# River Restoration: Practices and Concepts

# Dam Removal Project Management Training: Streamlining the Dam Removal Process

United States Army Corps of Chicago District 231 S. LaSalle St. Chicago, Illinois 60604

March 11, 2014

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# **WELCOME**

On behalf of the conference sponsors and supporting organizations and committees, welcome to today's River Restoration: Practices and Concepts Workshop. The workshop in the latest practices for stream restoration was inspired by the surge in dam removals that are taking place in Illinois. It is the goal of the Steering Committee that participants gain an understanding of the many factors involved that contribute to the dam removal process.

This one day workshop is designed for engineers, biologists, resource managers, and policy makers interested in this rapidly expanding area of river and stream restoration. The workshop will focus on issues involving project identification and implementation as well as engineering requirements and pitfalls that may occur during a project's timeline. Another goal of this workshop is to examine the regulatory issues associated with a removal and in particular those issues relating to sediment management. Specifically, we plan to address issues relating to the dam removal from the beginning of the process to the end in the Midwest Region of the country.

Many people donated their time to make this workshop a success. A special thanks goes out to the Illinois Department of Natural Resources, the United States Army Corps of Engineers, Chicago District, American Rivers, Inter-Fluve and the Illinois-Indiana Sea Grant College Program for their support.

Please take a moment to fill out the Evaluation Forms for the conference. Your comments will guide the steering committee in selecting future river restoration workshops.

Thank you for participating in this workshop. By applying the knowledge gained here today, we well have a positive impact on the future of stream restoration.

Sincerely,

River Restoration Steering Committee

## River Restoration: Practices and Concepts Series 2014 Agenda

Date and Time	<b>Topic/Session</b>

Tuesday, March 11th

8:00 a.m. Registration: Continental Breakfast

8:30 a.m. Welcome. Colonel Frederic Drummond, USACE, Chicago District Commander

8:40 a.m. Introduction. Steve Pescitelli, Illinois Department of Natural Resources,

Division of Fisheries

8:50 a.m. *Illinois Perspective on Dam Removal.* Arlan Juhl, Director, Office of Water

Resources Illinois Department of Natural Resources

9:10 a.m. National Perspective: Dam Removal Project Overview. Brian Graber, Senior

Director, River Restoration, American Rivers

10:10 a.m. **BREAK** 

10:30 a.m. Ecological Perspective - Update of Chicago Region Projects and Ecological

Benefits. Steve Pescitelli, Illinois Department of Natural Resources; Division of

Fisheries, Streams Specialist

11:00 a.m. Dam Removal Process - National Experiences in Scoping, Design, and

Implementation. Brian Graber, Senior Director, River Restoration, American

Rivers

12:30 p.m. LUNCH ON YOUR OWN

1:30 p.m. Engineering Perspective - Midwest Case studies. Andy Selle, Inter-Fluve Inc.

2:15 p.m. Engineering Perspective - Northeastern IL case studies. John Wills, Wills,

Burke, Kelsey Associates

3:00 p.m. *BREAK* 

3:15 p.m. Regulatory Perspective - General Permitting. Kathy Chernich, USACE,

Chicago District

3:35 p.m. Regulatory Perspective- Water Quality. Darren Gove, Illinois EPA

4:00 p.m. Regulatory Perspective - Floodways/Dam Safety. Bill Boyd, Illinois

Department of Natural Resources, Office of Water Resources

4:20 to 5:00 p.m. Panel Discussion - Dam removal permitting process, USACE, IEPA,

**IDNR** 

# River Restoration: Practices and Concepts

# Dam Removal Project Management Training: Streamlining the Dam Removal Process

# March 11, 2014

# **Workshop Evaluation**

How did you hear	
about the	
workshop?	Newsletter
Workshop.	Website
	Word of mouth
	Email or listserv announcement
	Other
What type of	
organization are	
you affiliated	Natural Resource Department
with?	Consultant
With	Park Department
	Engineers
	City Planner
	Academia or student
	Other- Please describe if necessary
	,

