pacific northwest aquatic monitoring partnership

Intensively Monitored Watersheds Workshop

November 1-2, 2016, Portland, OR

Workshop Summary

This document summarizes workshop highlights and identified actions. There is also a companion document that contains more detailed notes for discussions and work sessions that took place over the two days of the workshop.

Background

Intensively Monitored Watersheds (IMWs) are long-term, large-scale research projects designed to gauge the benefits of stream restoration for salmon and other native fish. At least 17 IMWs in the Northwest are beginning to provide detailed scientific insight into how the millions of dollars invested in river and stream restoration can most effectively boost fish populations. In 2005, PNAMP outlined a suite of action effectiveness approaches and a context for how IMWs could coordinate efforts as a network (PNAMP 2005 white paper). To facilitate coordination and communication among IMWs and between IMWs and regulatory agencies, PNAMP has hosted three workshops, in 2008, 2013, and this third 2016 workshop. The 2013 workshop resulted in two publications that clarified definitions of and the role of IMWs as long term monitoring entities, while illustrating challenges and summarizing results from 17 IMWs (Bennett et al. 2016, Bouwes et al. 2016). In 2016, PNAMP hosted this workshop with the goal of improving the flow of information about tools, results, and guidance produced by those working in IMWs to those who can apply this information to improve decision-making, policy-guidance, and on-the-ground restoration/mitigation/enhancement actions. Feedback received during workshop discussions and work sessions will be used to develop a realistic plan to improve bilateral communications among IMWs stakeholders that will ensure IMWs outcomes (tools, results, and guidance) are valuable to policy/decision-makers and managers implementing actions on the ground.

Workshop Objectives

- Foster communication and the sharing of information between IMW stakeholders
  - » Discuss how IMW results are being used by regulatory and non-regulatory entities
  - » Share results and lessons learned - what works and what doesn't work
- Develop an action plan to better connect stream restoration, monitoring, and policy

Workshop Results – Identified Actions

Actions to improve communication:

- Develop a product that standardizes reporting among IMWs; have policy and technical staff work together to develop
  - » One page template with pre-built sections and data visualization that easily communicates information
  - » Have policy entities clarify and communicate to monitoring practitioners what interim results and progress reports would be acceptable
  - » Communicate whether reporting minimal or negative results, or a series of restoration actions taken comprise acceptable reporting
- Improve the table in the Bennett et al. paper
  - » Categorize IMWs based on purpose, basic attributes, and design
  - » Remove reporting language "don't know" or "undetermined"; replace with categories that report progress of actions accomplished (e.g. increased woody debris by X % in X km)
  - » Have a cartoon or other visual to define and describe IMWs
- Institute more frequent meetings, standing teleconferences, and formal committee(s) of IMW representatives to define and develop the IMW network
  - » Identify individual representatives for IMW regional network committee/forum from each IMW and from policy and restoration entities, and other stakeholders.
  - » Identify spatial scale of IMW network. For instance, should an IMW network be confined to an ecoregion?
  - » Network could explore sharing of data for metadata work, modeling beyond a given population or IMW, and scaling up data

  - » IMW network could explore different funding models, e.g. long term ecological research (LTER) networks
  - » IMW network could work to standardize reporting of interim results
- Special session(s) proposed for IMW representatives and policy representatives at the Salmon Recovery Conference, Wenatchee WA, April 2017
- IMW website (possibly a subsection of pnamp.org)
  - » Need the ability to report answers
  - » Post questions and get answers (blog), share lessons learned
  - » Tables to fill out to think at a broader scale

Actions to improve integration:

- Identify a case study that clarifies how Adaptive Management can be informed by monitoring programs. Use one that included restoration, or a use of pre-set thresholds of abundance, or habitat criteria.
- Present how life cycle modeling using monitoring data can inform whether fish populations respond to restoration, and in which directions. Example: Rich Zabel's life cycle modelling group.
- Poll policy makers to determine how much change they wish to see and in what timeframe
- Manage expectations for realistic timeframes

