

**Independent  
Multidisciplinary  
Science Team  
(IMST)**



**State of Oregon**

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April 28, 2005

The Honorable Ted Kulongoski  
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The Honorable Peter Courtney  
Oregon Senate President  
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The Honorable Karen Minnis  
Oregon House Speaker  
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Please find enclosed the 2004 Annual Report of the Independent Multidisciplinary Science Team (IMST) for the Oregon Plan for Salmon and Watersheds and the 2005 Administrative Report compiling responses to recommendations made by the IMST from October 2000 through December 2004. The IMST is sending these reports to you, the appointing authority for the IMST, and copies to the House Committee on Water, the Governor's Natural Resources Office, and the Oregon Watershed Enhancement Board.

The Annual Report summarizes the activities of the IMST for 2004, including technical and letter reports to state agencies, and briefings and presentations made to the IMST and by IMST members. During 2004, the IMST completed a major report on Oregon's water temperature standards, the effects elevated water temperatures may have on salmonids, and how land uses may affect water temperatures. The IMST also continued work on two major land use reports: Urban and Rural Residential Land Use, and Eastern Oregon Resources. In addition, the IMST has continued to provide an independent, unbiased review of science issues related to the Oregon Plan to state agencies and the people of Oregon.

During 2004, the IMST also devoted a considerable amount of time working with new and long-term IMST members and the House of Representative's Interim Agriculture and Natural Resources Subcommittee on Water to better clarify how the Team operates and the State's expectations for the IMST. The IMST also discussed the 2004 technical report on the Oregon's water temperature standards with the Interim Subcommittee and the Oregon Plan's Core Team to address legislative and special interest groups' concerns about the content and scope of the report.

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April 28, 2005

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The 2005 Administrative Report compiles responses received to recommendations made by the IMST since October 2000. The IMST has reviewed and evaluated responses received before January 1, 2005. The evaluation of responses were done over the past four years as responses were received by the IMST. In general, agency responses have been positive and adequate. The interactions between the IMST and agency staff about these recommendations have also been good.

We believe that people and the State of Oregon, its citizens and agencies, have made great progress toward recognizing the importance of watershed restoration and of recovery of depressed stocks of salmonids. The challenge of the Oregon Plan is to persist over the long term, even though the State is faced with new and important challenges. We believe this long-term effort is essential to ensure that freshwater habitats improve so that they will sustain viable populations of salmonids when ocean conditions, which have been very favorable during the last several years, again become unproductive. The quality and availability of fresh water in Oregon are also critical to meet the needs of society.

We will be glad to discuss these reports and any related issues with you, if that would be helpful.

Sincerely,



Nancy Molina  
IMST Co-Chairs



Carl Schreck

cc:

Mike Carrier, GNRO

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IMST

# **Evaluation of Responses to IMST Recommendations**

**Administrative Report 2005-1**

**A report of the  
Independent Multidisciplinary Science Team,  
Oregon Plan for Salmon and Watersheds**

**April 28, 2005**

**Citation:** Independent Multidisciplinary Science Team. 2005. Evaluation of Responses to IMST Recommendations. Administrative Report 2005-1 to the Oregon Plan for Salmon and Watersheds. Oregon Watershed Enhancement Board. Salem, Oregon.

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## Introduction

Oregon Revised Statute 541.409, which created the IMST, specifies that agencies are to respond to the recommendations of the IMST, stating “(3) If the Independent Multidisciplinary Science Team submits suggestions to an agency responsible for implementing a portion of the Oregon Plan, the agency shall respond in writing to the team explaining how the agency intends to implement the suggestion or why the agency does not implement the suggestion. The Team shall include any agency responses in its report to the Joint Legislative Committee on Salmon and Stream Enhancement”.

For this reason, the IMST has explicitly identified its suggestions as recommendations and has directed them to specific agencies. The recommendations of the Team are included in Technical Reports, Letter Reports and letters. They deal with technical and scientific matters that the Team feels are important for the Oregon Plan. In this report we are including letter reports and technical reports produced by the IMST from October 2000 through 2004. Evaluations of responses to earlier recommendations were included in our 2000 Administrative Report and Addendum. As with the 2000 Administrative Report, we briefly evaluate each response and indicate if scientific and technical perspectives strongly suggest additional consideration of the recommendation. We understand that there may be matters of policy or other issues that make it impossible or undesirable to implement a specific recommendation of the Team. Our purpose in suggesting reconsideration of some recommendations is not to argue against specific policy or management decisions, but to ensure that the technical and scientifically based consequences of the decisions are clearly understood.

In the material that follows we (a) state the recommendation of the IMST, (b) summarize the agency response to it, and (c) give our evaluation of the response. We conclude by indicating whether or not additional consideration of the recommendation is warranted. Each response was assigned to one of four general categories: adequate, intermediate, inadequate or indeterminate.

- Adequate means that the IMST supports the decision of the agency.
- Intermediate means that the IMST does not fully support the agency decision because the decision will decrease the likelihood of accomplishing the goals of the Oregon Plan in a timely manner, but not doom it to failure. We note our concerns but stop short of suggesting that the recommendation be reconsidered.
- Inadequate means that the IMST feels the decision by the agency will seriously detract from achieving the goals of the Oregon Plan and the IMST strongly suggest that the decision be reconsidered.
- Indeterminate means that we can not tell what the agency decided to do with the recommendation, or that we do not have enough information to fully evaluate their response. As a secondary conclusion, indeterminate is used to indicate that while the initial actions are positive the long-term effectiveness of the actions is unknown.

The material is organized by the report or letter from which the recommendation came. The responses to recommendations were reviewed and evaluated over a 4-year period and involved different IMST members as some appointments have ended and new ones have begun. The IMST has worked to maintain consistency in the evaluations. Several responses had been

received in January and February 2005 and have not yet been evaluated. These and any revised responses from agencies will be included in an Addendum to this report.

From October 2000 through 2004, the IMST has made 86 recommendations in 7 technical and letter reports. The Team has received responses to 80 of recommendations. In general, the responses received were positive and found to be adequate (40%), however, a large number of responses have been indeterminate (28%), in that they did not provide the Team with sufficient information to determine what the agency decided to do with the recommendation or how the decision may affect the success of the Oregon Plan. Inadequate responses accounted for 17% of the responses. Another 15% of the responses received by the IMST are in the process of being evaluated.

**IMST Evaluation of responses to recommendations made in the  
10/25/00 Letter to Kay Brown, ODFW, regarding the scientific review of ODFW's Coastal  
Salmonid and Willamette Hatchery Program Review  
(referred to as Hatchery Audit in report)**

**Recommendation 1: Develop a strategic plan for the management of hatcheries to be consistent with the goals of the Oregon Plan for Salmon and Watersheds.**

**ODFW response:** ODFW agrees with the recommendation and feels that their proposed *Hatchery Management Policy and Guidelines* (ODFW December 14, 2001 Draft) will provide the strategic plan for hatchery management in Oregon. ODFW cites section III 2 of the draft: "Hatchery programs under the oversight of ODFW will be managed to provide optimum fishery and conservation benefits, consistent appropriate Oregon Fish and Wildlife Commission directives, the Oregon Plan for Salmon and Watersheds, fish management plans, permits, agreements and the best available scientific information".