Please rate the	(Please circle one)		
conference on the			
following items:			
	Overall quality of presentations: excellent good adequate poor		
	Workshop handouts: excellent good adequate poor		
	Audio-visual logistics: excellent good adequate poor		
	Breaks: excellent good adequate poor		
	Conference location, facilities: excellent good adequate poor		
	Overall conference: excellent good adequate poor		
Which			
presentation(s)			
did you find most useful and why?			
userur and writer			
What two areas			
would you like to			
see covered in a future workshop?			
(this will help us			
plan for the			
future)			
Have you	☐ Stream Restoration, June 12-13, 2001 at Elgin Community College,		
attended previous	Elgin, IL		
River Restoration	□ Dam Removal, April 18, 2002 at Purdue University Calumet,		
Series	Hammond, IN  Beyond the Basics of Dam Removal and Modification, June 4, 2003,		
Workshops?	Elgin Community College, Elgin, IL		
	☐ Riparian Bioengineering and Restoration Techniques, July 14-15,		
	2004, Illinois Institute of Technology, Wheaton, IL  Restoring Stream Fisheries with Meander Pools, Riffles and		
	Fishways, September 28 <sup>th</sup> and 29 <sup>th</sup> , 2005.		
	☐ Fish Passage on Midwestern Streams: Evaluation of Stability and		
	Functionality of Dam Removals, Constructed Fishways and Culvert		
	Crossings, November 7 and 8, 2007.  Implementation, and Analysis of Studies to Evaluate Instream		
	Restoration Practices, December 2009.		
	□ NA		

If yes, have you used the information presented in past workshops in your profession?	<ul> <li>At work</li> <li>Communicating to the public</li> <li>Consulting other organizations</li> <li>Education within your own organization</li> <li>Educating local officials</li> <li>Other – Please explain:</li> </ul>
How do you plan on using the information from today's workshop?	<ul> <li>At work</li> <li>Communicating to the public</li> <li>Consulting other organizations</li> <li>Education within your own organization</li> <li>Educating local officials</li> <li>Other – Please explain:</li> </ul>

Please complete this survey and return it to the registration desk before you leave. If you are unable to turn in this survey the day of the conference, please send it to Leslie Dorworth, Illinois-Indiana Sea Grant College Program, College of Engineering, Mathematics, and Science, Purdue University Calumet, Hammond, IN 46323-2094, fax (219) 989-2184 or as a pdf to dorworth@purduecal.edu.

Thank you for taking a few moments to fill out this survey to better serve you at future workshops.

Thank you to all of the steering committee members who worked to organize this workshop:

Steve Pescitelli, Illinois Department of Natural Resources, Division of Fisheries Frank Veraldi, USACE, Chicago District
Brian Graber, American Rivers, Senior Director, River Restoration
Leslie Dorworth, Illinois-Indiana Sea Grant College Program
Andy Selle, Inter-Fluve

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March 11, 2014

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Arlan Juhl is a graduate of Iowa State University with a Bachelor of Science degree in Agricultural Engineering. He has been employed by the Office of Water Resources since 1973 and has worked on watershed planning, flood relief projects, public safety at dams, dam removals, water supply planning, and recreational usage design.

Mr. Juhl has held numerous positions in the Office of Water Resources, including hydraulic engineer, squad leader, section manager, division manager, and now Office Director. He is the recipient of the John Wesley Powell Award from the U. S. Geological Survey for work in support of data collection. He is a registered professional engineer in Illinois.

Mr. Juhl will present the state of Illinois perspective on dam removals.

# Stephen M. Pescitelli

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**Education:** B.S. Biology, 1978, University of Illinois at Urbana - Champaign.

M.S. Biology, 1982, University of Illinois at Urbana - Champaign.

Current Position: Stream Specialist, Illinois Department of Natural Resources.

Length of time at current position: Since July 1994.

**Area of Responsibility:** Northeastern Illinois: Fox River, Des Plaines River, DuPage River, Kankakee River, Chicago River, Mazon River, and AuSable Creek.

**Job Responsibilities:** Monitoring fish communities, management of sport fisheries, permit review, watershed planning, habitat and stream restoration, outreach and education.

**Professional Interests:** Factors affecting fish community structure in rivers and streams; distribution and life history of stream fishes; fragmentation in aquatic systems, fish passage/dam removal, stream preservation and restoration.

