

Engineering Innovative Fish Passage:

Design of Fish Passage at Dams and Road Crossings

**January 10–12, 2005
Raleigh, North Carolina**

The Design of Nature-like Fishways

**January 12–14, 2005
Raleigh, North Carolina**

By invitation of and in cooperation with American Rivers, North Carolina Department of Environment and Natural Resources, North Carolina Ecosystem Enhancement Program–North Carolina State University, and the U.S. Fish and Wildlife Service



**COLLEGE OF ENGINEERING
UNIVERSITY OF WISCONSIN-MADISON**

**Department of Engineering Professional Development
432 North Lake Street Madison, Wisconsin 53706**

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COLLEGE OF ENGINEERING ■ DEPARTMENT OF ENGINEERING PROFESSIONAL DEVELOPMENT

Two complementary courses emphasizing...

Engineering Innovative Fish Passage:

Design of Fish Passage at Dams and Road Crossings

January 10–12, 2005 in Raleigh, North Carolina

The Design of Nature-like Fishways

January 12–14, 2005 in Raleigh, North Carolina

Earn up to



By invitation of and in cooperation with American Rivers, North Carolina Department of Environment and Natural Resources, North Carolina Ecosystem Enhancement Program–North Carolina State University, and the U.S. Fish and Wildlife Service

Two complementary courses emphasizing...

Engineering Innovative Fish Passage: Design of Fish Passage at Dams and Road Crossings

January 10–12, 2005 in Raleigh, North Carolina

- **Fundamental considerations for design and implementation of fish passage measures**
- **Applicable federal guidance and regulations**
- **Designing pool and weir fishways**
- **Designing vertical slot and roughened channels fish passage**
- **Flow control, sediment and debris, and exits**
- **Culvert design methods, and more**

Engineering Innovative Fish Passage: The Design of Nature-like Fishways

January 12–14, 2005 in Raleigh, North Carolina

- **Ecological, fisheries and engineering perspectives of designing nature-like fish passage**
- **German and European policy and development for river restoration and connectivity**
- **State-of-the-art design of nature-like fish passage in Europe**
- **Successful design processes and approaches**
- **Open channel design workshop**
- **Case studies from the field**

Save \$295 by enrolling in both courses!

See enrollment form.

By invitation of and in cooperation with

American Rivers, North Carolina Department of Environment and Natural Resources, North Carolina Ecosystem Enhancement Program–North Carolina State University, and the U.S. Fish and Wildlife Service

The first of two complementary courses emphasizing...

Engineering Innovative Fish Passage: Design of Fish Passage at Dams and Road Crossings

January 10–12, 2005 in Raleigh, North Carolina

Why This Course

Attend this course and gain both a conceptual framework and practical information about the full range of factors involved with the consideration, design and implementation of fish passage measures. You will learn about the basics of fisheries biology and fish passage systems and how they relate to designing a functional fish passage. You will experience a diversity of perspectives and obtain multidisciplinary insights that will assist you in designing effective, functional fish passage.

Course Objectives

This practical course for professionals working on dams, road culverts and fish passage technologies will provide comprehensive information on bypass channels and traditional fishways. You can expect to

- understand fish behavior and barriers to fish passage
- consider strategic planning and site assessment
- learn about common fishway design components
- increase your knowledge of design and construction approaches

Discussion Highlights

During our interactive, fast-paced class sessions, plan to focus on these and other practical topics:

- applicable federal guidance and regulations
- designing pool and weir fishways
- designing vertical slot and roughened channels fish passage
- designing hybrid fish passage
- flow control, sediment and debris, and exits
- culvert design methods, and more!

Who Will Benefit

This comprehensive course will benefit

- design engineers
- regulatory agency staff
- fisheries managers
- fisheries biologists
- dam owners
- public sector professionals
- ecological consultants
- conservation personnel
- planners

Expert Instructors

Your instructors will share practical insights and knowledge gained from years of experience. Representing a range of agencies and organizations, they will address issues and approaches that will increase your ability to design effective, functional fish passages.

Earn Continuing Education Credits

By participating in this course you will earn 1.8 Continuing Education Units (CEU) or 18 Professional Development Hours (PDH).