**IMST conclusion:** *Indeterminate.* While ODFW agrees with this recommendation, it is not readily apparent how they will comply. They indicate that the *Hatchery Management Policy and Guidelines* "will provide for the strategic plan. However, while this is an excellent document presenting a *policy* and *guideline*, it does not present a strategic plan necessary for implementing that policy.

**ODFW November 26, 2002 response to IMST conclusion:** ODFW provided more detailed information on how the agency will develop strategic plans for the management of hatcheries through the implementation of the Native Fish Conservation and Hatchery Management Policies.

**IMST conclusion:** *Adequate.*

**Recommendation 2: Develop a strategy for evaluating hatchery performance that includes assessing the performance of fish outside of the hatchery (survival of hatchery fish from smolt to adult).**

**ODFW response:** ODFW agrees with this recommendation saying all current smolt release groups of hatchery reared chinook and coho have representative subgroups of coded wire tagged individuals so that smolt to adult survival rates can be determined. The data is also used to assess fisher contribution rates to ocean and freshwater sports and commercial fisheries. Some steelhead smolt release groups also have sub groups of coded wire tags to determine smolt to adult survival rates.

**IMST conclusion:** *Adequate.* ODFW agrees with this recommendation.

**Recommendation 3: Develop a strategy for the assessment of the impact of hatchery released fish on the performance, production and survival of naturally spawning wild stocks of fish.**

**ODFW response:** ODFW’s proposed *Native Fish Conservation Policy and Guidelines* (ODFW December 14, 2002 Draft) outlines processes to attempt to assess the impact of hatchery reared fish on wild stocks. Updated watershed management plans will be used to develop river basin management goals and actions within scientific sideboards. Hatchery Genetic Management Plans are also being developed for each stock of hatchery reared fish which address interactions with wild native fish. ODFW also plans to implement long term monitoring and evaluation programs to evaluate management actions and provide a basis for adaptive management.

**IMST conclusion:** *Adequate.* The *Native Fish Conservation Policy and Guidelines* and *Hatchery Genetic Management Plans* are being developed and outline a strategy to assess impacts of hatcheries on wild stocks. Implementation of these policies and plans, as well as monitoring programs and adaptive management, will be essential to evaluate these programs.

**Recommendation 4: Include direct and indirect costs in cost benefit analysis**

**ODFW response:** Depending on the type of analysis being conducted, ODFW states that they agree with this recommendation. As an example they explain “for state funded programs it could be argued that the indirect costs are the same for all the programs, so when programs are being compared to each other then the direct cost of operating the specific programs at the different hatcheries are used in the analysis”. Further they say that indirect costs are more nebulous than direct costs and can be more difficult to quantify. The analyst(s) would determine including indirect cost in an economic analysis depending on the type and purpose of the cost benefit analysis.

**IMST conclusions:**

- *Indeterminate.* ODFW appears to agree in part with this recommendation. The response focuses on *indirect costs* in calculation of monetary budgets.
- *Inadequate.* Assigning and calculating indirect costs can be very complex and open-ended. Perhaps we were not explicit enough, but the IMST also intended to refer to indirect costs associated with a project or program resulting in ancillary environmental or resource harm. “Costs” in this sense implies cost to the resource. For example, a fishery targeting hatchery fish in a mixed stock fishery could result in over-harvest of a sensitive wild stock; there can thus be a large biological as well as fiscal cost associated with that activity. IMST’s intent was that ODFW capture the spirit of this notion, not necessarily the details, even if the specifics vary from case to case.

**ODFW November 26, 2002 response to IMST conclusion:** The Oregon Secretary of State is working on an audit report titled “Oregon Department of Fish and Wildlife: Hatchery Cost Effectiveness – State Fiscal Years 1994 – 1997”. The report will include monetary indirect costs of hatchery operations. The conservation plans noted in ODFW’s response to Recommendation 1 would include an assessment of the primary limiting factors affecting a population within a

species management unit and identify factors that can be influence by management. This process will identify if a hatchery program is a limiting factor to natural salmonids that should be changed to bring about a significant increase in the naturally produced native fish in the species management unit.

**Recommendation 5: Develop and use a consistent method for (a) evaluating the degree of straying of hatchery fish onto natural spawning beds and (b) assessing the impacts on wild stocks:**

**ODFW response:** ODFW states that they agree with this recommendation and intends to use the best available scientific information and methods to evaluate straying of hatchery fish onto natural spawning beds and their impacts on wild stocks. Implementation of management actions, evaluations and research projects (as referred to in the *Native Fish Conservation Policy and Guidelines*) will be consistent with funding and staffing availability and priorities.

**IMST conclusions:**

- *Adequate.* ODFW will use the best available science.
- *Indeterminate.* IMST's recommendation was not directed at a *consistent* approach relative to funding and staffing. Rather, we recommend that ODFW develop and implement methods for evaluation of straying and impacts that are *consistent* between watersheds and between hatchery programs. If or how this will be accomplished was not addressed in ODFW's reply. No detail or methodology was provided, and while ODFW refers to the *Native Fish Conservation Policy and Guidelines*, that policy has as yet not been adopted, and it does not identify explicit methods.

**ODFW November 26, 2002 response to IMST conclusion:** ODFW responded that the agency has not yet developed explicit methods for evaluating straying and the impacts on native fish for all watersheds statewide. They further say that for anadromous fish, spawning ground surveys are likely to be a primary tool for evaluating straying. They go on to expand how straying surveys for hatchery coho and chinook salmon would differ from surveys on steelhead. The agency also listed and briefly explained programs they have in progress to determine impacts of hatchery fish on wild fish and the work being done at the time to create a hatchery research center that will be on the Fall Creek Hatchery grounds in the Alsea River basin.

**IMST Evaluation of responses to recommendations made in  
Salmon Abundances and Effects of Harvest: Implications for Rebuilding Stocks of Wild  
Coho Salmon in Oregon  
Technical Report 2000-3**

**Recommendation 1: The IMST recommends that the State of Oregon define in measurable terms what is meant by the “recovery” of depressed stocks.**

**State of Oregon response:** No formal response has been received from the State. In 2001, the State Legislature passed House Bill 3002 Section 18 which established a Salmon Recovery Task Force charged with defining “recovery for purposes of restoring anadromous salmonid populations to a point at which the populations may be removed from endangered or threatened status under the federal Endangered Species Act of 1973. The Task Force completed their work and forwarded a definition to the State Legislature in 2002.

**IMST conclusion:** *Adequate*

**Recommendation 2: The IMST recommends that the State of Oregon provide the legislative and executive support to enable ODFW to adopt the use of an explicit analytical process as part of the decision process for harvest levels. Further, we recommend that ODFW use the results from the analytical process in representing the State of Oregon to the PFMC.**

**State of Oregon response:** No response received

**ODFW response:** No response received.

**IMST conclusions:** *Inadequate*. The IMST feels that this is a critical step for managing OCN coho and still needs to be addressed by the State of Oregon.