Workshop Overview

- All workshop documents are posted on PNAMP.org, overview presentation slides are here.
- Over 75 participants representing 36 organizations attended the two day workshop.
- A Panel Discussion focused on "Current Uses and Future Needs for IMW Results"
  - » *Panelists: Jennifer Anders, NPCC; Mike Edmondson, ID OSC; Patty Dornbusch, NOAA; Phil Rockefeller, SRFB; Zach Penney, CRITFC; Ben Zelinsky, BPA; and Renee Davis, OWEB. Moderated by: Ken Fetcho, OWEB*
  - » Each of the panel members addressed three questions:
    1. How are IMW results being used?
    2. What's working well?
    3. What can be improved?
  - » The panel discussion indicated that overall needs include:
    - o Better communication of results, interim reporting, and better formats for reporting
    - o Improved communication and understanding of how to summarize and share the data with non-technical audiences
    - o How to communicate the long timeframe to funders and each other
    - o Getting, using, and presenting intermediate results given the timeframe of IMWs and biological processes are long
    - o Understanding IMWs as a tool, what the results mean, and how they can be used
    - o Understanding if IMWs are being used effectively or if we need to alter our approach
- Four technical presentations focused on results and lessons learned:
  - » Does restoration work? What we've learned from IMWs so far - *Stephen Bennett, US*
    - o IMWs are watershed scale experiments designed to answer the question "Does restoration work?"
    - o Expectations should be realistic: unlikely that restoration will work every time in all places, therefore, need to design IMWs to provide insight into system function within an Adaptive Management Framework (i.e., **maximize learning**)
    - o Increased knowledge will allow extrapolation of IMW results to other watersheds that do not have intensive monitoring
    - o Many IMWs are finding significant positive changes in habitat and fish due to restoration and further results from many IMWs are expected within 3-5 years
  - » Monitoring, modeling, and recovery management: learning from IMWs how to make salmon make more salmon - *Sean Gallagher, CDFW*
    - o There have been huge impacts to Northern CA's coastal watersheds over the past 150 years, primarily due to harvest of ancient redwoods

    - Northern CA's coastal salmon and steelhead were listed in the 1990's and the primary listing factor was uncertainty - nobody knew how many fish returned to spawn or how the populations were fairing
    - Beginning in 1999 we used science to develop best methods for providing VSP parameters: Abundance, productivity, spatial structure and diversity. The result is the California coastal salmon population monitoring plan, which is now implemented across the state and includes life cycle monitoring. We now know with statistical certainty how many Coho Salmon and steelhead return to spawn in the area.
    - The life cycle monitoring work led to the development of the Pudding Creek IMW where we are evaluating if large wood addition will create more smolt. Learning from this experiment is being translated to rivers and streams throughout the coastal region.
  - » Communicating and collaborating to make the most of your IMW - *Greer Maier, UCSRB*
    - There are enormous amounts of effort and funding put into monitoring and research in IMWs and yet there is an inherent challenge coordinating and collaborating to leverage these data in the watersheds in which they are collected at the times when they are most needed (when identifying, developing, designing and then trying to fund restoration). This challenge can sometime result in the failure of an IMW for a number of reasons (e.g. lack of a biologically-based restoration strategy, lack of funding for restoration, lack of support).
    - IMWs would benefit from building a strong foundation of partnership with restoration and monitoring funders, regional organization, restoration sponsors, and willing landowners. To create such a foundation, IMW researchers need to focus as much on the beginning steps of developing a restoration strategy and designing projects as they do on the end results of restoration outcomes.
    - Understanding the audiences involved in restoration in a watershed and their information needs would be beneficial to IMW practitioners.
    - Being involved in all steps in the restoration process allows IMWs to set up testable hypotheses about the projects we are implementing, their expected biological goals and objectives, and the actual outcomes in the population.
    - IMWs moving forward would benefit from adopting the following attributes: partner-driven, integrated into local process, relevant to decision-making, and adaptable to changing circumstances.
  - » The IMW Network: Gaps, Questions, and the Future - *Chris Jordan, NOAA*
    - Ecosystems can be manipulated and the opportunity for learning increases with the scale of the manipulation
    - Characteristics of successful large-scale ecological experiments include: the use of conceptual, graphical and mathematical models; the use of all available information; a simple design aimed at important contrasts; and a commitment to monitoring.
    - Barriers to progress in large-scale ecological experiments include: Nature: Intrinsic difficulties of large ecosystem manipulations (variability, multiple causality, slow dynamics); Science: Reward system focused on narrowly disciplined individual achievements and fast publication, which selects for ever more precise answers to the wrong questions; Management: Preference for command and control, lack of institutional mechanisms that promote learning from experience; and Institutional: difficulty of sustaining creativity in large teams over long periods of time
    - Why do IMWs? To learn from them and disseminate that information. John Day IMW is a great example that you can extrapolate from a reach to watershed scales, and ask questions of the data and get answers useful for management.
- Day 1 Brainstorming Session: Participants divided into six groups and identified themes and general topics that could improve the science-to-policy connections with respect to IMWs. Workshop participants voted on the identified topics. The four topics with the most votes became the focus of Day 2's work sessions.
- Day 2 provided an opportunity for five topics (four that were determined from voting on Day One, and one pre-determined topic) to be discussed in rotating breakout groups. Participants focused on identifying strategies and solutions for improving connections between science and policy for each topic.
  - » Topic 1 - Communicate to Policymakers about IMWs
  - » Topic 2 - Facilitate Learning and Collaboration

- » Topic 3 - Design Considerations for Managing Expectations across IMWs
- » Topic 4 - Adaptive Management
- » Pre-determined Topic 5 – PSMFC/NOAA Summary Report

Day 2 Work Session Highlights

Discussions produced recurring themes across the work session topics that largely addressed issues of how to manage expectations. Themes mentioned most often were:

Science to Policy

- Define and understand timelines to manage results, reporting, and funding among all entities
- Implement standardized formats among all IMWs to communicate results to policy entities from IMWs, including visualization of interim results
- More frequent meetings and use of online venues that foster communication among IMWs and between IMWs and regulatory agencies
- Hiring or convening people with different skills, such as
  - » An acting policy liaison
  - » A person to use structured decision making (SDM) across IMWs to better know when and how to implement recommendations from reported results
  - » Committee(s) of representatives from IMWs to facilitate collaboration and integration

IMWs as a network

- Need better definition of the network of IMWs as an entity, to better coordinate data and results sharing, and promote effective communication;
- Synthesis and consolidation of results across IMWs at multiple scales, such as an approach that uses integrative modelling of metadata, incorporates life cycle models and population responses to habitat.

