April 2025

DEPARTMENT OF NATURAL RESOURCES

River Health & Restoration Workshops

Offered by the Minnesota DNR River Ecology Unit

Upcoming workshops:

- **2025:** Dam Removal, Ecological Implications, & Challenges
  *September 23-25, Fergus Falls MN. 3 days, $400. *Registration now open, form on page 4.*
- **2026:** The Fundamentals of River Science: Applied Geomorphology & Ecology
  Date and location to be determined. 5 days, $1,000.

Future workshops: *Refer to the course descriptions below for our full assortment of workshops offered. For inquiries or to express interest, email Amy.R.Childers@state.mn.us.*

Our rivers and streams have been impaired by many factors resulting in poor water quality, lost biodiversity, accentuated flooding and drought, and increased rates of erosion and sedimentation.

As our rivers have become more widely recognized and appreciated as valuable natural resources that need restoration, the responsibility to better understand and properly restore these complex ecosystems takes on great importance. To that end, the Minnesota Department of Natural Resources (DNR) offers a variety of stream related workshops.

The foundation of these workshops is to a) teach the fundamentals of stream science including: fluvial geomorphology, hydrology, connectivity, biology and water quality and to b) educate attendees in reference reach geometry techniques and approaches that ensure long-term health, stability, and resilience.

Our definition of RESTORATION:

The act of relaxing human constraints on the development of natural patterns of diversity, where restoration measures should not focus on directly recreating natural structures or states but on identifying and re-establishing the conditions under which natural states create themselves (Ebersole et al. 1997, and Frissell et al. 1997 Frissell and Ralph 1998).

Our definition of SUCCESS:

Implementing projects that re-establish self-sustaining geomorphic and ecological processes that form & maintain quality habitat and protect or restore biodiversity.

Find more information on our websites:

Minnesota DNR - River Ecology Unit** or **River Health & Restoration Workshops

General workshop information

- We take requests into consideration when scheduling each year's workshop(s), so we ask those interested in future workshop(s) to express interest directly to Amy Childers.
- Course offerings are limited due to small staff size in addition to field and research responsibilities.
- Beverages, snacks, lunches, and some suppers are included.
- Lodging is not included in the registration fee.
- Fieldwork is required so students need to be prepared to wade in streams and work outside in inclement weather conditions.

Instructors:

Neil Haugerud *is a River Ecologist and Restoration Consultant. He is experienced in stream biological monitoring, macro-invertebrate identification, reference site selection, and evaluating water quality. Neil's work focuses on project monitoring, river restorations, dam modifications, and geomorphological data analysis and management.*

Mark Ellefson *is a River Geomorphology GIS Specialist. His field experience encompasses fish sampling, bedload and suspended sediment sampling, discharge measurement, terrestrial LiDAR scanning and topographic surveying of stream channels. Mark's work focus is integrating field collected geomorphic data with GIS watershed analysis to better categorize the state's river systems and their geomorphic stability and erosion potential.*

Amanda Hillman-Roberts *is the Restoration Coordinator. She is experienced in project development, geomorphic monitoring, culvert assessment and working with legislators and funding councils. Her work focuses on identifying, coordinating, prioritizing and funding channel restorations and dam removal/modification projects.*

Paul LeClaire *is a Professional Engineer with expertise in hydraulic modeling and design related to stream restoration projects. His experience allows him to contribute valuable insights to numerous stream restoration projects across Minnesota.*

Howard Fullhart *is a River Ecologist and Fish Biologist. His duties include project development, project oversight for channel restorations and dam removal/modifications, geomorphic monitoring, and project monitoring.*

Amy Childers *is the Training and Outreach Coordinator. She has been coordinating and helping instruct these workshops since 2007. Her other work focuses on stream science outreach, research and publications, river restorations, and geomorphic monitoring.*

DNR staff *from the River Ecology Unit and Clean Water Legacy Program (both within the Division of Ecological and Water Resources) and the Division of Fisheries instruct in their respective areas of expertise and provide expertise during field exercises.*

