

Addendum to Chapter 15B

Monitoring Program Implementation Summary: January 1998

In the broadest sense, the Oregon Plan Monitoring Program was designed and implemented to answer the following questions:

- *Is implementation of The Oregon Plan for Salmon and Watersheds contributing to a positive change in the productive capacity and resilience of Oregon's aquatic ecosystems? Key indicators are salmon population abundance and distribution and the maintenance of the cultural values and ecological processes dependent upon salmon.*

- *Is The Oregon Plan for Salmon and Watersheds promoting recovery of naturally reproducing populations sufficiently to insure that salmon species can persist in a variable natural and cultural environment? Indicators are sufficient species abundance across geographic and temporal ranges, as associated with habitats of sufficient quality, diversity, and spatial proximity.*

The Conceptual Framework for Monitoring, as articulated in the Steelhead Supplement, attempts to provide structure and integration of the monitoring tasks to address these questions. This summary follows the outline of that Conceptual Framework, highlights additional monitoring questions, and documents the current level of implementation.

The Monitoring Program was initially structured into 15 Tasks or project subject areas. A list of these Tasks and their current implementation status is in Table 1. As implementation has proceeded and as the Oregon Plan has been expanded to include additional species, and the scope of the work has increased accordingly.

The Monitoring Program is fully described in Chapter 16 of the March 10th, 1998 Oregon Plan **and** in Chapter 15B of the December 17th , 1998 Supplement I: Steelhead. To date, the Monitoring Program has focused work in the following areas:

- Implementation of specific measures and monitoring activities identified as Tasks in the Monitoring Plan
- Development of an organizational structure capable of meeting the goals and objectives of the Comprehensive Monitoring Strategy.
- Adoption of a Conceptual Framework for Monitoring Restoration Effectiveness and development of a Draft Charter for the Monitoring Group.
- Identification of new measures and expansion of existing monitoring activities to provide adequate monitoring of steelhead populations and their habitats.
- Technical support for watershed councils, landowners, and other groups participating in monitoring activities associated with the Oregon Plan.

Activities of the Monitoring Group and its participating agencies are structured by the conceptual framework into three major subject areas: Condition Assessment, Ecological and Cultural Trends, and Adaptive Management. The questions associated with each subject area, and the Tasks implemented to address these questions are below. **It will be a key function of the Monitoring Group including the Monitoring Issue Teams to provide integration across the tasks.** The questions listed under some of the Tasks are intended to provide a starting point for this process.

Condition Assessment:

What are the historical conditions, current status, and desired future conditions in the watershed that restorative actions can be measured against? What is the basis on which the monitoring program should measure recovery progress?

Task: Historical Reconstruction of Salmonid Abundance, Population and Habitat Organization

- *What disturbance patterns, geomorphology, and habitat conditions historically characterized Oregon ecoregions (or their subregions) and river basins?*
- *How are these disturbance patterns and habitat distributions expressed in the composition, production, and life-history patterns of salmonids historically present in these subregions and basins?*
- *Do coho “core” areas and steelhead “priority areas” correspond with historically productive “source” habitats within basins, and if not, what alternative restoration and protection priorities are required?*
- *What recovery strategies and ecosystem indicators are suggested by these historic patterns?*

Status:

- Historical reconstruction is now included as an activity in the Guidance for Watershed Assessment and the Draft Watershed Assessment Manual under development by GWEB with the assistance of the Watershed Assessment Monitoring Team.
- ODFW has made a new commitment to revision and evaluation of core areas and priority areas. This review will include examination of historic patterns of abundance.
- StreamNet support for the Oregon Plan includes effort to obtain historic information on habitats and populations and to make the information available to the Monitoring Team, watershed councils, and others.

Ecological and Cultural Trends:

What are the trends in productive capacities and resilience of Oregon’s aquatic ecosystems? What is the impact of management action compared to background levels

and variability in the natural systems? To what extent are observed natural and cultural trends a consequence of environmental change, restoration activities, or both?.

A. Indicators of Salmon Abundance and Survival:

Task 3: Juvenile Salmon Abundance Sampling

- *Are juvenile abundance and survival increasing within each Gene Conservation Group?*
- *Are there consistent geographic patterns in relative juvenile abundance or survival that can be attributed to environmental variations, habitat conditions, or levels of adult escapement?*

Status:

- Fully implemented at the scale of coho Gene Conservation Group and steelhead Ecologically Significant Unit. Plans for juvenile surveys are complete and funding secured. Implementation details are in Table 2 under Salmonid Population Monitoring.
- Additional sampling for juvenile distribution is supported by GWEB grants to watershed councils.
- Efforts to coordinate sampling are part of the monitoring team activities and will be included in the March Monitoring Workshop.

Task 5: Spawner Abundance Surveys

- *Is the abundance of wild salmonid spawners increasing or decreasing within each coho Gene Conservation Area Group and steelhead ESU?*
- *What is the relationship of spawner abundance to freshwater habitat conditions?*

Status:

- Fully implemented at the scale of coho Gene Conservation Group and steelhead Ecologically Significant Unit. Implementation details are in Table 2 under Salmonid Population Monitoring.
- Coordination between the spawner abundance project and the overall monitoring program will address abundance/habitat condition issues.