Course Planning Committee

Ken Bates

Fishway Consultant

Patrick Eagan

University of Wisconsin–Madison

Stephanie Lindloff

New Hampshire Department of Environmental Services

David Robinson

North Carolina State University, Center for Transportation and the Environment and North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program

Mike Wicker

U.S. Fish and Wildlife Service

Laura Wildman

American Rivers

Course Outline

Monday, January 10

7:30 Registration

Sheraton Raleigh Capital Center Hotel
421 South Salisbury Street
Raleigh, North Carolina

8:00 Welcome and Introduction

Patrick Eagan PhD, PE
Program Director/Associate Professor
Department of Engineering Professional Development
College of Engineering
University of Wisconsin-Madison

8:30 Overview of the Fish Passage Design Process

Ken Bates
Fish Passage and Habitat Restoration Engineer
Olympia, Washington

9:30 Break

9:45 Understanding Fish Behavior and Barriers

- Life history needs
- Ecological needs
- Physical requirements
- Fish energy expenditures
- Migration needs for anadromous fish, resident fish and aquatic species

Stephen Gephard
Fisheries Biologist
Connecticut Department of Environmental Protection
Old Lyme, Connecticut

10:45 Strategic Planning for Fish Passage

- Prioritizing locations
- Targeting species
- Cost-benefit analyses
- Strategic partnerships
- Regulatory vs. voluntary approaches

Stephen Gephard

12:00 Lunch

1:00 Sturgeon Passage

Doug Cooke
Diadromous Fish Project Coordinator
South Carolina Department of Natural Resources
Bonneau, South Carolina

2:00 Applicable Federal Guidance and Regulations

- Section 18 FERC Fishway Prescription

Susan Cielinski
Regional Hydropower Coordinator
U.S. Fish and Wildlife Service
Atlanta, Georgia

2:45 Break

3:00 Common Fishway Design Components

- Useful terms and USFWS standards
- Entrances
- Location
- Hydraulics
- Auxiliary water

Ken Bates
Curt Orvis
Hydraulic Engineer-Team Leader
U.S. Fish and Wildlife Service
Hadley, Massachusetts

4:30 Adjournment

Tuesday, January 11

7:30 Coffee and Conversation

8:00 Designing Pool and Weir Fishways

- Application
- Limitations
- Hydraulics

Ken Bates
Curt Orvis

8:45 Designing Vertical Slot Fish Passage

- Application
- Limitations
- Hydraulics

Ken Bates
Curt Orvis

9:45 Break

10:00 Designing Roughened Channels Fish Passage

- Application
- Limitations
- Hydraulics

Ken Bates
Curt Orvis

11:00 Designing Hybrid Fish Passage

- Application
- Limitations
- Hydraulics

Ken Bates
Curt Orvis

12:00 Lunch

1:00 Flow Control, Sediment and Debris, and Exits

Ken Bates

1:45 Design Exercise

- Pool and weir
- Vertical slot

Ken Bates

2:30 Break

2:45 Culvert Design Methods for Passage of Fish and Aquatic Organisms

Ken Bates

4:30 Adjournment

Wednesday, January 12

7:30 Coffee and Conversation

8:00 Site Assessment for Culvert Design

- Geomorphic and watershed context
- Long profile

Ken Bates

9:15 Break

9:30 Design Methods

- Hydraulic method
- Stream simulation method

Ken Bates

11:00 Monitoring and Evaluation of Fish Passage-Panel

Ken Bates
Stephen Gephard
Dr. Uli Dumont

Principal and Engineering Consultant
Floeksmuehle Consulting
Aachen, Germany

12:00 Lunch on Your Own and Final Adjournment

For Related
Course Descriptions

[http://epdweb.engr.wisc.edu/
catalogs/civil.lasso](http://epdweb.engr.wisc.edu/catalogs/civil.lasso)

The second of two complementary courses emphasizing...

Engineering Innovative Fish Passage: The Design of Nature-like Fishways

January 12–14, 2005 in Raleigh, North Carolina

Why This Course

This **advanced course** assumes that you understand the relevant fish behavior aspects to passage design. You will focus in depth on nature-like fishway design as you examine European experiences, various design perspectives, proven design approaches, and real-world case studies.

An excellent precursor to this course is *Design of Fish Passage at Dams and Road Crossings*, which immediately precedes this course.

Course Objectives

This course offers you expert knowledge of the nature-like fishways design process. Featuring the latest design information, internationally recognized instructors, and workshop/case study opportunities that will further your understanding of this innovative approach, the course will show you how nature-like fishways are proving to be an effective, affordable approach to fish passage.

You can expect to

- increase your knowledge of European nature-like fishway design
- understand differing design perspectives
- learn how to design fish passages in conjunction with the site's ecology, and more!