**IMST Recommends that the Department of Fish and Wildlife:**

**Recommendation 3: Evaluate the ability of the current monitoring and research programs to provide data required for life-cycle modeling and to measure the following:**

- **Recolonization of habitats as stocks recover**
- **Straying Rates**
- **Distribution and abundance of spawners across the range**
- **Degree of unoccupied habitats, and**
- **Ocean survival (both within and among Gene Conservation Groups (GCG’s)).**

**ODFW response:** The current monitoring program ODFW has on the Oregon Coast has three components that address the needs identified above: 1) the EMAP-based Salmonid Inventory Project which estimates coho distribution and abundance at the GCA and basin scales; 2) the

Western Oregon Rearing Monitoring Project, which monitors juvenile coho distribution and abundance at the GCA scale, and; 3) the Life-Cycle Monitoring Project, which estimates freshwater and marine survival at seven coastal site and one lower Columbia River site. The agency indicated that it is not clear what the IMST meant by straying rates. If this is the percentage of a population that does not return to natal streams to spawn, then the research is not being conducted because of the size of the task. If this refers to the percentage of the naturally spawning population that are strays from hatcheries, then these estimates are being made by the Salmonid Inventory Project and has been facilitated by the marking of all hatchery fish released in coastal basins.

**IMST conclusion:** *Adequate*. The IMST endorses the development of life-cycle monitoring sites. We continue to encourage the State to consider future efforts to determine straying rates for wild fish. This is an important mechanism for recolonizing streams as populations increase in the future.

**Recommendation 4: Strengthen life-cycle modeling.**

*And*

**Recommendation 5: Strengthen extinction-risk modeling.**

**ODFW response:** ODFW is not sure how the IMST is differentiating between the life-cycle model and the extinction-risk model. The agency sees them as one, and the same, as published by Nickelson and Lawson (1989) which describes the application of a habitat-based life-cycle model to the question of population viability of Oregon coastal coho. Efforts since the original development of the model has been making it more spatially explicit, developing relationships that will allow the incorporation of hatchery impacts and preliminary sensitivity analysis. In addition, the model has been used to identify critical population levels for the harvest matrix. Preliminary work has also been done on a sensitivity analysis.

**IMST conclusions:** Inadequate. One model is the performance of the fish, their abundance and distribution, and the other is the risk that the fish could be come extinct and certain assumptions are made about the performance of the fish at minimum population sizes, etc. So they are related but are not the same. Although preliminary sensitivity analyses are being conducted, the State needs to put it a higher priority to make sure that the models are robust. The preliminary work is not sufficient. IMST realizes that population modeling and risk of extinction modeling are high priorities. We advise the State to dedicate an explicit program to this ongoing effort.

**Recommendation 6: Adopt harvest management strategies that reduce fishery impacts on OCN coho salmon to as close as possible when survival and spawner abundances are at critically low levels (OCN Work Group Report 2000) until established signs of recovery are observed. ODFW should advocate this same position to PFMC.**

**ODFW response:** In a January 4, 2002 letter, ODFW indicated that in response to proposed federal listings of Oregon Coast and Southern Oregon/Northern California ESUs under the Endangered Species Act the State of Oregon initiated the Oregon Plan. Concurrently the PFMC

began to consider a 13<sup>th</sup> amendment to their Salmon Fishery Management Plan that would insure that fishery related impacts would not act as a significant impediment to the recovery of depressed OCN stocks. The harvest management portion of the Oregon Plan formed the basis for changes in the Council's management of ocean fisheries and became the template for Amendment 13. The matrix in Plan Amendment 13 are consistent with the IMST recommendation and includes constraints on harvest rates to incidental levels in the range from 0 to 8% when parental spawner and marine survival levels are at critically low levels.

The PFMC adopted the revised harvest management matrix as technical guidance in October 2000 and expressed intent to incorporate it in the Salmon Fishery Management Plan (FMP) upon development of the next amendment. The federal process is underway (Amendment 15 to the Salmon FMP) and is scheduled for completion in 2005 (Melcher 2005)<sup>1</sup>.

**IMST Conclusion:** *Indeterminate*. While ODFW did participate as part of the OCN Work Group that made recommendations to the PFMC, there is no indication if the PFMC will adopt and incorporate those recommendations or how ODFW will advocate for them beyond the Work Group.

**Recommendation 7: Advocate to PFMC that new criteria be incorporated into the matrix of Amendment 13 to include “very low” OCN coho salmon parent spawner abundance and “very low” marine survival.**

**ODFW response:** In a January 4, 2002 letter, ODFW responded that recommendations made by the OCN Work Group regarding harvest management matrix in Plan Amendment 13 are consistent with IMST's Recommendation 7. The OCN Work Group recommended to the PFMC that they should include new “very low” parental spawner and marine survival categories.

The PFMC adopted the revised harvest management matrix as technical guidance in October 2000 and expressed intent to incorporate it in the Salmon Fishery Management Plan (FMP) upon development of the next amendment. The federal process is underway (Amendment 15 to the Salmon FMP) and is scheduled for completion in 2005 (Melcher 2005)<sup>1</sup>.

**IMST Conclusion:** *Indeterminate*. While ODFW did participate as part of the OCN Work Group that made recommendations to the PFMC, there is no indication if the PFMC will adopt and incorporate those recommendations or how ODFW will advocate for them beyond the Work Group.

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<sup>1</sup> Melcher, C. 2005. Oregon coastal natural coho harvest management in ocean and in-river fisheries. January 31, 2005 draft for the Oregon Coastal Coho Assessment, State of Oregon, Salem. Report available at (last accessed April 12, 2005): <ftp://rainbow.dfw.state.or.us/oregonplan/Reports/Agency%20Reports/ODFW/ODFW%20Harvest%20PECE%20Report.pdf>

**Recommendation 8: Develop harvest management criteria that include consideration of the distribution of spawners and the percentage of streams or basins with viable populations of spawners within sub-aggregate units. ODFW should advocate this position to PFMC.**

**ODFW response:** In a January 4, 2002 letter, ODFW indicated that when the PFMC OCN Work group drafted their review of Plan Amendment 13 the consensus opinion among the members was that the increased precautions that were included in the new harvest matrix precluded the necessity of criteria at any scale finer than the subaggregate level (OCN coho are split into four subaggregates). In retrospect, ODFW has concluded that the “major basin” trigger should be reinstated. ODFW concurs with the IMST recommendation and have concluded that the “major basin” provision addresses the important issue of maintaining a diversity of viable spawning populations within sub-aggregates. ODFW will advocate that the provision be included in the technical appendix to the OCN Work Group report that will be submitted to the PFMC in March 2002.

**IMST conclusion:** *Adequate*. ODFW basically agrees with the IMST and suggest that their subbasin or sub-aggregates criteria do just that and provide distribution. From a landscape point of view, what they are proposing here is adequate. However, the OCN Work Group did include spatial distributions in the minimum sustainable escapement and the IMST encourages ODFW to adopt that for OCN coho coast-wide.