Task 9: Focus Sub-basin Monitoring of Habitat and Populations (Coho “Core Areas”, Steelhead “Priority Areas” and “Index Areas”).

- *Are differences in the production of salmon in selected index streams primarily due to survival differences in the freshwater or in the marine environment?*
- *Are the trends in freshwater and marine survival of salmon coupled or decoupled in western Oregon?*
- *Are there geographic differences in the patterns of relative freshwater and marine survival?*

- *Are geographic patterns of freshwater survival associated with differences in habitat quality?*
- *What are the relative rates of survival between hatchery stocks and wild populations?*
- *Do the Stratified Random Surveys provide accurate assessments of total escapement to a basin?*

Status:

- The implementation of 12-18 sub basin sites with both adult and smolt counting facilities provides the opportunity for integrated monitoring in these subbasins. Implementation is detailed in Table 2 under Salmonid Life History Monitoring and in Figure 1. Location of trapping facilities.
- ODFW, Dept of Forestry, DEQ, and Water Resources have agreed to support cooperative monitoring in these areas.

B. Indicators of Population and Habitat Organization:

Task 4. Stream Channel and Habitat Assessments

- *What are the status and trends in habitat quality within each Gene Conservation Group and ESU?*
- *Are trends in freshwater habitat quality reflected in trends in fish abundance and distribution?*
- *Are trends in habitat quality reflected in the geographic range and life-history diversity of salmonids?*

Status:

- Stream Channel and Habitat Assessments are funded and fully implemented, details are in Table 2 under Stream Channel/Riparian Inventory.
- Cooperative funding has expanded this effort in all coastal and interior steelhead ESU's

Need: Formal recognition of the process to integrate stream habitat assessments with salmonid abundance, genetic, and life history information.

Task 6: Genetic and Life History Monitoring

- *How do present life-history patterns in Gene Conservation Groups and ESU's compare with historical patterns (as inferred from historical reconstruction) and what are the implications of these results for habitat protection and restoration?*
- *Has implementation of The Oregon Plan increased genotypic and phenotypic diversity of salmonid populations?*
- *Are geographic patterns of life-history consistent with the patterns of population structure inferred from genetic analyses?*
- *Are the current boundaries of Evolutionarily Significant Units and Gene Conservation Groups supported by observed patterns of genetic and phenotypic diversity?*
- *Are hatchery and small wild populations at risk from genetic drift?*

Status:

- These questions are intended to be addressed by the Fish Population Team of the monitoring group. Additional resources to support this effort will be solicited as the team refined its objectives and as the new population and habitat information is accumulated.

Task 11: Estuary and Riverine Wetland Populations and Habitats

- *What are the status and trends in the quality and spatial organization of habitats in estuaries within each Gene Conservation Group?*
- *Are these habitat trends reflected in the life histories of juvenile salmonids?*
- *Are these habitat trends reflected in the abundance, growth, or survival of fish in selected (index) estuaries?*

Status:

- Additional effort to sample estuary habitats and evaluate restoration efforts are detailed in Table 2 under Estuary Monitoring
- Integration of estuary habitat evaluation, salmonid behavior, and predation effect

C. Indicators of Ecosystem Productivity

Task 2: Stream Biotic Condition and Ambient Water Quality.

The Oregon Department of Environmental Quality has two programs that address this issue, Ambient Water Quality Monitoring and the Index of Biotic Condition or Stream Condition Assessments.

- What level of stream quality is attainable by streams within each ESU?
- How effective have restoration or management measures been in enhancing and protecting stream quality?
- How do management measures need to be modified to meet stream quality objectives?
- What are the key streams or stream reaches within specific watersheds that need protection and enhancement?
- What are the major stream quality problems within specific watersheds?

Status:

- DEQ has funding to implement Ambient Water Quality Monitoring and Index of Biotic Condition in the coho GCS's and steelhead ESU's. Details are in Table 2 under Biotic Index Sampling.

D. Ocean and Climate Indicators

Task 10: Ocean and Climatic Conditions

- *What large-scale oceanic and atmospheric processes affect the productivity of freshwater, estuarine, and marine habitats of salmon?*
- *What physical and biological indicators provide an "early warning" of these*

processes for adapting management activities to climatic change?

- *Do restoration activities improve the capacity of salmon populations to withstand natural environmental fluctuations?*

Status:

- A workgroup has been established to provide information on ocean and climate conditions specific to the needs of the Oregon Plan. The Climate, Hydrology, and Ocean Studies (ChaOS) Team is led by George Taylor at Oregon State University.

Adaptive Management (Implementation-Evaluation-Modification):

General Implementation Monitoring: Accountability for agency implementation is documented in the Steelhead Supplement: Chapter 15A. Each agency provides monthly reports on their level of implementation.

Monitoring Group Tasks that support Adaptive Management:

Task 1: Stratified Probability Sampling Design. Development of integrated, statistically unbiased sampling designs has been actively implemented by the Quantitative Assessment Team.