Topic 1 - Communicate to Policymakers about IMWs *(facilitated by Nancy Leonard)*

- We need better communication to resolve the mismatch between biological timelines and timelines required for people in regulatory agencies to report and use information.
  - » IMW policy session proposed at upcoming conferences, or integrated as continuing sessions at state and regional conferences such as AFS.
  - » Policy practitioners develop a template for IMW practitioners to communicate quickly and visually:
    - o Definition, scope, and purposes of IMWs
    - o Incremental results and progress reporting, not necessarily statistically significant results
    - o Integration and extrapolation of IMWs results to multiple watersheds or multiple scales
- We need to develop a different funding model
  - » Define the IMW network to support IMWs in the network, when one gets less funding, others can step in.
  - » Given that IMWs work with a biological long-term timeframe, develop the funding model and sources used by other long term monitoring programs, such as NEON or LTERs.

Topic 2 – Facilitate Learning and Collaboration *(facilitated by Greer Maier)*

- Do we need to share info? Yes
  - » Share lessons learned and tools that work
  - » IMWs need to communicate as a network with each other AND with policy makers
- Inhibitors of sharing
  - » Very different formats
  - » Confounding and periodic factors such as large perturbations, hatchery influence
- How to share? Develop products and forum for sharing information
  - » Learn how other networks like LCCs share information and use those lessons learned
  - » Convene an executive committee of IMWs to:
    - o Prioritize and identify topics to address
    - o Address specific issues

- » IMW managers have standing phone call to share results
- » Plan and contract with people who can commitment necessary time to the project
- » Use a blog or living website
  - o Use the PNAMP website as a forum. Each IMW has an individual page; who they are, what data they are collecting
  - o Record presentations from all IMWs and upload their documents
- Timing? IMW summary reports are due in 2017, so start after the IMW reports are submitted (in 2018)

Topic 3 - Design Considerations for Managing Expectations *(facilitated by Chris Jordan & Sean Gallagher)*

- IMW Definition: A watershed treatment with a before/after (BA) design, but they incorporate other elements
- To define IMW Network need to identify elements that link IMWs into a network, e.g. species, or study designs
  - » We need to be explicit about the timeline of the experiment. Link designs and implementation to a timeline with outputs and uses.
  - » Currently there are many restoration types being implemented
- Three issues or problems
  1. Expectations are a large issue
  2. How to manage risk for an IMW
  3. Not having control over controls. We lose contrast over a control vs. treatment when a control changes or decays.
     - o We can mitigate w/staircase designs, but we need to plan ahead of time
     - o BA is weakest design, unless you use the network of IMWs as replicate treatments, and they have a common response variable
     - o Network of IMWs could support inference if we use their results collectively
- Questions about best practices:
  - » How can we use and implement best practices?
  - » Are there best practices to keep the scientific rigor for watershed scale experiments that are not originally designed as an IMW?
  - » How can we keep watershed experiments going that are not originally designed as IMWs?
- We started with design based inference. What if we can't show cause-effect?
  - » We can turn to model based inference. Turn to reach scales, incorporate LCMs, and use a process model to make inferences to other areas, and use simulations of influences on life cycles, broaden areas.
  - » Need to think about what people are going to do with the IMW data. Create tools that managers can use to turn the IMW information into future decisions.
- We can create infrastructure, but if we are not willing to invest in the infrastructure it will not be useful.

Topic 4 - Adaptive Management *(facilitated by Chris Jordan & Steve Bennett)*

- Difficult in Adaptive Management (AM) to identify objective of the work
- Need to clarify what is AM, and know AM of what. We need to stop thinking about just implementation and how others are using the information.
  - » Funders are thinking of adaptively managing all information that IMWs produce
  - » Clarify the difference between IMW adaptive management level (of one IMW) and clarify funders' adaptive management of many IMWs
- Structured Decision Making is used to develop scenarios for major issues
  - » How can we support using those tools in IMWs – no one is using it now and it would help with decision-making and choosing priorities
  - » Identify an adaptive management/structured decision making professional to do the work of defining objectives, structured plan etc.
- There is a need to have infrastructure management to share data across and between IMWs
  - » Data management is a support structure concept and is needed for infrastructure
  - » Training for data management necessary, also agreements of standards (CA example)
  - » Should we invest in infrastructure management?

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