Discussion Highlights

Your learning experience will be interactive and fast-paced. Plan to focus on these and other practical topics:

- the ecological perspective of designing nature-like fish passage
- a fisheries perspective of designing nature-like fish passage
- engineering perspectives of designing nature-like fish passage
- German and European policy and development for river restoration and connectivity
- state-of-the-art design of nature-like fish passage in Europe
- successful design processes and approaches
- open channel design (workshop)

Who Will Benefit

This advanced course will benefit

- design engineers
- regulatory agency staff
- fisheries managers
- fisheries biologists
- dam owners
- public sector professionals
- ecological consultants
- conservation personnel
- planners

Expert Instructors

Your instructors, who are experts working in this cutting-edge area, will share with you key insights and approaches gained from multiple projects and years of experience. A special feature of the course will be the addition of **Dr. Uli Dumont**, principal of Floecksmuehle Consulting in Aachen, Germany. Dr. Dumont will address European experiences with design of nature-like fish passage.

Special Course Materials

In addition to a comprehensive course notebook, you will receive the book, *Fish Passes: Design Dimensions and Monitoring*, a \$28 value. This difficult-to-get book was originally published in German by Deutscher Verband fur Wasserwirtschaft and Kulturbau e.V. and published in English by the Food and Agriculture Organization of the United Nations.

Earn Continuing Education Credits

By participating in this course, you will earn 1.5 Continuing Education Units (CEU) or 15 Professional Development Hours (PDH).

Course Planning Committee

Ken Bates

Fishway Consultant

Patrick Eagan

University of Wisconsin–Madison

Stephanie Lindloff

New Hampshire Department of Environmental Services

David Robinson

North Carolina State University, Center for Transportation and the Environment and North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program

Mike Wicker

U.S. Fish and Wildlife Service

Laura Wildman

American Rivers

Course Outline

Wednesday, January 12

1:00 Registration

Sheraton Raleigh Capital Center Hotel
421 South Salisbury Street
Raleigh, North Carolina

1:30 Welcome and Introduction

Patrick Eagan PhD, PE
Program Director/Associate Professor
Department of Engineering Professional Development
College of Engineering
University of Wisconsin–Madison

1:50 Regional and National Overviews of Fish Passage – Case Study

Sara Nicholas
Associate Director of Dam Programs
Mid-Atlantic Region
Harrisburg, Pennsylvania

3:00 Break

3:20 Overview of the Fish Passage Design Process and Introduction to Nature-like Fishway Design, River Continuum

Ken Bates
Fish Passage and Habitat Restoration Engineer
Olympia, Washington

5:00 Adjourn for the Day

Thursday, January 13

7:30 Coffee and Conversation

8:00 German and European Policy and Development for River Restoration and Connectivity

Dr. Uli Dumont
Principal and Engineering Consultant
Floeksmuehle Consulting
Aachen, Germany

8:45 State-of-the-Art Design of Nature-like Fish Passage in Europe

- Design and dimension
 - Examples
- Uli Dumont*

10:00 Break

10:20 An Ecological Perspective of Designing Nature-like Fish Passage

- Perspectives on rock ramp fishways
 - Rapids conversion
 - Fish requirements
 - Design processes
 - Examples
- Luther Aadland*
Research Scientist-River Ecologist
Minnesota Department of Natural Resources
Fergus Falls, Minnesota

12:00 Lunch

1:00 A Fisheries Perspective of Designing Nature-Like Fish Passage

1:30 Open Channel Design Workshop

Brent Mefford
Hydraulic Engineer
Bureau of Reclamation
Water Resources Research Lab
Denver Federal Center
Denver, Colorado

2:45 Break

3:00 Cape Fear Lock and Dam Number One Case Study

Frank Yelverton
Lead Biologist
United States Army Corps of Engineers
Wilmington District
Wilmington, North Carolina

4:30 Adjourn for the Day

Friday, January 14

7:30 Coffee and Conversation

8:00 An Engineering Perspective of Designing Nature-Like Fish Passage

Boulder Weir
Brent Mefford

10:00 Break

10:15 Course Summary

12:00 Lunch on Your Own and Final Adjournment

For Related Course Descriptions

<http://epdweb.engr.wisc.edu/catalogs/civil.lasso>

Attend Both Courses and Save!

Our two courses on engineering innovative fish passage address economic, biological, and environmental issues that impact property owners, agency and tribe personnel and the general public, as well as the native species in the region.

By attending, you can gain a broad perspective by focusing on the basics of fish passage systems, how they relate to designing functional fish passages, and how to design nature-like fishways, which are proving to be an affordable, effective alternative.