## Title: Evaluation of Fish Community Response to Dam Removal in Northeastern Illinois

#### Stephen Pescitelli

Illinois Department of Natural Resources, Division of Fisheries 5931 Fox River Drive Plano, Il 60548 steve.pescitelli@illinois.gov

Since 1998 a total of 20 dam removals and 4 fish passage projects have been completed in Northeastern Illinois. Examples of fish community response to barrier removal and habitat restoration will be discussed at four of the removal project locations. A multiple dam removal was completed in 2006 on Brewster Creek. The phased removal allowed natural channel formation; no downstream sedimentation effects were observed. Smallmouth bass and quillback were early migrants into the new channel. In total, 14 new species have been found including channel catfish, flathead catfish, minnows, and darters. Eight new species were found upstream after removal of a dam on Ferson Creek. The Blackberry Creek dam, removed in 2013 allowed migration of 25 new species in the former dam pool. Riverine suckers spawned in the new channel weeks after removal; smallmouth bass and channel catfish young-of-the-year were documented 4 miles upstream in the first season. Shortly after the 2012 removal of a large dam on the Des Plaines River, the former pooled area held 10 new species with improved IBI. Channel catfish, which were not previously recorded in the upstream segment, occurred at several locations along with several other new migrants. Fish passage projects at three sites have also allowed upstream migration, but these structures have had significant maintenance issues. This confirms experiences in other States which indicate dam removal is a better option, restoring stream habitat and eliminating maintenance.



## **Brian Graber**

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Brian Graber is the Senior Director of American Rivers' River Restoration Program. He leads a team of experts completing projects and advocacy for dam removals, culvert replacements, and floodplain restoration. Brian is a fluvial geomorphologist and water resources engineer and has worked on all aspects of more than 50 completed dam removal projects from restoration design to community outreach. He provides scientific and engineering assistance, identifies funding possibilities, coordinates project managers and diverse project partners, and develops guidance materials for projects to restore natural river function by removing or retrofitting instream barriers such as dams and poorly functioning culverts. He instructs courses and workshops around the country on various aspects of dam removal and has led more than a dozen dam removal project manager trainings around the country.

From 2003 through 2007, Brian was the River Restoration Scientist for the Riverways Program in the Massachusetts Department of Fish & Game. He led the development of the state's Priority Project Program, which works to restore rivers for multiple species through dam removal, stream crossing replacement, daylighting, and instream habitat enhancement. At Riverways, Brian worked extensively with state regulators to develop policy and guidance materials to institutionalize dam removal as a permittable approach to river restoration.

Brian has also worked as a stream restoration consultant, completing hydrologic research and watershed assessments, as well as designing channel restoration and project monitoring at several small dam removals. He was also previously coordinator of Trout Unlimited's Small Dams Program, a national program providing guidance and technical assistance to local volunteer chapters involved in efforts to improve river habitat at small dams.

He has co-authored several publications on various aspects of river restoration and small dam removal including "Dam Removal Success Stories" and has published journal articles on both the ecological impacts of dams and community involvement strategies at restoration projects.

Brian holds Masters degrees in Civil Engineering and Geography, both from the University of Wisconsin-Madison. He obtained his Bachelor's degree in Geography and Mathematics at Dartmouth College.

**Title: Illinois Project Management Training** 

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1) National Perspective: Dam Removal Project Overview

2) Dam Removal Process: National Experiences in Scoping, Design, and Implementation

These two talks will combine to provide an overview of dam removal in United States and a basic understanding of the components of dam removal projects. More than 1,150 dams have been removed around the country, and American Rivers has led a national movement for the past 15 years to grow this effective river restoration technique. The Overview talk will provide a national perspective on dam removal in the United States, including an overview of project approaches; steps to completing a project; what to look for in an initial project reconnaissance; a brief discussion on social issues at projects; and an overview of project costs and funding sources. The Scoping and Design talk will lay out the steps to design a dam removal project, and will provide a preliminary understanding of surveying, hydraulics, sediment management, infrastructure protection, species protection, and construction approaches. The objectives of the talks are to help potential project managers understand the overall process of removing a dam and be able to scope out the steps necessary to complete a project.

