

JOINT INTERIM TASK FORCE on SALMON RECOVERY

**SUMMARY of the SCIENTIFIC WORKSHOP on
MEASURABLE SALMONID RECOVERY CRITERIA**

JULY 1-2, 2002

Background

The recovery of depressed stocks of wild salmonids in Oregon is the primary goal of the Oregon Plan for Salmon and Watersheds. The Independent Multidisciplinary Science Team (IMST) was established by the Oregon Legislature in 1997 and advises the state on matters of science related to the Oregon Plan. In 1999, Governor Kitzhaber's Executive Order 99-01 expanded the scope of the Oregon Plan and specified that the IMST continue its role in the recovery of wild salmonids.

The IMST has made the defining and evaluating the recovery of Oregon Coastal Natural (OCN) salmon stocks a priority issue. In August 1999 the IMST convened regional leaders in salmon management and research in a workshop, *Goals for Recovery of OCN Stocks*, to explore definitions and criteria for evaluating the recovery of depressed coho stocks. The workshop participants focused on defining the concept of recovery and identifying criteria for evaluating recovery. The participants collectively identified the following characteristics or responses that are important for defining recovery:

- Survival of populations or stocks is insured:
 - Populations are self-sustaining through long periods.
 - Risk of extinction is low.
 - Populations are adequate to cause delisting under ESA.
- Salmon are sufficiently abundant to meet cultural uses.
 - Salmon provide visual experience for the public.
 - Salmon are available to support social traditions.
- Salmon are sufficiently abundant to meet economic and consumptive uses.
 - Salmon can support sport harvest.
 - Salmon can support commercial harvest.
- Ecological requirements are met across geographic range:
 - Population size
 - Productivity
 - Distribution
 - Diversity of life history types
 - Ecological functions of salmon in the ecosystem
 - Distribution of future habitats is suitable to sustain populations

At the same time, the workshop participants developed the following three draft recovery definitions:

- "Recovery" is the maintenance of diverse and productive freshwater habitat and sufficient natural spawners to produce self-sustaining levels of natural fish at maximum production levels over the long term. Maximum sustainable harvest or maximum sustainable production has been used to define such levels.

- A recovered population must be naturally self-sustaining over prolonged periods of poor climatic and environmental conditions at the level of basins or landscapes. The spawning and rearing habitat will be of sufficient quality and quantity to provide natural sustainability as well as substantial environmental, cultural, and economic benefits. Under all conditions, the population should be large enough and diverse enough at each life history stage such that:
 - spawning escapements reflect historical temporal and spatial distribution patterns,
 - genetic diversity is maintained, with the goal of preserving as many of the historically observed phenotypes as possible,
 - adult returns are adequate to fulfill necessary ecosystem functions.
- “Sustainability” is the most fundamental principle underlying salmon recovery. Wild fish must be sufficiently abundant, productive, diverse (in terms of life histories), and widely distributed that the resource as a whole is self-sustaining into the future. Recovered (self-sustaining) salmon populations should provide environmental, cultural, and economic benefits. However, consumptive benefits (from harvest) may limit the ability to achieve environmental/ecosystem benefits and non-consumptive cultural/economic benefits.

In December 2000 the IMST released Technical Report 2000-3, *Salmon Abundances and Effects of Harvest: Implications for Rebuilding Stocks of Wild Coho Salmon in Oregon*, which addresses five scientific questions and makes 16 recommendations. The first two recommendations are directed to the State of Oregon and the balance to the Oregon Department of Fish and Wildlife (ODFW). The first recommendation is:

The IMST recommends that the State of Oregon define in measurable terms what is meant by the “recovery” of depressed stocks of salmonids.

Without a measurable definition, there is no technical basis on which progress towards accomplishing the mission of the Oregon Plan can be assessed. This severely limits the application of the principles of adaptive management, and the prioritization of recovery and research initiatives. Criteria for recovery need to incorporate demographic and genetic factors. A scientific workshop may be helpful in developing these criteria.¹

Based on this recommendation, the 2001 Legislative Assembly enacted House Bill 3002, which created the Task Force on Salmon Recovery, which is directed to define recovery and to establish criteria for salmon recovery.

House Bill 3002 (2001) created a 13 member task force that has three primary directives:

- Define recovery for purposes of restoring anadromous salmonid populations to a point at which the populations may be removed from endangered and threatened status under the federal Endangered Species Act of 1973;
- Develop and coordinate a scientific workshop with the IMST; and
- Establish criteria for evaluation of salmon recovery.²

¹ Independent Multidisciplinary Science Team, *Salmon Abundances and Effects of Harvest: Implications for Rebuilding Stocks of Wild Coho Salmon in Oregon*, Technical Report 2000-3, December 15, 2000.