Task 7. Fish Propagation Monitoring

- *Are the hatcheries efficiently meeting their management objectives?*
- *What are the relative risks of hatchery programs to ecosystems and native fish populations?*
- *Is hatchery introgression eroding genetic or phenotypic diversity of wild salmonid populations?*
- *Do hatchery releases adversely affect other native fishes in recipient streams?*

Status:

- ODFW has ongoing fish propagation monitoring and has committed to improved data management and access to information.

Task 8. Harvest Monitoring

- *What levels of fishery harvest are compatible with rebuilding wild salmon populations and restoring the productivity and resilience of Oregon ecosystems?*
- *Can selective fisheries be established to target hatchery fish with minimal impact on wild salmon?*
- *What are the effects of commercial and recreational fisheries on the distribution and biological characteristics (e.g., size, run timing, life-history diversity, etc.) of wild salmonid populations?*
- *What levels of escapement are necessary for Oregon streams to maintain their productivity?*

Status:

ODFW provides basic harvest monitoring changing .

Task 12: Forest Practices Monitoring ODF / NW Forest Plan Aquatic Conservation Strategy Monitoring.

Oregon Department of Forestry - Forest Practices Monitoring

Status: Funded and active. Summarized in Table 2 and in Steelhead Supplement.

Bureau of Land Management and US Forest Service Monitoring Programs

Status:

- Program and project support for stream channel assessments and cooperative monitoring of salmonid populations is active.
- NW Forest Plan Aquatic Conservation Strategy Monitoring is under development. Process has been assigned high priority for completion.

Task 14: Coordinate and Facilitate Monitoring: Evaluation of Restoration Projects and Actions.

Status:

- Oregon Plan Watershed Restoration Inventory fully funded and active with GWEB support.
- NMFS Seattle Science Center/BLM funding for evaluation of North Coast Restoration secured. Project scheduled to start in summer 1998.
- GWEB grant program support of watershed council and landowner monitoring activities (anticipates \$300-\$400 thousand dollars monitoring related support in 1998).
- Ongoing Monitoring Protocol development is responsibility of Monitoring Issue Teams. Progress and examples of protocols are in Chapter 15C of the Steelhead Supplement.

Task 15: Collect and Distribute Monitoring Results: Produce Annual Report.

Status:

- Monitoring Coordination occurs at monthly Monitoring Team meeting and more frequently as needed for specific projects.
- Support for Oregon Plan information access has been secured. StreamNet is providing web page development and data management support.
- Annual Report Outline complete.

Table 1. Monitoring Tasks in the Oregon Plan for Salmon and Watersheds as Implemented for Supplement I: Steelhead.

<u>Task</u>	<u>Status</u>	<u>Funding</u>	<u>Comments</u>
#1: Stratified Probability Sampling Design	Active: will implement integrated design for fish/habitat sampling in 1998.	Agency support for team members.	Participation from EPA, ODFW, DEQ, ODF. Need to develop methods for watershed councils.
# 2: Stream Biotic Condition and Ambient Water Quality Assessment	Active	Funded by Oregon Plan and Steelhead budgets.	Additional funding for eastern Oregon sites sought from federal sources
#3: Summer Juvenile Abundance	Active	Funded by Oregon Plan and Steelhead budgets.	Additional sites starting 1998.
# 4: Stream Channel and Habitat Assessments	Ongoing Active	Funded by Oregon Plan and Steelhead budgets w/ additional support from BLM, ODF, others.	Combination of priorities: unbiased stratified design, steelhead priority areas, underrepresented land use types
#5: Spawner Abundance Surveys	Ongoing Active	Funded by Oregon Plan and Steelhead budgets. NMFS funding for Rogue coho surveys ends 2/98	Expanded for coho, testing methods for steelhead, implementation for steelhead 98/99
#6: Genetic and Life History Monitoring	Under Development	(needs development)	Supported by task #9
# 7: Fish Propagation Monitoring	Ongoing	Existing	Ongoing
#8: Harvest Monitoring	Ongoing	Existing	Ongoing
#9: Focus Subbasins Salmon Core Area and Index Monitoring	Active/Expanding	Basic funding	12 to 18 subbasins w/adult & smolt monitoring
#10: Ocean Conditions Monitoring	Active	Outside funding	ChaOS Team Providing reports directly to Oregon Plan Implementation Team.

#11: Estuary and Wetland Populations and Habitats	Active in some areas – not comprehensive	Various grants and programs.	Integrated with predation studies funded in Steelhead Supplement. Ongoing
#12: Forest Practices/ Federal Watershed Assessments	Ongoing	Existing with additional support from Steelhead Budget – BLM directives GWEB	Special project supported by GWEB/USFWS grant with Monitoring Team review. Monitoring and Implementation Team leadership, additional positions.
#13: Cumulative Effects/Watershed Assessment for Mixed Ownership's	Active, Ongoing	Oregon Plan budget	Support from StreamNet, OSU, EPA, others.
#14: Coordinate and Facilitate Distributed Monitoring	Active, Ongoing	Support from various outside sources, need direct support for Oregon Plan position.	
#15: Info.Collection and Distribution: Produce Annual Report	Active, Ongoing		