Invited speakers *from various agencies and organizations also provide expertise and instruction on occasion.*

Short Courses

Dam Removal, Ecological Implications, and Challenges

No prerequisites

This workshop teaches the fundamentals of stream function and health by first explaining the various ways streams are affected by dams. Then we will discuss the different perspectives, processes, and challenges involved in dam removal or modification projects from beginning conversations, to permitting, to design and construction. Design options for dam removal or modification, fish passage, and natural channel design will be explained and demonstrated. This workshop includes time for organized conversations around the challenges and goals of dam removal projects and an afternoon bus tour of local projects.

This workshop can be taken by those with any level of expertise that wants to better understand the impacts of dams, the range of options that have been implemented, and the variety of processes involved. *3 days. $400.*

A similar workshop we offer is **The Ditching Dilemma** that addresses the impacts of ditches and delves into options for restoring ditched or channelized streams.

Diagnosing Streams: Symptoms, Underlying Causes, & Remedies

No prerequisites

This workshop provides fundamental river This workshop provides fundamental river science learning and practical experience in diagnosing stream condition and the underlying causes of degraded health. This workshop teaches:

- the fundamentals of river "physiology and anatomy" -- hydrology, fluvial geomorphology, and ecology,
- the underlying causes and the resulting impacts to stream stability, water quality, and biodiversity,
- demonstrations of diagnostic tools, and
- practical experience gained by stepping through real examples including examples brought by attendees.

This workshop can be taken by those with any level of expertise that wants to learn how to identify stream issues and practice diagnosing the underlying causes of degraded stream health and function. *3 days. $400.*

River Science Series

This series of workshops teaches the basic functions and processes of streams and rivers; stream classification; field surveying; assessment and monitoring of channel morphology, stability, and sediment transport; and restoration where natural, stable stream reaches are used as templates for design.

This series is designed for natural resource professionals whose work involves rivers and streams as well as those engaged in watershed-wide resource management issues. These workshops are a mix of lectures and field applications where students are required to complete intense fieldwork, data analysis, and present their findings. The goal of this series is to develop a foundation for work in this field where ongoing fieldwork, project experience and interdisciplinary collaboration will be critical to effective stream restoration.

The Fundamentals of River Science: Applied Geomorphology & Ecology

No prerequisites

Rivers and streams are formed by hydraulic, geomorphic, and biologic processes. This course discusses the fluvial geomorphological processes involved in creating and maintaining a stream's shape and stability, as well as the fundamental hydrology and hydraulics of rivers. We teach the skills necessary to properly determine a stream segment's type and degree of stability that requires the collection of field data needed for classifying streams based on bankfull channel dimensions, sinuosity, entrenchment, and slope. Upon completion of this course, students will have the field and office skills needed to classify a stream reach, greatly facilitating communications and planning among river managers worldwide. Students will also have a firm knowledge of the functions and processes that are critical to a river's health and biodiversity. *5 days. $1,000*

River Monitoring & Assessment

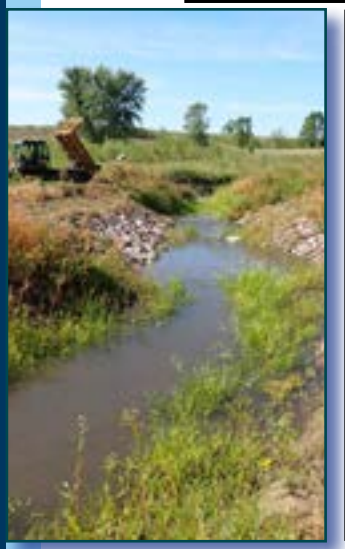
Prerequisite: The Fundamentals of River Science: Applied Geomorphology and Ecology

This workshop is designed to teach natural resource professionals how to assess a stream's condition and stability and how to monitor streams through time.

