\_\_\_\_

E-Mail \_\_\_\_\_

Agency/Affiliation \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Submit Registration via e-mail to [Brenda.G.Shafer@USACE.ARMY.MIL](mailto:Brenda.G.Shafer@USACE.ARMY.MIL)

**Questions? Please call David LaGrone @ 402-995-2453**

### HOTELS –

There are many near the meeting site at the new AKSARBEN VILLAGE and along 72nd Street. A few are listed below.

Holiday Inn Omaha Convention Center 3321 S 72nd St, Omaha, NE (402) 393-3950	Homewood Suites Omaha 7010 Hascall St, Omaha, NE (402) 397-7500
Residence Inn by Marriott Omaha Central 6990 Dodge St, Omaha, NE (402) 553-8898	Courtyard Marriot Aksarben Village 1625 S 67th St, Omaha, NE (402) 951-4300
CoCo Key Water Resort Omaha 3321 S 72nd St, Omaha, NE (402) 393-3950	

## RESTORATION OF STREAMS & RIPARIAN AREAS WORKSHOP

<b>OMAHA - DAY 1 - WEDNESDAY - JULY 27, 2011</b>	
<b>7:45 – 8:15</b>	<b>Sign-in</b>
<b>8:15 – 8:30</b>	<b>Welcome – Student and Teacher Introductions; Orientation, Housekeeping, &amp; Workshop Objectives – Fischer &amp; Derrick</b>
<b>8:30 – 9:45</b>	<b>Philosophy of Restoration – Derrick</b> <ul style="list-style-type: none"><li>• Goal and Function Based Design</li><li>• Project Planning</li><li>• Monitoring</li><li>• How Streams Dissipate Energy</li><li>• Self-Adjusting Bank &amp; Grade Stabilization</li></ul>
<b>9:45 – 10:00</b>	<b>BREAK</b>
<b>10:00 – 11:00</b>	<b>Importance of Stream and Riparian Corridors, Riparian Area Impacts, Issues, and Current Status – Fischer</b>
<b>11:00 – 12:00</b>	<b>Identifying the Ecological Functions of Buffer Strips— Importance to Birds, Mammals, and Herpetofauna - Fischer</b>
<b>12:00 – 1:00</b>	<b>LUNCH</b>
<b>1:00 – 3:00</b>	<b>Channel Evolution Model (CEM) &amp; Environmentally Compatible Grade Control – Includes Vegetation &amp; Fish Passage - Derrick</b>
<b>3:00 – 3:15</b>	<b>BREAK</b>
<b>3:15 – 4:00</b>	<b>Riparian Buffer Strips and Corridors - Importance, Types, Designs, How they Function– Fischer</b>
<b>4:00 - 4:30</b>	<b>Growing Riparian Vegetation in Arid and Semi-arid Environments- Using hydrophilic soil amendments where irrigation is difficult – Fischer</b>
<b>4:30 – 4:40</b>	<b>Wrap-up / Field Information for Thursday &amp; Friday</b>
<b>5:30 – 8:30</b>	<b>Optional Dinner / Ice-breaker (Location TBD)</b>

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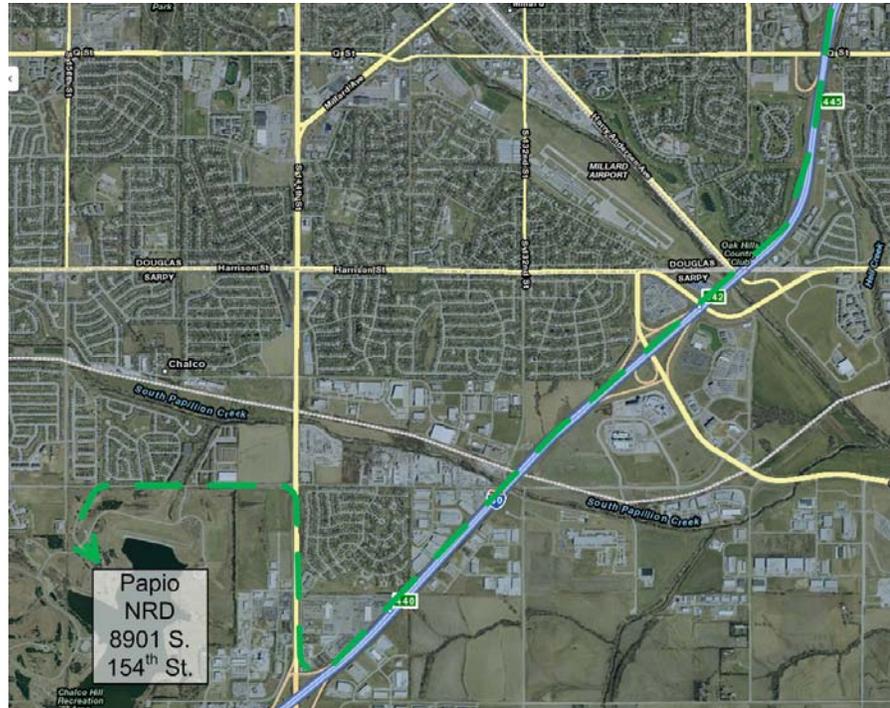
OMAHA - DAY 2 - THURSDAY – JULY 28, 2011	
8:30	<b>Meet &amp; leave from Classroom</b>
8:30 – 10:30	<b>Field Trip –Glacier Creek restoration site N 144<sup>th</sup> and State St.</b> 
10:30 – 12:00	<b>Field Trip – Elkhorn River erosion site</b>
12:00 – 1:00	<b>LUNCH - @ On Your OWN</b>
1:00 – 2:30	<b>Riparian Area Management – Prescribing Designs of Buffer Strips and Corridors for Multiple Functions – Fischer</b>
2:30 – 3:00	<b>Riparian Ecosystem Restoration Opportunities- Programs, Actions, and Case Studies involving buffer strips- Fischer</b>
3:00 – 3:15	<b>BREAK</b>
3:15 – 4:15	<b>Bioengineering Philosophy &amp; Planting Veg with Large Yellow Machines - Derrick</b> <ul style="list-style-type: none"> <li>• Harvesting Adventitious Poles</li> <li>• Slit Trench &amp; Slit Brush Layering</li> <li>• Willow Poles &amp; Willow Curtains</li> <li>• Transplants</li> <li>• Half Drowned Bushes</li> </ul> <b>Traffic Control Stones</b>
4:15 – 4:30	<b>Project Construction – Derrick</b>