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Andy has a BS in Fisheries and Aquatic Science and an MS in Hydraulic Engineering, both from Purdue University. He worked for several years as a stream biologist in Indiana with the Indiana Department of Environmental Management before returning to Purdue to pursue studies in fluvial geomorphology, hydraulics, and hydrology. A biologist by choice and engineer out of necessity, Andy has worked in streams over the last 14 years, the last 10 with Inter-Fluve, a stream restoration firm. His mixed background allows him to "speak" a number of languages that develop among stakeholders on stream projects. To date Andy has worked on over 30 dams from feasibility to removal, ranging in size from a few feet to over 40 feet.

## TITLE: Dam Removal in the Midwest - Small to Large Case Studies

Andy Selle, P.E. Fisheries/Civil Engineer EIT Inter-Fluve, Inc., 301 S. Livingston St. Suite 200 Madison,WI 53703 aselle@interfluve.com

Streams and their associated dams within the Midwest differ markedly among the region. This talk will present information integral to field data collection, design, and construction that can serve as a beginning point for those approaching a dam removal project. Specific examples of dam removal projects within Wisconsin, Illinois, and Michigan will be used to illustrate a range of project types and examples of how the process moves forward along sometimes different paths toward the same endpoint.

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John is president of Wills Burks Kelsey Ltd located in Aura, IL. He is a professional engineer in the states of Illinois and Wisconsin. Over the past 25 years, John has been involved in environmental resource related projects.

# Title: 14 years of Dam Removals, a Permitting Odyssey

John J. Willis, PE, CPESC President Wills Burke Kelsey Associates 8 East Galena Boulevard, Suite 402 Aura, IL 60506

This presentation will focus on case studies involving dam removal projects and the interplay that occurs between the goals and objective laid out for the project and the twists and turns of permitting the project may encounter during the lifetime of the project. I will present what I consider to be the evolution of thought on the part of the project sponsors, the engineers and the regulatory community as the project moves forward.

Kathy G. Chernich Regulatory Branch U.S. Army Corps of Engineers 231 S. LaSalle Street Chicago, IL 60604

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Kathy Chernich has 19 years of service with the US army Corps of Engineers, Regulatory Branch. She is currently Chief of the East Section which encompasses Cook County, including the Lake Michigan shoreline, and the County of Lake and DuPage. Kathy Holds Bachelor's Degree in Environmental Management and Biological Science from Elmhurst College.

## **REGIONAL PERMIT PROGRAM**

#### **#5. WETLAND AND STREAM RESTORATION AND ENHANCEMENT**

RP5 authorizes the restoration, creation and enhancement of wetlands and riparian areas, and the restoration and enhancement of rivers, creeks and streams, and open water areas on any public or private land. Wetland and stream restoration and enhancement activities include the removal of accumulated sediments; installation, removal and maintenance of small water control structures, dikes and berms; installation of current deflectors; enhancement, restoration, or creation of riffle and pool structures; placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or create stream meanders; backfilling of artificial channels and drainage ditches; removal of existing drainage structures; construction of open water areas; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation; mechanized land-clearing to remove undesirable vegetation; and other related activities. This RP may be used to relocate aquatic habitat types on the project site, provided there are net gains in aquatic resource functions and values. Authorization under RP5 is subject to the following requirements which shall be addressed in writing and submitted with the notification:

- a. All projects will be processed under Category I.
- b. This permit does not authorize activities to relocate or channelize a linear waterway such as a river, stream, creek, etc.
- c. This permit cannot be used for the conversion of a stream or creek to another aquatic use, such as the creation of an impoundment for waterfowl habitat.
- d. This permit cannot be used to authorize the conversion of natural wetlands to another aquatic use, such as creation of waterfowl impoundments where a forested wetland previously existed, or the conversion of waterfowl impoundments and wildlife habitat areas.
- e. A management and monitoring plan shall be required for the restoration, creation or enhancement of aquatic resources. Upon the District's approval, the management and monitoring plan may be designed to be site specific, with the duration of the plan determined on a case-by-case basis.
- f. For a project site adjacent to a conservation area, forest preserve holdings, or village, city, municipal or county owned lands, the permittee shall request a letter from the organization responsible for management of the area. The response letter should identify recommended measures to protect the area from impacts that may occur as a result of the development. A copy of the request and any response received from the organization shall be submitted to the District with the notification.
- g. For projects receiving State or Federal grants or funding sources, the permittee shall submit a copy of the document disclosing the expiration date for use of the funds and the expected calendar date for commencement of the project in order to meet funding deadlines.