² HB 3002 became effective August 8, 2001. The measure was sponsored by the House Committee on Stream Restoration and Species Recovery, Rep. Bob Jenson, Chair.

In preparation for a scientific workshop, the Salmon Recovery Task Force developed a working definition of recovery to assist and facilitate the workshop discussions. The task force referenced the three draft definitions of “recovery” developed by the participants of the previous IMST workshop and developed the following definition:

A recovered population is sustainable at the level of basins or landscapes over prolonged periods of poor ocean, climatic, and environmental conditions. The spawning and rearing habitat will be of sufficient quality and quantity to provide natural sustainability of fish populations and associated environmental, cultural, and economic benefits. Wild fish must be sufficiently abundant, productive, diverse in terms of life histories, and widely distributed that the resource as a whole is self-sustaining into the future.

On July 1 and 2, 2002, a scientific workshop was held at the LaSell’s Stewart Center, Oregon State University. The task force and the IMST invited legislators, regional scientists, state, federal, and tribal experts, and other professionals engaged in salmon recovery. The participants of the scientific workshop are listed below. This summary attempts to reflect the context and discussions; however it does not necessarily conclude consensus from all participants.

Fred Allendorf	University of Montana
Chris Beasley	Columbia River Inter-Tribal Fish Commission
Ed Bowles	Oregon Department of Fish and Wildlife
Mary Buckman	American Fisheries Society
Mark Chilcote	Oregon Department of Fish and Wildlife, Salmon Recovery Task Force Member
Tom Cooney	National Marine Fisheries Service (NMFS)
Doug Cramer	Portland General Electric
Jackie Dingfelder	Oregon State Representative
Ian Fleming	Oregon State University
Stan Gregory	Oregon State University, IMST
Jim Hall	Professor Emeritus of Fisheries, Oregon State University
Selina Heppell	Oregon State University
Bob Jacobson	Salmon Recovery Task Force, Chair
Bob Jenson	Oregon State Representative
Katy Kavanagh	University of Idaho
Robert Lackey	US Environmental Protection Agency
Jim Lannan	Professor Emeritus of Fisheries, Oregon State University, Coastal Oregon Marine Experiment Station
Pete Lawson	National Marine Fisheries Service (NMFS)
Ted Lorenson	Oregon Department of Forestry, Salmon Recovery Task Force Member
Paul McElhany	National Marine Fisheries Service (NMFS)
Kelly Moore	Monitoring Coordinator, Oregon Watershed Enhancement Board (OWEB)
Jim Myron	Oregon Trout, Salmon Recovery Task Force Member
Jay Nicholas	Oregon Watershed Enhancement Board (OWEB), Salmon Recovery Task Force, Vice-Chair

Tom Nickleson	Oregon Department of Fish and Wildlife
Logan Norris	Oregon State University
Bill Pearcy	Oregon State University, IMST
Gordie Reeves	U.S. Forest Service
Carl Schreck	Oregon State University, IMST
Andre Talbot	Columbia River Inter-Tribal Fish Commission
Karen Tarnow	Oregon Department of Environmental Quality (DEQ), Salmon Recovery Task Force Member
Tom Wainwright	National Marine Fisheries Service (NMFS)
Robin Waples	National Marine Fisheries Service (NMFS)

Scientific Workshop Framework and Contents

The workshop began with an overview of the purpose and charge of HB 3002 (2001), Oregon Plan context, and the IMST, Oregon Department of Fish and Wildlife (ODFW), and National Marine Fisheries Service (NMFS) interest and expectations of the workshop's focus.

Agency Overviews

Ed Bowles, Fish Division Manager, ODFW commented in support of defining recovery and the importance of identifying measurable criteria in the evolution of the Oregon Plan. Mr. Bowles expressed Oregon's commitment to obtaining and maintaining fish sustainability. He noted that the crafting of a recovery definition will provide a goal for fish management trends and in establishing a level of stability. The department asserted the importance and necessity of NMFS and the United States Fish and Wildlife Services (USFWS) being active players in these discussions and in the final determination of the recovery definition. Mark Chilcote presented an overview of ODFW's Lower Columbia River Coho Recovery Plan and Tom Nickelson reviewed the Oregon Coastal Natural Coho habitat-based life cycle model.

Stan Gregory, IMST, summarized previous efforts and other scientific endeavors addressing salmonid recovery and measurable criteria. He acknowledged that the workshop is an opportunity to itemize, solidify and expand previous recommendations.