**Recommendation 9: Use the Minimum Sustainable Escapement (MSE) concept to augment the use of harvest impacts in estimating harvest related OCN coho mortality. ODFW should advocate this position to PFMC.**

**ODFW response:** In a January 4, 2002 letter, In a January 4, 2002 letter, ODFW responded that recommendations made by the OCN Work Group regarding harvest management matrix in Plan Amendment 13 are consistent with IMST’s Recommendation 9. The OCN Work Group recommended to the PFMC that they embrace the MSE concept by triggering very conservative harvest levels to minimize extinction risk for stock when parental spawners are “critical” and marine survival is “extremely low”.

The PFMC adopted the revised harvest management matrix as technical guidance in October 2000 and expressed intent to incorporate it in the Salmon Fishery Management Plan (FMP) upon development of the next amendment. The federal process is underway (Amendment 15 to the Salmon FMP) and is scheduled for completion in 2005 (Melcher 2005)<sup>2</sup>.

**IMST conclusion:** *Indeterminate*. On one hand the State recommended this change. On the other hand, it recommended it to be advisory and PFMC adopted the harvest management matrix in Amendment 13 as guidance. We encourage the State to work with PFMC to establish a permanent harvest matrix with provisions for critically low populations.

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<sup>2</sup> Melcher, C. 2005. Oregon coastal natural coho harvest management in ocean and in-river fisheries. January 31, 2005 draft for the Oregon Coastal Coho Assessment, State of Oregon, Salem. Report available at (last accessed April 12, 2005): <ftp://rainbow.dfw.state.or.us/oregonplan/Reports/Agency%20Reports/ODFW/ODFW%20Harvest%20PECE%20Report.pdf>

**Recommendation 10: Adopt a decision process that enhances recovery over longer periods of time and includes consideration of the spatial distribution of stocks. ODFW should advocate this same position to PFMC.**

**ODFW response:** In general ODFW agrees with the long-term recovery concepts embodied in this recommendation but they do not agree in every case with specific criteria proposed along with this recommendation. ODFW included an explanation of their agreements and disagreements with criteria listed by the IMST.

- The new “critical” parental spawner category in the revised harvest management matrix proposed by the OCN Work Group effectively addresses the need for a “defined Minimum Sustainable Escapement”. Spawner spatial distribution was discussed in detail with response to IMST Recommendation 8.
- Long-term recovery is also inherent in the new management matrix proposed by the OCN Work Group. Harvest rates in the matrix are predicated upon both parental spawner abundance and marine survival experienced by subsequent progeny. These are both measured, not forecasted parameters.
- Even the total elimination harvest impacts cannot insure recovery of OCN coho populations when marine survival is “extremely low”. When marine survival is “extremely low” or “low” and parental spawners are at any level other than “critical”, minor incidental harvest impacts (0-11%) may actually result in slightly higher improved recruitment because of density dependent effects in freshwater rearing areas.
- As part of Recommendation 10, the IMST has suggested that stock must achieve greater than 1:1 spawner to spawner replacement for each brood year over three brood cycles before a change in harvest rate can be triggered. It is not clear to ODFW how this criteria results in increased probability for long-term recovery of OCN coho beyond what is already provided for in the revised Plan Amendment 13 management matrix. Failure to achieve replacement at the subaggregate level is largely a function of marine survival. The new harvest management matrix already effectively eliminates harvest management as an impediment to recovery when marine survival is poor.

**IMST conclusion:** *Inadequate*. ODFW indicates that meeting a 1-to-1 spawner replacement is a function of marine survival. The IMST disagrees, it is not just a marine survival issue it is also a function of freshwater habitat. ODFW did not address the temporal aspect of maintaining the 1-to-1 spawner replacement over three recent brood years—a nine year period. Year-to-year management decisions need to be done in respect to three-year brood cycles, multiple generations, and related uncertainties when moving from poor ocean conditions to good ocean conditions.

**Recommendation 11: Link decisions on ocean harvest to the status of the weakest stock component. Advocate that PFMC use this same approach.**

**ODFW response:** In a January 4, 2002 letter, ODFW indicated that the OCN Work Group recommended to the PFMC that management decisions should be predicated upon the performance of the weakest sub-aggregate. Similar to the harvest management matrix in

Amendment 13, the expanded matrix proposed by the OCN Work Group divides the coast-wide aggregate of OCN stocks into North, North Central, South Central, and Southern sub-aggregates based on geographic proximity and genetic similarities among contributing populations. Management decisions that would originate from the matrix are predicated upon the performance of the weakest sub-aggregate.

The PFMC adopted the revised harvest management matrix as technical guidance in October 2000 and expressed intent to incorporate it in the Salmon Fishery Management Plan (FMP) upon development of the next amendment. The federal process is underway (Amendment 15 to the Salmon FMP) and is scheduled for completion in 2005 (Melcher 2005)<sup>3</sup>.

**IMST conclusion:** *Indeterminate*. The agency basically agrees with recommendations and is working to achieve the recommendation; however the overall outcome and effectiveness are unknown.

**Recommendation 12: Determine the relationship between the response of salmon juveniles and their food webs to carcass abundance and distribution, and determine the processes by which these relationships operate.**

**ODFW response:** The agency agrees that research is needed to establish the relationship between nutrients obtained from salmon carcasses and the response of juvenile salmon, particularly since ODFW does have carcass placement programs in place. However, they feel that this type of research has been ongoing in Washington and is typically more suited for the university environment. The agency will stay up to date on information emerging in this area and implement results from new research as possible.

**IMST conclusion:** *Inadequate*. ODFW does have a good research teams; but whether or not it is done by ODFW or universities, the research needs to be done. ODFW could request and assist an outside research group to conduct the studies, particularly since ODFW does have carcass placement programs.

**Recommendation 13: Advocate that PFMC obtain more accurate estimates of hook-and-release mortality of OCN coho salmon to better assess the impacts of the fishery.**

**13a. Support PFMCs review of hook-and-release mortality**

**13b. Continue and expand double-index tagging of hatchery fish during years when selective coho fisheries are implemented.**

**13c. Continue monitoring of the encounter and retention of marked and unmarked fish in any selective fisheries (e.g., Buoy 10, the Ocean Recreational, terminal fisheries for fish released from net pens in the Columbia River estuary).**

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<sup>3</sup> Melcher, C. 2005. Oregon coastal natural coho harvest management in ocean and in-river fisheries. January 31, 2005 draft for the Oregon Coastal Coho Assessment, State of Oregon, Salem. Report available at (last accessed April 12, 2005): <ftp://rainbow.dfw.state.or.us/oregonplan/Reports/Agency%20Reports/ODFW/ODFW%20Harvest%20PECE%20Report.pdf>

**ODFW response:** ODFW concurs with Recommendation 13a and states that ODFW is an active participant in the most recent review of hook and release mortality results conducted by the Salmon Technical Team of the PFMC and continues to support further research in that area.