## **REGIONAL PERMIT PROGRAM**

#### **#7. TEMPORARY CONSTRUCTION ACTIVITIES**

RP7 authorizes temporary structures and discharges necessary for construction activities, access fills and dewatering of construction sites. Authorization under RP7 is subject to the following requirements which shall be addressed in writing and submitted with the notification:

- a. All projects will be processed under Category I.
- b. The temporary impact to waters of the U.S. shall not exceed 0.25 acres.
- c. Fill shall be composed of non-erodible materials and be constructed to withstand expected high flows.
- d. Low ground-pressure equipment is recommended for work in wetlands. However, after careful consideration, if the District accepts a proposal to use heavy equipment to accomplish the work, the placement of timber mats or other protective measures shall be utilized to minimize soil disturbance.
- e. All materials used for temporary construction activities shall be moved to an upland area immediately following completion of the construction activity.
- f. The permittee is required to restore the construction area to pre-construction conditions including grading to original contours and revegetating disturbed areas with appropriate native vegetation immediately upon completion of the project. A restoration plan shall be submitted with the notification. A 1-foot contour topographic map of the project area may be required on a case-by-case basis.
- g. This permit does not authorize the use of earthen cofferdams or other practices that would result in a release of sediment into waters of the U.S. Cofferdams shall be constructed of non-erodible materials only. Acceptable practices include, but are not limited to: pre-fabricated rigid cofferdams, sheet piling, inflatable bladders, sandbags and fabric-lined basins.
- h. For projects that require installation and operation of a cofferdam, the cofferdam method and a detailed construction sequence shall be specified in the project narrative, and clearly labeled on the construction plans. Please see our website at www.lrc.usace.army.mil/Portals/36/docs/regulatory/pdf/cofferdam.pdf for "Requirements for In-Stream Construction Activities".
- i. The following requirements will be adhered to for any project requiring in-stream work and shall be incorporated into the soil erosion and sediment control plans for the project:
- 1) Work in the waterway should be timed to take place during low or no-flow conditions. Low flow conditions are at or below the normal water elevation. 26
- 2) Water shall be isolated from the in-stream work area using a cofferdam constructed of non-erodible materials (steel sheets, aqua barriers, rip rap and geotextile liner, etc.). Earthen cofferdams are not permissible.

- 3) The cofferdam must be constructed from the upland area and no equipment may enter the water at any time. If the installation of the cofferdam cannot be completed from shore and access is needed to reach the area to be coffered, other measures, such as the construction of a causeway, will be necessary to ensure that equipment does not enter the water. Once the cofferdam is in place and the isolated area is dewatered, equipment may enter the coffered area to perform the required work.
- 4) If bypass pumping is necessary, the intake hose shall be placed on a stable surface or floated to prevent sediment from entering the hose. The bypass discharge shall be placed on a non-erodible, energy dissipating surface prior to rejoining the stream flow and shall not cause erosion. Filtering of bypass water is not necessary unless the bypass water has become sediment-laden as a result of the current construction activities.
- 5) During dewatering of the coffered work area, all sediment-laden water must be filtered to remove sediment. Possible options for sediment removal include baffle systems, anionic polymers systems, dewatering bags, or other appropriate methods. Water shall have sediment removed prior to being re-introduced to the downstream waterway. A stabilized conveyance from the dewatering device to the waterway must be identified in the plan. Discharge water shall not result in a visually identifiable degradation of water clarity.
- 6) The portion of the side slope that is above the observed water elevation shall be stabilized as specified in the plans prior to accepting flows. The substrate and toe of slope that has been disturbed due to construction activities shall be restored to proposed or pre-construction conditions and fully stabilized prior to accepting flows.

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Darren Gove works for Illinois EPA and will provide us with an overview of his agency's permitting requirements.

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Bill earned a Bachelor of Science Degree in Civil Engineering from the University of Wisconsin Platteville in May of 1988 and his Professional Engineers license in 1995. He has been with the State of Illinois, Office of Water Resources for 25 years. The office has been performing Dam Safety reviews for the past 19 years. During that time he has handled numerous authorizations for work proposed on jurisdictional dams including dam removal projects.

Bill will speak on Dam removal requirements in the Rules for the Construction and Maintenance of Dams.