Save \$295 by enrolling in both courses, and position yourself at the cutting edge of engineering innovative fish passage in this country.

Both Courses Feature...

- Speakers with extensive first-hand knowledge
- Comprehensive, practical information you can apply immediately
- Valuable course materials that will be useful references long after you return to work
- Opportunities to share ideas and solutions with others in your field of interest
- Hospitality from one of Raleigh's finest meeting venues, the Sheraton Raleigh Capital Center Hotel

On-site Courses Save Time and Money!

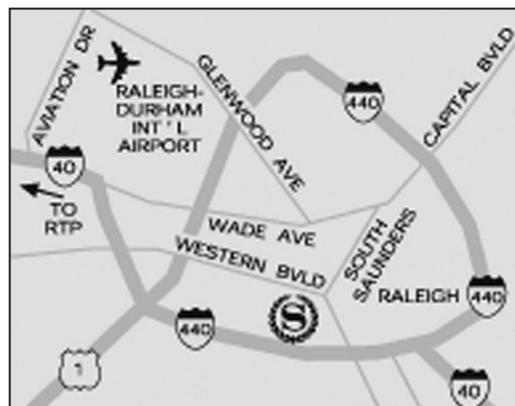
Engineering Professional Development can offer many of its courses:

- At a location of our choice in North America
- At your convenience
- At reduced per-person cost
- Tailored to your needs

To inquire about courses that we can bring to your site, including optimal group size and costs, or to request an on-site course, call 800-462-0876 or check our Web site at <http://epdweb.engr.wisc.edu/onsite/>

Coming by Car?

From Raleigh-Durham Airport, take Exit 298-B (South Sanders Street). South Sanders Street becomes McDowell Street. Stay on McDowell and take a right onto Davie Street, then a right onto Salisbury Street. The Sheraton is one block on the left. To enter parking deck, take immediate right onto Gale Street. Sheraton Parking Deck entrance is second on the right. Parking is \$2 per hour, maximum cost \$10.



Four Easy Ways to Enroll

Need to Know More?

Call toll free **800-462-0876** and ask for

Program Director:

Patrick Eagan PhD, PE
eagan@engr.wisc.edu

Program Assistant:

Diane Lange

Or e-mail custserv@epd.engr.wisc.edu

General Information

Fee Covers Course materials, break refreshments, lunches and certificate. Course materials are distributed only to course participants. We do not publish proceedings.

Cancellation If you cannot attend, please notify us at least 7 days prior to the first day of the course, and we will refund your fee. Cancellations received after this date and no-shows are subject to a \$150 administrative fee. You may enroll a substitute at any time before the course starts.

Location Sheraton Raleigh Capital Center Hotel (<http://www.sheraton.com/capitalcentr>), 421 South Salisbury Street, Raleigh, North Carolina.

Accommodations We have reserved a block of sleeping rooms (\$82/single or double plus tax) for course participants at the Sheraton Raleigh Capital Center Hotel, the course site. To make a reservation, call 800-325-3535 by December 18 and tell the reservation specialist that you will be attending the UW-Madison course, *Engineering Innovative Fish Passage: Design of Fish Passage at Dams and Road Crossings* or *Engineering Innovative Fish Passage: The Design of Nature-like Fishways*, or both courses. After December 18, the special room rates will still be available for attendees if rooms are available.



Phone:
800-462-0876 or
608-262-1299 (TDD 265-2370)



Internet:
<http://epdweb.engr.wisc.edu/webG557>

Mail to:

Engineering Registration, The Pyle Center
702 Langdon Street, Dept. 107
Madison, Wisconsin 53706



Fax:

800-442-4214 or 608-265-3448



Course Information

Please enroll me in

- Course #G556 Engineering Innovative Fish Passage: Design of Fish Passage at Dams and Road Crossings**
January 10-12, 2005 in Raleigh, North Carolina Fee \$895
- Course #G557 Engineering Innovative Fish Passage: The Design of Nature-Like Fishways**
January 12-14, 2005 in Raleigh, North Carolina Fee \$895
- Both courses (#G556/#G557)** January 10-14, 2005 in Raleigh, North Carolina Reduced Fee: \$1495
- I cannot attend at this time. Please send me brochures on future courses.

Personal Information (Please print clearly.)

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Phone (_____) _____ Fax (_____) _____
E-mail _____

Additional Enrollees

Name _____
Title _____
E-mail _____
Name _____
Title _____
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