Recommendation 13b suggests that ODFW continue and expand double index tagging of hatchery fish during years when selective fisheries were implemented. We concur that double index tagging must continue at some level to insure continuity of the tradition coded-wire tag program but they do not concur that the methodology will contribute to better estimates of hook and release mortality in selective fisheries and point to a paper written by Dr. Shijie Zhou of ODFW that has more recently been published in the North American Journal of Fisheries management<sup>4</sup>.

ODFW also concurs with Recommendations 13c and 14. Agency monitoring programs have been required annually for selective fisheries in the ocean waters off the coast of Oregon. ODFW has maintained a strong commitment to this requirement and has conducted detailed monitoring for ocean selective fisheries every year since their inception in 1998. ODFW included a list of recommendations in their letter response and indicated which objectives meet Recommendation 13c.

**IMST conclusions:**

- *Adequate.* ODFW agreed with supporting the continued the review of hook and release mortality and supports further monitoring of encounter and retention of marked fish to attain more accurate estimates, but ODFW does not agree that increasing double index tagging would continue to better estimates of hook and release mortality.
- *Indeterminate.* The IMST would like to have a statistician review the double-index-tagging report by Dr. Zhou before making a final evaluation of ODFW's response.

**Recommendation 14: Continue to determine compliance rates with respect to release of unmarked coho salmon.**

**ODFW response:** ODFW also concurs with Recommendations 13c and 14. Agency monitoring programs have been required annually for selective fisheries in the ocean waters off the coast of Oregon. ODFW has maintained a strong commitment to this requirement and has conducted detailed monitoring for ocean selective fisheries every year since their inception in 1998. ODFW included a list of recommendations in their letter response and points out which objectives meet Recommendation 14.

**IMST conclusion:** *Adequate.*

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<sup>4</sup> Zhou, S. 2002. Uncertainties in estimating fishing mortality in unmarked salmon in mark-selective fisheries using double-index-tagging methods. North American Journal of Fisheries Management. 22: 480-493.

**Recommendation 15: Manage all wild coho salmon in Oregon---lower Columbia River, north coast, central coast, and south coast stocks---under the same principles and with the same goals. ODFW should advocate this same position to all entities with whom they collaborate in the management of coho salmon stocks.**

**ODFW response:** ODFW is not sure exactly what the IMST means in stating that “There is no scientific basis for treating lower Columbia coho salmon separately from coastal coho salmon”. To the contrary, NMFS Biological Review Team identified coho populations from the lower Columbia River and southwest Washington coast as an ESU. Stocks in this ESU were identified as having demonstrable differences from OCN coho with respect to genetic traits, life history and stock productivity characteristics, and geographical distribution. In 1999, the Oregon Fish and Wildlife Commission listed the lower Columbia River coho as an endangered species under the State’s endangered and threatened species law. In compliance with that law, ODFW has prepared an endangered species management plan that also includes biological benchmarks for recovery and delisting and long-term management goals. In the plan, fishery impacts on wild lower Columbia River coho populations in ocean and freshwater fisheries are managed independently. From a management perspective, the management plan for lower Columbia River coho is very consistent with IMST recommendations in that it applies similar management trigger points to those used for OCN coho and sets harvest rates with the same longer recovery goals in mind.

**IMST conclusion:** *Adequate*. Everything that ODFW is implementing is consistent with the recommendations.

**Recommendation 16: Tag all hatchery coho in the Columbia River. ODFW should advocate this same position to all co-managers in the Columbia River basin (e.g. State of Washington, Tribes and federal agencies), and also determine from Pacific States Marine Fisheries Commission (PSMFC) the number of untagged fish that have adipose fins.**

**ODFW response:** ODFW does not find it clear why the IMST contends that failure to mark 100% of hatchery releases will introduce bias into estimates of harvest impact to wild fish in selective fisheries, mark rates of less than 100% do result in decreases precision around those estimates. From an analytical perspective, ODFW does concur that marking 100% of hatchery fish is a desirable goal but recognize the expense that would be incurred by management agencies in order to achieve it. ODFW is also very sensitive to and respectful of Tribal cultural biases against mutilation marks and hook and release fisheries.

**IMST conclusion:** *Adequate*. The IMST continues to encourage ODFW to work with co-managers to increase the percentage of hatchery fish that are marked. Hatchery and wild fish may act differently in the ocean and differential mortality from harvest could occur. Having a higher percentage of hatchery fish marked could also decrease the number of hatchery fish mistakenly released as wild fish. These released hatchery fish could compete with wild fish in freshwater habitats and spawning grounds.

**IMST's Evaluation of Responses to Recommendations made in:  
The Scientific Basis for Artificial Propagation in the Recovery of Wild Anadromous  
Salmonids  
Technical Report 2001-1**

**Recommendation 1. ODFW should develop a comprehensive plan/cohesive policy for hatchery management.**

**ODFW response:** ODFW's proposed Hatchery Management Policy and Guidelines (ODFW December 14, 2001 Draft) is intended to be the State's comprehensive plan for future hatchery management. The document is intended to guide fisheries managers in developing specific management objectives, hatchery objectives, habitat improvements, harvest management and other appropriate strategies through the development of watershed management plans and hatchery and genetic management plans.

**IMST conclusions:**

- *Adequate.* The *Hatchery Management Policy and Guidelines* (HMPG) have been developed.
- *Indeterminate.* The HMPG is not a specific plan; rather, it sets the sideboards for development of a comprehensive plan for hatchery management. The IMST recommends the development of a comprehensive plan for hatchery management consistent with the HMPG. The plan should identify the purpose of each hatchery and how that purpose relates to the Oregon Plan on a state-wise basis. Given individual hatcheries have individual operation plans, IMST's recommendation is that ODFW develop a plan and/or policy leading to a review and adaptation of all of the individual plans collectively to produce an integrated program addressing Oregon Plan needs.

**Recommendation 2. ODFW should adapt and incorporate the recommendations of the independent science panels into statewide comprehensive policy.**

**ODFW response:** ODFW reviews and considers the conclusions and recommendations of all science panels and intends to always use the best science when developing state policies. State policies also undergo public and scientific review before being adopted into administrative rule or policy by the Oregon Fish and Wildlife Commission.

**IMST conclusion:** *Adequate.* ODFW is complying with this recommendation. It would have been useful if ODFW had listed some recent examples of recommendations that that agency had adapted or at least considered for adoption.

**Recommendation 3. ODFW should tie the operation of hatcheries to explicit, measurable management objectives.**

**ODFW response:** ODFW agrees with this recommendation stating the ODFW Basin Plans and revised watershed plans in the future will have specific management objectives for hatchery programs within the watershed.

**IMST conclusion:** *Adequate.* ODFW basin and watershed plans in the future will include specific management objectives for hatchery programs .

**Recommendation 4. ODFW should implement the recommendations made in IMST’s Workshop on Conservation Hatcheries and supplementation in the assessment and revision of supplementation programs.**

**ODFW response:** ODFW will work closely with co-managers to implement recommendations made in the workshop. The main points made in the workshop were to make good assessments of the need to supplement a fish population, evaluate the risks and benefits of supplementation, to determine and use the appropriate methods for supplementation and to conduct the proper monitoring and evaluation to determine the success of the program.