# RESTORATION OF STREAMS & RIPARIAN AREAS WORKSHOP

## OMAHA - DAY 3 - FRIDAY - JULY 29, 2011

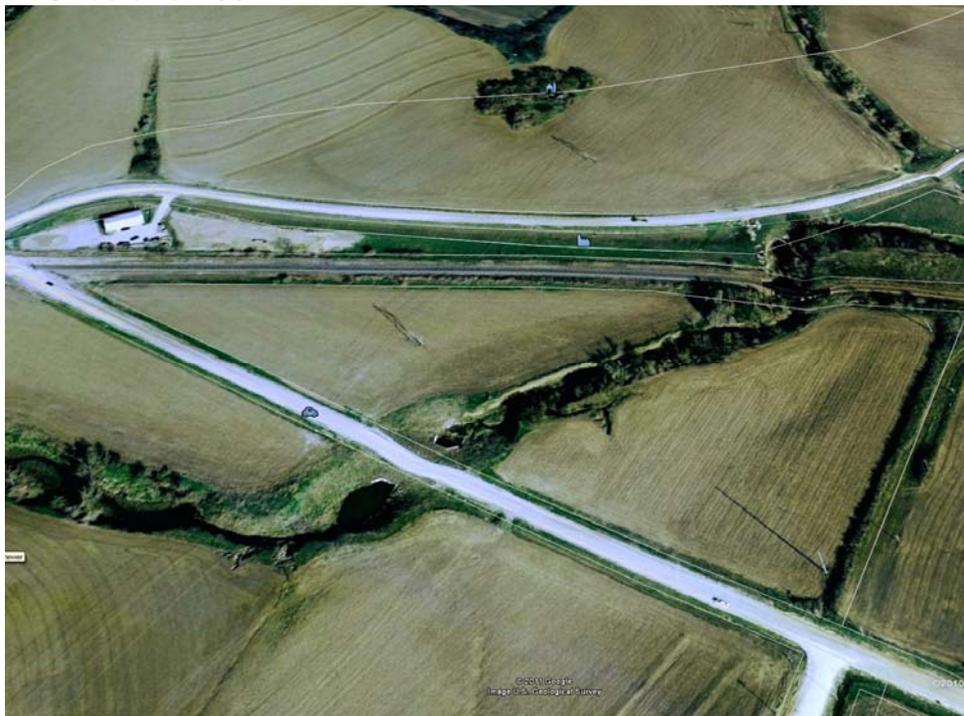
8:30

Meet at the Papio-Missouri River NRD Building to load on the bus.  
8901 S 154<sup>th</sup> Street



8:30 – 10:00

Field Trip – Incised Channel site  
Incised channel bank stability site  
at Giles and 180<sup>th</sup>



## RESTORATION OF STREAMS & RIPARIAN AREAS WORKSHOP

<p><b>10:00 – 12:00</b></p>	<p><b>Field Trip – Elkhorn River erosion site south of Q Street</b></p> 
<p><b>12:00 – 1:00</b></p>	<p><b>LUNCH - BBQ or on your own</b></p>
<p><b>1:00 – 2:15</b></p>	<p><b>Resistive &amp; Continuous Bank Stabilization Methods - Derrick</b></p> <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, Stone,</li> <li>• Case Studies – Red Banks; Grand River @ Rt. A; Duck Creek; Elton Cr.; Missouri River @ Vermillion, SD.</li> </ul>
<p><b>2:15 – 2:30</b></p>	<p><b>BREAK</b></p>
<p><b>2:30 - 3:15</b></p>	<p><b>Innovative Techniques - Derrick</b></p> <ul style="list-style-type: none"> <li>• Show the 18-Mile Creek Restoration Video</li> <li>• Locked Logs</li> <li>• Living Dikes</li> <li>• Planting on a Grid</li> <li>• Hydraulic Cover Stones</li> <li>• Building Pools</li> </ul>
<p><b>3:15 – 4:00</b></p>	<p><b>CASE STUDIES – Derrick</b></p> <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> </ul>

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	<ul style="list-style-type: none"><li>• Bushkill Cr - Soil-Choked Riprap in a high-energy stream</li><li>• Guadalupe River - Willows Planted when it was 103 degrees</li></ul>
4:00 - 4:30	<b>Redirective Methods -Derrick</b> <ul style="list-style-type: none"><li>• Rock Vanes</li><li>• J-Hooks</li><li>• Bendway Weirs</li><li>• Case Studies – Little Blue River; Chautauqua Cr.: Neosho River; Catt Cr; Sulphur Cr.;</li></ul>
4:30 – 4:40	<b>Course Wrap-Up</b>