Concepts taught include: • *stream monitoring design and evaluation • sediment transport • channel stability assessment • use of biological indicators • understanding riparian vegetation.*

Techniques used include: • *geomorphic surveying, • Pfankuch's Stability Rating system • biological sampling • BANCS Model – quantifying channel source sediment contribution • introduction to suspended and bedload sediment sampling methods • Prediction Level Assessment (PLA) of the Watershed Assessment of River Stability and Sediment Supply (WARSSS) methodology • riparian and channel monitoring techniques.*

Students completing this course will be able to quantitatively describe a river's stability and condition through applying industry standard techniques and reporting. These skills provide natural resource professionals the ability to monitor a river's condition over time in a non-subjective manner then apply this knowledge in restoration prioritization. *10 days. $1,500*



Restoring River Ecosystems: Design & Application

Prerequisite: The Fundamentals of River Science: Applied Geomorphology and Ecology

This course will incorporate principles, methods, and tools for holistic stream restoration using natural materials and designs, with an emphasis on re-establishing both geomorphic and ecological processes. Fundamentals of restoration design that will be explained include: 1) diagnosis of underlying problems, 2) incorporation of local reference morphology, geomorphic and ecological processes, and 3) project design and construction techniques. Project types discussed will include remeandering straightened/ditched channels, dam removal, channel restoration following removal of dams with sediment laden reservoirs, dam conversion to a rapids, fish bypass channels around dams, culvert replacement/remediation, and bank stabilization. In addition to classroom lectures and field observations, students will design a restoration project utilizing collected and provided field data. Students will also test designs in a laboratory stream model. With this course, students will develop their foundation for work in this field that with ongoing fieldwork, project experience and interdisciplinary collaboration will lead to effective stream restoration. *5 days. $1,000*

DEPARTMENT OF NATURAL RESOURCES

2025 River Ecology Unit Workshop Registration Form

Registering for:

Dam Removal, Ecological Implications, & Challenges

September 23 - 25, 2025 in Fergus Falls, MN Registration fee = $400

Registrant Information:

_____
First & Last Name

_____
Title/Position

_____
Organization/Agency

_____
Street Address

_____
City, State, Zip

_____
Daytime phone

_____
E-mail address

_____
Food allergy or dietary need

2025 Dam Removal workshop details:

- For travel plans, this workshop starts at 12:30 pm on Tuesday and adjourns by 3:30 pm Thursday.
- Suppers will be provided Tuesday and Wednesday. Lunches will be provided Wednesday and Thursday. Refreshments and snacks will be provided throughout. Please bring your own coffee mug and water bottle.
- Lodging is not included in the registration fee. Attendees must make their own hotel reservations. A block of rooms has been reserved at the AmericInn at 526 Western Ave, Fergus Falls. Phone: 218-739-3900. The block's code will be available with registration.

- Payment is due with registration.
- Minnesota DNR staff or other state agencies can pay by purchase order. For all others, checks should be made out to 'Minnesota DNR'. (***Sorry, we can not accept credit cards.***)

☐ Check is enclosed (payable to **Minnesota DNR**)

☐ Paying via purchase order (if Minnesota state agency) PO# _____

☐ If payment is not included, explain when payment will be made. _____

- Registrations will be handled on a first come/ first served basis; class size will be limited to 40 students.
- Cancellation after registering will result in a $50 penalty. Cancellations less than two weeks prior to the first day of the workshop will result in forfeit of the registration fee or use towards a future workshop.
- Workshop cancellation due to low enrollment will be determined at least two weeks prior to the start date.

Email or mail registration & payment to:

Attn: Kristie Brezina
Minnesota Department of Natural Resources
1509 First Avenue North
Fergus Falls, MN 56537
Phone (218) 671-7977
Fax (218) 739-7601
Kristie.Brezina@state.mn.us

Emails will be sent to confirm registration and payment was received and to provide workshop information as the workshop date approaches.

For workshop questions or to express interest in future workshops contact:
Amy Childers, Training & Outreach Coordinator
Minnesota DNR - River Ecology Unit
Phone: (218) 671-7937
Amy.R.Childers@state.mn.us