**IMST conclusion:** *Adequate.* ODFW will implement the recommendations.

**Recommendation 5. ODFW should incorporate the landscape perspective into hatchery management.**

**ODFW response:** ODFW agrees with the recommendation and feels that it is the intent of watershed management plans to incorporate hatchery management into the landscape perspective with input from local watershed users and inhabitants.

**IMST conclusion:** *Inadequate.* ODFW intends to use watershed management plans as the vehicle for meeting this recommendation. These stop at the watershed boundary. There is no mention of how landscape-related aspects (i.e., those that may span two or more watershed) will be addressed. Relying on input from local users and inhabitants suggests that only locally available information will be used, hence plans will be at the local and not landscape level. Contribution of hatcheries to the Oregon Plan requires a landscape perspective. Similarly, consideration of issues relevant to ESU’s, gene conservation groups, etc., requires a view that spans watersheds.

**Recommendation 6. ODFW should initially give priority for change from hatchery specific to the landscape perspective consistent with the direction of this report to coastal and Lower Columbia system hatchery programs.**

**ODFW response:** ODFW agrees with this recommendation and will prioritize the development of watershed management plans.

**IMST conclusion:** *Inadequate.* Although ODFW will prioritize implementation of hatchery programs in coastal and lower Columbia River among watershed management plans, the plans should be inclusive of multiple watersheds. As in Recommendation 5, ODFW does not address multiple watersheds in their response. In addition, what ODFW means by “prioritize development of watershed management plans” is unclear. Does this give development of some

plans priority over the development of other plans, or the prioritization of some information within watershed plans (an “adequate” response would include a description of how is ODFW changing priority from hatchery-specific perspectives to those based on a landscape perspective?).

**Recommendation 7. ODFW should support and participate in collaborative research efforts to determine the consequences of interactions between hatchery and wild fish.**

**ODFW response:** ODFW states that they support and participate where possible in research efforts to answer scientific questions regarding fish interactions and other knowledge that will lead to the scientific knowledge base regarding conservation programs.

**IMST conclusions:**

- *Adequate.* ODFW supports research directed at the interactions between hatchery and wild fish.
- *Indeterminate.* ODFW indicates it participates in collaborative research directed at the interactions between hatchery and wild fish, but there is no information indicating the nature of this collaboration. A list of titles of collaborative research efforts, for example, could fulfill this need.

**Recommendation 8. The IMST should convene a workshop to clarify the state of knowledge on the differences between hatchery and wild fish and the implications to supplementation programs and the fitness of naturally spawning populations.**

**IMST response:** The IMST held a three day workshop on *Conservation Hatcheries and Supplementation Strategies for Recovery of Wild Stocks of Salmonids* in Portland, Oregon on June 19-21, 2000. Invited workshop participants included federal, state (including ODFW, Washington and Idaho), tribal, university (including U. of British Columbia, U. of Montana, U. of Alaska, U. of Minnesota, Oregon State U.) scientists and hatchery managers, and members of the IMST. The IMST issued a report from the workshop:

IMST. 2000. Conservation Hatcheries and Supplementation Strategies for Recovery of Wild Stocks of Salmonids: Report of a Workshop. Technical Report 2000-1 to the Oregon Plan for Salmon and Watersheds. Oregon Watershed Enhancement Board, Salem, OR.

**Recommendation 9. ODFW should strengthen monitoring and evaluation of hatchery programs.**

**ODFW response:** Monitoring and evaluation programs will be designed to adequately measure progress toward hatchery program objectives, contain risks within acceptable limits and provide feedback for adaptive management.

**IMST conclusion:** *Indeterminate.* While ODFW clearly agrees with the spirit of this recommendation, how the recommendation will be met is not considered. Will the hatchery-monitoring program be consistent with the *Oregon Plan Monitoring Program Strategy* that is being finalized? How will the evaluation of hatcheries be strengthened?

**Recommendation 10. ODFW should establish an explicit process for adaptive management that makes effective use of the results from monitoring programs.**

**ODFW response:** ODFW responds that they agree with the recommendation and that monitoring and evaluation programs will be developed consistent with the collaborative process described in the Native Fish Conservation Policy and Guidelines (ODFW December 14, 2001 Draft). These programs will use standard scientific procedures on an appropriate schedule and scale to measure progress toward objectives and impact on wild fish populations and ecosystems. Monitoring and evaluation programs will be coordinated among existing programs and institutions, and incorporated into funding and management processes in a timely manner for effective adaptive management.

**IMST conclusions:** *Inadequate.* ODFW points to their *Native Fish Conservation Policy and Guidelines* (NFCPG) as providing the guidance for development of monitoring and evaluation programs. However, while the NFCPG alludes to adaptive management, there is nothing in that document that explicitly establishes or discusses a *process* for conducting adaptive management. A *process* is needed that feeds back the results of monitoring efforts into a centralized, coordinated program that fosters management decisions and recommendations based on the best available information and eliminates fragmented use of state management programs.

**IMST Evaluation of responses to recommendations made in the  
7/31/02 Letter to Governor John Kitzhaber, Senate President Gene Derfler, and House  
Speaker Mark Simmons, regarding the scientific review of OWRRI's 1995 report entitled  
"Gravel Disturbance Impacts on Salmon Habitat and Stream Health"<sup>5</sup>**

**Recommendation 1. The Oregon Plan Core Team should develop a statewide policy on the management of stream sediments and bedload transport.**

**Core Team Response:** No response was received directly addressing if a policy will be developed. The Core Team did address several sub-bullets the IMST had listed on elements that could be part of a statewide policy.

**IMST conclusion:** *Inadequate.* The CORE Team response fails to address the recommendation, which was to "... develop a statewide policy...". The IMST intended for the above statement to be the main recommendation and the bullets were meant to be possible components of a statewide policy. We do not find that the Core Team addressed the primary point of developing a statewide policy, while they did consider each bullet we do not know if they agree that a policy is appropriate and if so what steps they would take to create one. IMST believes that the CORE Team missed the overall objective of the recommendation. We request that the Core Team reevaluate the recommendation above.

**The IMST did evaluate each bulleted element to which the CORE Team responded.**

- **Identify one agency to have oversight on all floodplain and in-stream mining operations.**

**Core Team Response:** While the Core Team believes this concept has merit, a consolidated program should have expertise in the disciplines relevant to fluvial geology and geomorphology, mining and fisheries and riparian biology, including disturbed site reclamation. A good model might be the Federal coal regulatory program. The coal program leads to consolidated permitting, and an integrated, multidisciplinary approach to project review. Consolidated permitting inspection and enforcement under one roof could lead to improved consistency over what we have now. In Oregon, consolidating all floodplain and in-stream mining into one agency would require Legislative action affecting at least three agencies. While the Core Team supports better agency coordinating, gaining the necessary political support to accomplish this task may be difficult and will take time.

