

RIVER RESTORATION KNOWLEDGE EXCHANGE WORKSHOP - INSTRUCTORS

Mike Bradford **Scientist Emeritus, DFO**

Mike has recently retired from DFO after 30 years largely in habitat science. He is interested in the relationship between habitat conditions and salmon production, and the ways to monitor and detect changes in salmon both at local and population-level scales. Much of my work has focused on flow and water management effects.



Thinking about habitat monitoring: the “Why” sets the stage for “What” “When” “Who” and “How”

In this talk, Mike argues that the success of a habitat monitoring program depends on clear thinking about why we want to monitor. Failure to identify realistic goals, and the kind of monitoring that is required to meet those goals, can lead to inefficient use of resources and uninformative outcomes. Mike will discuss the use of pathways of effects, or influence diagrams, to help think about the effects of restoration on habitat condition and the development of indicators. Finally, he'll draw on a few examples of successes and challenges to illustrate these ideas.

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Karen Smokorowski
Adjunct Research Professor (Carleton University), Research Scientist (DFO)

Karen works to understand the impacts of human activities on freshwater ecosystem – specifically, she provides research linking anthropogenic activities (e.g., hydroelectric dams and habitat alteration) to effects on fish and lower trophic levels.



Monitoring of aquatic habitat offsets in Canada: Learning by standardizing sampling design, approaches, and evaluation

This presentation will describe current efforts to modernize how DFO-required monitoring is conducted by producing standardized protocols, data collection, and storage solutions that would allow for periodic meta-analyses. This achievement would transform how monitoring data are used and reported, would iteratively contribute to more effective decision-making, and ultimately benefit the advancement of aquatic habitat impacts, offsets, and restoration science in Canada.

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Doug Braun **Research Scientist, Freshwater Ecosystems** **Section, DFO**

Doug is an ecologist broadly interested in how environmental variation, from both natural and anthropogenic sources, shapes salmon populations and their habitat.



Overview of the North Thompson Salmon Ecosystem Research Program

Doug will provide an overview the North Thompson Salmon Ecosystem Research Program and discuss how watershed scale monitoring and research can inform restoration activities. He will touch on three key research themes:

- 1) Identifying where juvenile salmon are in the watershed;
- 2) Habitat-productivity relationships; and
- 3) Evaluating the impacts of land use on watershed processes.

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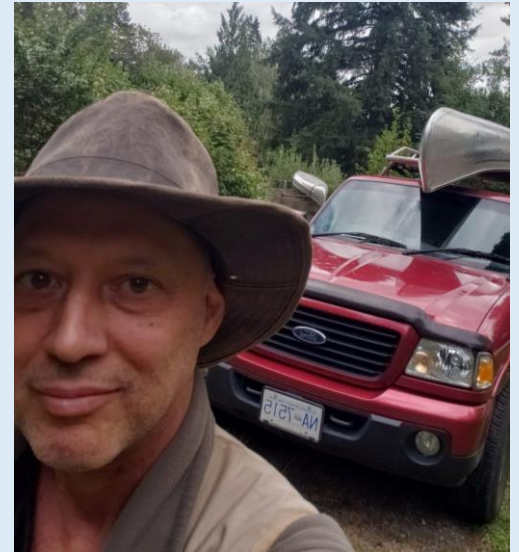
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Mike Pearson, PhD **Senior Biologist, Pearson Ecological**

Mike has 30 years of field experience and leads many research and recovery projects on various fish species in B.C. He has extensive experience in the design, construction and monitoring of habitat restoration and enhancement projects and is known for creating diverse, naturalistic habitats that benefit multiple species.



Using Indicators, Thresholds, Automated Calculators and Report Cards to create Regional and Habitat-specific Monitoring with a Standardized Foundation

- Standardization of monitoring methods is challenging, but can be partially addressed using several standardized indicators supplemented with indicators specific to target species and habitats
- Identifying quantitative thresholds for indicators can be used to provide a clear basis for comparison between seasons, years and sites
- Excel or dedicated app based calculators can provide standardized analyses and accessibility groups with minimal technical support, and can be integrated with plain-language report cards to convey results and interpretations

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Kasey Moran **PhD Candidate, UBC**

Kasey's research in John Richardson's lab focuses on cottonwood forests in the Okanagan, including the impacts of river diking and channelization & restoration via planting and habitat improvement projects. She's worked with various groups on riparian and freshwater habitat restoration, drinking water source protection, and watershed ecosystems.



Opportunities to advance diverse objectives through riparian restoration monitoring

- Overview of cottonwood ecological theory, threats, and typical restoration methods (i.e. planting and dike setback), with examples from the Okanagan
- Common monitoring objectives and protocols associated with two restoration methods, what we learn from them, how they might be applied to restoration design and adaptive management, and what gaps they leave in terms of advancing understanding and improving outcomes
- Suggestions for additional monitoring objectives and protocols to advance understanding, challenge theoretical assumptions, and improve ecological and societal outcomes

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Karilyn Alex Fisheries Biologist, Okanagan Nation Alliance Fisheries Department

Karilyn's major area of study is river restoration in regards to salmon spawning and egg incubation habitat through the guidance from Traditional Ecological Knowledge, and has been working with the Okanagan National Alliance Fisheries Department since 2002.



A history of monitoring the Okanagan River Restoration Initiative

The Okanagan Nation Alliance have 20 years of monitoring data specific to the restoration of spawning and rearing habitat for salmon in the Okanagan River. Traditional Ecological Knowledge have guided restoration works while monitoring data have assisted in helping us learn on how to return the rivers energy.

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Tom Willms **PhD Candidate, UNBC**

Tom's co-supervisors are Dr. Mark Shrimpton (UNBC) and Dr. Tom Pypker (TRU). Tom feels truly privileged to have been raised in the Nicola Valley, on the unceded traditional territories of the Nlaka'pamux and Syilx Peoples. "Fish are very important to me, but equally so is place."



Characterization of thermal refuge habitats and habitat use by stream-dwelling juvenile Pacific salmon and steelhead – Nicola River, BC

- Mapping and documenting changes in thermal refuge habitats using RPAS-based thermal infrared imaging;
- Characterizing thermal properties and vertical hydraulic gradient associated with refuge habitats and changes in response to environmental covariates; and
- Studying diel horizontal migration patterns of juvenile salmonids between mainstem and refuge habitats using passive integrated transponder (PIT) tags.

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