Paul McElhany and Robin Waples, NMFS, reviewed the agency's activities and goals during the 1990's, the 2001-2002 recovery planning efforts, and the Technical Recovery Team (TRT) report. The TRT is organized around specific geographic areas with the goal to develop individual plans for all listed Evolutionarily Significant Units (ESUs) within each specific area. NMFS asserted that the workshop is an opportunity to discuss and address a variety of challenging technical issues involved with salmonid recovery.

Workshop Discussion

To provide a starting point, the task force identified four general factors that characterize salmonid stocks: abundance and distribution; and productivity and diversity. However, it was recognized that these general factors required further defining through measurable criteria. To that end, the workshop participants were divided into three break-out groups and on Monday, July 1, discussed abundance and distribution and on Tuesday, July 2, productivity and diversity to identify possible criteria and data that might support their use.

The break-out groups summarized and presented the topics identified in their sessions to the full group. During the full group discussion, areas of agreement and areas to be considered were acknowledged: *communication to the public, definitions, measurable criteria, and new ideas and ideas to be considered*

Communication to and with the public

Different people want different things from Oregon's ocean, rivers, riparian areas, and flood plains. Through various social processes these desires are expressed as public values. The articulation and discussion of diverse goals and values is needed to achieve success in salmon recovery. Public commitment and participation in the recovery process is imperative. Workshop participants outlined and offered the following areas for consideration:

- Variability of populations; because of variability, there is an inherent trade off between time and certainty, social decisions regarding acceptable levels of risk, and the acceptable amount of time to achieve this level;
- Time required to understand status, expectations for the assessment, and delisting process;
- Abundance is not the only criteria to be considered –factors are inter-related;
- Rules that apply for abundance may not apply to the whole ESU;
- Clearly define population, sub-population, and ESU;
- Develop and explain existing terms for public understanding and the importance of the diversity;
- Maintain the focus on who the end-users are, explain terms in a way that will have meaning (for example: how does the term “sustainable population” relate to the public?);
- Recognize and acknowledge cultural perspectives (wild vs. hatchery); and
- Recognize low level of understanding of the existing stressors.

Definition

The IMST has identified that the definition of recovery should include measures that are both ecologically important and socially meaningful to the public. Carefully measured and well communicated results of salmon restoration are important in the efforts to boost public participation. The salmon recovery participants agreed with these statements and recommended that the definition of “recovery”:

- Be reconciled with existing statutes to guarantee consistency and clarity and be consistent with the federal Endangered Species Act (ESA);
- Provide footnotes or additional definitions of language meanings ;
- Include a footnote or definition of “sustainable” and that a discussion be held of what are allowable levels of human intervention ;
- Be clear regarding the difference (if any) between recovery and delisting;
- Be clear that spawning and rearing habitat does not always capture other critical elements, such as estuaries and/or migration routes;
- Be cautious in the using of the term basin or landscape – clarity is necessary to provide precise meanings of each;
- Be clear with the language “resource as a whole”;
- Establish whether recovery is dependent upon natural systems and natural sustainability versus systems with human interactions (for example, is trap and haul consistent? Is artificial production consistent? By pass systems?);
- Should the definition include what would be useful to how and what degree of human interaction is allowed or acceptable;
- Be cautious in using ocean and climatic environmental conditions; and

- Should the definition be tied to poor ocean conditions? Suggests stronger language— a statement that measures what is in place to off set environmental conditions and conditions that may cause dramatic decline of populations.

Measurable Criteria for Evaluating Recovery

Salmonid stocks are characterized by their abundance, productivity, population structure, demographic independence, geographic distribution, and genetic structure. During the previous IMST workshop, the participants identified and concluded that the most effective measures that could be related to criteria for recovery were subsets of the following factors:

1. Abundance
2. Productivity
3. Spatial and temporal structure
4. Diversity
5. Ecological functions

The salmon recovery workshop participants identified a similar framework. With general agreement, the following six criteria were acknowledged as possible elements in measuring recovery:

- Criterion 1.** *Viable population size (corresponds with abundance and ecological structures)*
- Criterion 2.** *Proportion and distribution of viable populations in ESU (corresponds with spatial and temporal structure)*
- Criterion 3.** *Spawner replacement (corresponds with productivity)*
- Criterion 4.** *Proportion of sampled streams with zero spawners (corresponds with spatial and temporal structure)*
- Criterion 5.** *Diversity – genetic and life-history*
- Criterion 6.** *Amount and quality of habitat types (corresponds with spatial and temporal structure)*

If the above criteria are to be adopted and considered for the monitoring and assessment programs, the salmon workshop participants submitted the following points for consideration:

- Use existing data and population viability model (PVM) to establish threshold;
- Multiple models; if they indicate consistent patterns → increase confidence – if inconsistent patterns → raises questions
- Data gathering model output
 - ↓ ↓
 - are thresholds being establishes threshold
 - met?
- Diversity may be more applicable at the population level;
- Do not add more information in an effort to maintain simplicity;
- The question, if ‘no continued loss of diversity’ wouldn’t remove the incentive to reestablish populations in areas where the populations have decreased?
- Improve fresh water conditions – questions if spawner replacement is sufficient
- Monitor fresh water and ocean conditions separately;
- Definition of diversity – genetic, habitat, phenotype (run timing, disease resistance and smolt timing);
- Suggested the development of three recovery stages: a) in trouble; b) in recovery; and c) recovered; and

- Question regarding how Criterion 4 would be measured and that #4 could be included as a subset of Criterion 2.

Ideas to be Considered - Open Discussion

Each participant was asked if there was a statement or comment they wanted to add for the record. The following are some of their statements:

- Recovery is not just getting to a number or population size, it is about variability;
- First determine if the population is viable, then move into the ESU;
- Consider habitat quality – impact on distribution, productivity and population, hot spots – populations are expressions of habitat;
- How long is the population sustained? Timeline issue;
- Abundance of naturally producing fish is the only measurable criteria that matters – that is what the public sees
- Once delisting is achieved, the evaluation of the criteria remains in place;
- In determining the criteria, maintain awareness of fiscal impact;
- The Salmon Recovery Task Force could determine the priorities vs. recommendations;
- Comments that Criterion 4 addresses distribution, requires additional clarification – should be broad to reflect distribution.
- Concerned raised about the task force’s ability to arrive at actual recovery numbers to meet HB 3002 requirement;
- Important to develop delisting criteria, but in many cases that may be a while off. In the meantime develop guiding principles, interim goals, such as no loss of diversity;
- Time frame is critical – time frame for measuring population, for detecting recovery and for hitting recovery;
- Need right mix of measures/criteria e.g. if we use shorter timeframe, need to increase certainty about resiliency;
- The distinction between accessible and inaccessible habitat quality needs to be addressed;
- Timeframe is critical and contingent upon factors being looked at. What is being evaluated is the stock diversity management and diversity of life history types. Need to look at variability in recruitment, etc.;
- Tribal restoration plan goals are 25 year goals. Need to look at where we are and growth rate needed to get to the goal. In many cases, productivity rates unattainable with only natural systems given current conditions. Supplementation needs to be considered to achieve necessary rates. Need very good estimates of productivity to meet goals;
- Abundance of naturally produced fish is the only measurable criteria that is going to matter, because other factors will occur with high abundance;
- Need to describe abundance over a period of time;
- Matrix could address where ocean conditions dominates vs. freshwater conditions dominates;
- Need some criterion that measures habitat;
- Criteria s/d come from science, but decisions must address cost, time, labor, etc.;
- Concern about overemphasis on population without looking/evaluating the big picture and the work being done;

- Important to begin delisting process rather than only focusing on criteria. All elements are important, but don't get lost in the fine tuning; and
- Encourage the state to develop scenarios of future Oregon landscapes if we are to accomplish goals of the Oregon Plan then take existing models of Coho salmon populations and evaluate the difference for those populations and what affect/impact those efforts would have.

Findings and Conclusions

Although the workshop was titled "Workshop on Measurable Salmonid Recovery Criteria" the participants also discussed and refined elements that the task force will use in drafting the definition of recovery. The points that have remained consistent between the previous IMST workshop and the salmon recovery workshop are:

1. The explicit definition of recovery and criteria for evaluating population status and trends is essential for successful implementation and the forward movement of the Oregon Plan for Salmon and Watersheds.
2. The definition of recovery should insure long-term viability of salmon populations. Recovery is not complete until production is adequate to provide social, cultural, and economic benefits.
3. The definition of recovery requires coordination with existing statutes to guarantee consistency and clarity.
4. The definition of recovery should include measures that are both ecologically important and socially meaningful to the public.

References

Independent Multidisciplinary Science Team (IMST). 2000. Salmon Abundances and Effects of Harvest: Implications for Rebuilding Stocks of Wild Coho Salmon in Oregon. Technical Report 2000-3 to the Oregon Plan for Salmon and Watersheds. Oregon Watershed Enhancement Board. Salem, Oregon.

Independent Multidisciplinary Science Team (IMST). 1999. Defining and Evaluating Recovery of OCN Coho Salmon Stocks: Implications for rebuilding stocks under the Oregon Plan for Salmonids and Watersheds. Technical Report 1999-2 to the Oregon Plan for Salmon and Watersheds. Governor's Natural Resources Office. Salem, Oregon.