**IMST conclusion:** *Inadequate.* IMST recognizes that difficult changes in policy and gaining legislative approval exist in implementing this policy element. However, the response fails to directly address the recommendation and to state what changes DSL and DOGAMI could immediately undertake through inter-agency coordination or through an Executive Order by the Governor.

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<sup>5</sup> IMST member, Rich Shepard, abstained from adopting Team evaluations of the Core Team responses.

- **Provide the means for the State to conduct impact analysis for stream systems, not just for individual operations.**

**Core Team Response:** The Core Team agrees that this would provide important data long overdue. Practically it faces several hurdles. It is likely too costly for any individual mining operation to bear. Also, in the opinion of many, it would likely support only minimum amounts of gravel available to be extracted. Therefore it is unlikely we will see much data as a result of proposed in-stream mining. However there is much that could be gained from such information, particularly if the State looks at landscape approaches from the center of the channel to the upper limit of the one hundred year floodplain. Opportunities to fund pilot projects that collected data on significant reaches of different morphologic types of rivers over time would be valuable for restoration projects.

**IMST conclusion:** *Inadequate.* IMST reviewed the 1995 OWRRI report on “Gravel disturbance impacts on salmon habitat and stream health, Vols. 1 and 2” where the same issue of stream sediment budgets and research was addressed. IMST still strongly believes that landscape management of gravel operations is preferable to individual site-by-site management and continues to support the OWRRI recommendation. IMST reminds the CORE Team that there are other reasons than salmonid needs to justify a sediment budget analysis including watershed function and future economics. As mentioned in our 2002 letter report, significant decreases in bedload material can cause significant increases in erosion rates which can undermine infrastructures such as bridge pilings and affect personal properties.

Sustainable resource management requires that the state know how much of a resource is available and the rates it is “renewed” and environmental factors that can affect renewal rates. Instream aggregate management should operate on the same basic assumptions that are used in managing other renewable and non-renewable resources. Additionally, the Department of Land Conservation and Development’s Goal 5 indicates that mineral and aggregate resources will be inventoried and that “the conservation of both renewable and non-renewable natural resources and physical limitations of the land should be used as the basis for determining the quantity, quality, location, rate and type of growth in the planning area”. Inventories should include not just how much and where, but constraints for how much is available now and in the future. While IMST agrees with the CORE Team that the “...cost may be too costly for any individual mining operation to bear”, it may be more practical for the state to conduct such assessments in key watersheds and seek funding from several sources. The state is responsible for regulating use of aggregates.

- **Manage sediments trapped behind dams and mitigate for sediment-poor stream sections below dams.**

**Core Team Response:** From a biological perspective, this recommendation may make sense. Sorting sand and gravel at dams could replenish lower reaches of dam-controlled streams, but the Core Team questions whether this is a feasible concept. Perhaps a pilot project undertaken in association with the relicensing of an existing hydroelectric project should be

considered. This seems like an issue for the Federal Energy Regulatory Commission and the US Army Corps of Engineers to consider.

**IMST conclusion:** *Indeterminate*. The IMST recognizes that this is a difficult process, however, the CORE Team response does not attempt to identify circumstances where the recommendation would be feasible. While Federal dams are under the control and administration of Federal agencies, such as the US Corp of Engineers, the State is a “Co-Manager” of Federal dams run under FERC and the USCE and can influence these dams operations. In addition, the State has great influence over state- and privately-owned dams.

- **Incorporate elements of the National Marine Fisheries Service’s National Gravel Extraction Policy (NMFS 1996).**

**Core Team Response:** The Core Team has recently reviewed the current NOAA Extraction policy and those comments are attached. Many of the elements are presently being incorporated by state agencies. The Oregon State of the Environment Report 2000 identified significant gaps in current information about riparian systems. A broad scale analysis of riparian resources would provide a framework for looking at floodplain function. That analysis, coupled with site specific analysis of floodplain stratigraphy and an inventory of mining sites, would provide the basis for a stronger understanding of the role of mining in affecting aquatic ecosystems.

**IMST conclusions:** *Indeterminate*. IMST is unable to determine what is meant by the second sentence of the CORE Team response, “Many of the elements are presently being incorporated by state agencies.” A lack of specifics hindered our conclusion. Also the overall response appears to be unclear as to what CORE Team action is being recommended or undertaken.

- **Based on final commercial product, determine priority levels of aggregate mining from within channels and active floodplains. The State could encourage use of products that do not require the high quality sorted aggregates from channels and are more likely to occur in areas that are more suited for reclamation or mitigation. Other sources may include reservoir deltas, dredger tailings, inactive river terrace deposits, upland quarries, and recycling of aggregates (Kondolf 1998).**

**Core Team Response:** Certainly, to date, the market has controlled the use and distribution of aggregates. Overall, less and less material is coming from in-stream sources with the majority of material coming from the floodplain and upland sources. The Core Team believes that encouraging a different distribution would face significant challenges. In some areas of the state, particularly on the coast, in-stream aggregate is much higher quality than aggregate derived from the upland basalts. A marketing and economic feasibility study would be required to fully evaluate the assumptions contained in this particular IMST recommendation. Funding would be required to undertake such a study and it is not apparent where those funds would come from.

**IMST conclusions:** *Inadequate.* The point of the IMST recommendation was directed towards instituting a State policy, not towards the economics of gravel mining and aggregate quality sources.

- **Reflect changing land-use practices that may affect future sediment inputs to streams, which in turn, may affect the availability of commercial aggregates.**

**Core Team Response:** As mentioned above, in-stream production is decreasing over time and floodplain and upland sites make up the difference. The agencies are currently working with OSU, PSU, the agriculture and aggregate industries and others to compile data that will better explain current use by land use practice. The Core Team hopes this project will lead to some decisions that will help maximize the opportunities suggested in this policy recommendation.

**IMST conclusions:** *Indeterminate.* IMST believes that the CORE Team has misunderstood the point of this bullet and IMST may be partially at fault in its wording. This part of the Recommendation was directed towards land-use priorities and uses that could control or affect the production of aggregates in the future. It appears that the CORE Team interpreted the bullet to be directed towards the demand or availability of aggregates.

**Recommendation 2. DSL should develop and integrate a basin level approach into its management policies.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**Recommendation 3. DSL should determine sediment budgets and bedload transport rates on stream reaches with permitted aggregate mining operations.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST..

**Recommendation 4. DSL should track the actual amount of aggregate removed by permit holders.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**Recommendation 5. DSL, in cooperation with ODFW, should assess the cumulative impacts of aggregate mining on streams with declining salmonids.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**Recommendation 6. DSL should increase the technical expertise of geomorphology and hydrology within the agency.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**Recommendation 7. ODFW and DSL should identify critical salmonid migration routes not currently protected under the *Essential Indigenous Salmonid Habitat* (ORS 196.810(b); OARS 141-102-0000 thru 0040) designation where impediments to migration may be occurring due to removal-fill activities.**

**Recommendation 7a. The Land Board and DSL should provide protection for critical salmonid migration routes identified by ODFW and DSL.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**ODFW Response:** None received to date

**Recommendation 8. DSL and ODFW should develop and effectiveness monitoring program to determine if permit conditions under the Removal-Fill Law and General Authorizations maintain and protect salmonid fish habitat including gravel substrate, fish populations, and riparian conditions.**

**ODFW Response:** None received to date

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**Recommendation 9. The State Land Board and DSL should develop an adaptive management process that is linked to the effectiveness monitoring program.**

**State Land Board Response:** None received to date

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses have not yet been evaluated by the IMST.

