

# **Watershed and Aquatic Habitat Effectiveness Monitoring: A Synthesis of A Technical Workshop**

## **Executive Summary**

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Full report available at <http://www.fsl.orst.edu/imst>

## Executive Summary

On April 18 and 19, 2006, the Independent Multidisciplinary Science Team (IMST) and the Oregon Watershed Enhancement Board (OWEB) jointly convened a technical workshop in Corvallis, Oregon on effectiveness monitoring of aquatic habitat and watershed restoration activities. The immediate goal of the workshop was to create an opportunity for monitoring experts and practitioners (scientists, local watershed representatives, and resource specialists) to exchange ideas about effectiveness monitoring of restoration efforts. The longer-term goal for the workshop was to provide background material for the IMST to organize scientific information regarding effectiveness monitoring for ecological restoration activities. OWEB could then use that guidance to evaluate the effectiveness of its restoration programs and to better allocate resources to activities that further the goal of the Oregon Plan for Salmon and Watersheds. This report is a synthesis of the workshop discussions and will be the foundation of an independent report prepared by the IMST that will provide OWEB with:

- Pros and cons of various protocols and methods;
- Identification of broad information gaps and research needs;
- Concepts and tools for aggregating data and answering questions at larger scales; and
- Opportunities to increase scientific rigor, scope of inference, etc.

Four work groups were designated for breakout discussions based on broad categories of restoration objectives drawn from the 2003-2005 Oregon Plan Biennium Report<sup>1</sup> and lists of restoration projects, activities and objectives from OWEB's *Oregon Watershed Restoration Inventory*. Each work group was given the same set of questions aimed at addressing the State of Oregon's need to achieve scientific rigor in its effectiveness monitoring programs and to answer questions on restoration effectiveness at the basin, regional, and statewide scales.

The work groups found that focusing on individual project and activity types proved problematic and the work groups grappled with how to measure and determine overall effectiveness of project types without clear short- and long-term restoration goals and objectives. Participants indicated that an overarching restoration strategy is needed at the state level to provide context for the work occurring at local levels. Individual projects may be effective in some places but the participants felt that the real question was "Is the aggregation of all the smaller projects effective for the meeting the goals of the Oregon Plan?" Restoration needs to focus on long-term solutions that address natural processes and ecosystem functions not on short-term fixes that do not contribute to long-term solutions.

For the most part, work groups did not directly address the questions presented to them; however, several common issues were identified including:

- The terms "restoration", "effectiveness", and "effectiveness monitoring" have not been adequately defined and articulated as to what they mean to OWEB's program and to the Oregon Plan.
- Monitoring and restoration need to be integrated across disciplines and across landscape units of concern. Aquatic and terrestrial efforts need to be better integrated. Restoration

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<sup>1</sup> Oregon Watershed Enhancement Board (OWEB) 2005. 2003-2005 Oregon Plan Biennial Report, Volume 1. Oregon Watershed Enhancement Board. Salem, OR.

and monitoring designs are integrated, not separate processes. A strategic state-wide restoration and monitoring plan is needed. Restoration projects and activities include a “science element” as they each have null and alternative hypotheses. Effectiveness monitoring must be designed properly to determine which hypotheses should be accepted and which one should be rejected.

- Statisticians are needed to advise OWEB on experimental designs, sample sizes, and how to incorporate existing data sets into an effectiveness monitoring program. Designs need to address projects already in place as well as future projects. Statisticians should be brought into the process at the beginning not at the end when data are being analyzed.
- Geographical and temporal scale issues bring considerable difficulty to monitoring efforts, data analysis and interpretation. The technical and analytical tools for scaling small-scale project level data up to larger watershed scale are not yet available.
- Sufficient numbers of readily available control and reference sites are required for assessments and statistical analysis. Adequate baseline data are also needed and should be a required element in restoration and monitoring plans.
- Standardized data collection protocols and methods must be used; otherwise the data are not useful in integrated analyses of restoration effectiveness. Data management is also a critical component for monitoring.
- A centralized data center is needed to provide the means for sharing, integrating, and analyzing data. Linked databases need to be created that include information on watershed and site assessments, project restoration goals and objectives, procedures and methods used, data collected, data format, quality assurance and quality control procedures used, and reporting methods.
- Roles for agencies, watershed groups, OWEB grant holders, and others need to be determined and clearly articulated. State-wide and regional coordination of restoration and monitoring efforts is needed.
- Education and technology transfer needs to occur to provide technical assistance to watershed groups to provide them with the knowledge and skills to properly implement restoration activities, collect data, and conduct effectiveness monitoring so the data can be integrated at larger scales. Educating the public and policy makers on the importance of effectiveness monitoring is also needed.