**Recommendation 10. DSL should incorporate both the technical aspects of the 1995 report, *Gravel Disturbance and Impacts on Salmonid Habitat and Stream Health*, prepared by Oregon Water Resources Research Institute into their operations and policies, and the recommendations in this report.**

**DSL Response:** DSL responded to recommendations in a February 1, 2005 letter. The responses are in the process of being evaluated by the IMST.

**IMST's Evaluation of Responses to Recommendations made in:  
Recovery of Wild Salmonids in Western Oregon Lowlands  
Technical Report 2002-1**

**Recommendation 1.** The Core Team of the Oregon Plan for Salmon and Watersheds should develop and implement a landscape approach to manage salmonid habitat in western Oregon lowlands.

**Recommendation 2.** The Core Team of the Oregon Plan should develop and implement a statewide riparian policy and plan that provides for proper function and condition of riparian areas in Oregon.

**Recommendation 3.** The Core Team of the Oregon Plan should develop a statewide policy and plan for the management of large wood in and near streams and estuaries.

**Core Team Response:** The Core Team responded to the recommendations in a letter dated January 12, 2005. The responses are in the process of being evaluated by the IMST.

**Recommendation 4.** The Oregon Watershed Enhancement Board (OWEB) should develop strategic priorities for protection and restoration activities in western Oregon lowland streams, rivers, and estuaries to enhance salmonid recovery.

**OWEB Response:** Based on workshop discussions in July 2002, OWEB has allocated funds to develop a pilot effort to identify regional restoration priorities and has identified the lower Columbia and Hood River basins as pilot regions. OWEB has contracted with a consultant to gather information from watershed assessments, and other analyses of water quality, stream flow, and aquatic habitat issues in each region to prioritize restoration activities.

**IMST Conclusions:**

- *Adequate.* OWEB's initial efforts described in their response are promising and we encourage further development of the programs.
- *Indeterminate.* As these are pilot programs, we are unable to determine their long-term implementation and overall success and how such activities can be applied to other lowland systems and estuaries.

**Recommendation 5.** The Division of State Lands (DSL) should reconnect main river channels to off-channel areas and floodplains to increase available lowland habitat for salmonids.

**DSL Response:** DSL responded to recommendations in an April 15, 2005 letter. The responses are in the process of being evaluated by the IMST.

**Recommendation 6. The Oregon Department of Fish and Wildlife (ODFW) should determine fish abundance and establish fish-habitat relationships in western Oregon lowland rivers, streams, and estuaries.**

**ODFW Response:** ODFW agrees with the recommendation but notes that more funding would be needed to implement it. The agency states that their current EMAP program provides a framework and some of the information necessary to improve understanding of fish-habitat relationships in lowland streams and rivers. ODFW is exploring their ability to redesign existing habitat surveys to include broader sampling schemes. The agency also plans to include more estuaries in their research for comparison with habitat relationships found for the Salmon river.

**IMST Conclusion:** *Adequate*. ODFW's response is positive and the current and proposed work they are doing in lowland and estuarine systems is promising and we encourage them to explore new opportunities to learn more about fish-habitat relationships in these systems.

**Recommendation 7. The Oregon Watershed Enhancement Board (OWEB) should implement a long-term systematic monitoring strategy to evaluate the status and trends of salmonid populations, the capacity of habitat to produce salmonids and support diverse salmonid life histories, and the effectiveness of protection and restoration. The strategy should represent the diversity of land uses and aquatic ecosystems in western Oregon lowlands.**

**OWEB Response:** OWEB has developed and implemented a monitoring strategy for the Oregon Plan Monitoring Program and agrees with all the aspects of monitoring listed with the recommendation. The OWEB Board has approved funding for assessing riparian vegetation and coastal and tidal wetlands. OWEB has also developed a draft Monitoring Implementation Plan based on their strategy.

**IMST Conclusions:**

- *Adequate*. OWEB's overall monitoring strategy is an excellent framework for the Oregon Plan Monitoring Program and provides a means to put monitoring projects in perspective.
- *Indeterminate*. It is unclear exactly how OWEB will implement this recommendation and the overall effectiveness of the monitoring efforts.

**Recommendation 8. Oregon Department of Agriculture (ODA) and Oregon Department of Environmental Quality (DEQ) should establish the effects that land use activities in western Oregon lowlands have on salmonid populations and habitat quality.**

**ODA Response:** ODA agrees that integration of information on salmonid habitats is important and that they will pursue it to the best of their ability. ODA does not currently have the resources or directives to collect data on water quantity, flow regimes, aquatic habitat, fish passage and screening, or large wood abundance and distribution. ODA is authorized to develop an agricultural water quality management program that focuses on agricultural conditions that affect water quality. However, ODA's monitoring program deals with the relationship between land

condition (e.g. riparian conditions and plant cover) and water quality conditions such as temperature.

**DEQ Response:** DEQ has a long-term ambient monitoring site monitoring effort (< 20 years of data) for water quality in the Willamette River mainstem and its major tributaries. DEQ also samples wadeable streams in the Willamette Valley for parameters such as physical habitat, water chemistry, and macroinvertebrate and fish assemblages. The agency has begun to analyze the correlations between water quality and land uses in the vicinity of the ambient monitoring sites and is seeking support to continue analyzing the data and to determine what information can be determined from the present monitoring sites. Presently, DEQ's biomonitoring database does not have sufficient data from lowland sites to establish cause and effect relationships between land uses and biological assemblages. Several more years of data are needed. DEQ also suggests that this recommendation be considered by the Oregon Plan Monitoring Team as it fleshes out their work plan.

**IMST Conclusions:**

- *Inadequate.* While ODA's response is positive in that they agree that linking land use activities to salmonid populations and habitat is important, we find their overall response to be inadequate. Agricultural lands dominate the western Oregon lowlands and management of these lands can have significant impacts on salmonid populations and their habitats, therefore, it is necessary that the State know how agricultural activities are affecting salmonid recovery. ODA states that they are already monitoring how land conditions affects water quality and how agricultural activities affect riparian conditions which are highly important activities. As part of their responsibilities under the Oregon Plan, ODA should take this monitoring one step further and develop habitat monitoring protocols that link their terrestrial data to aquatic habitat and salmonid populations.
- *Indeterminate.* While DEQ's response is positive and the agency has done some preliminary work in evaluating land use activities as they affect water quality in lowland river systems, it is unclear how or when the agency would undertake and expand this effort. IMST would also like to see how ODA and DEQ can increase their cooperation in meeting this recommendation.

**Recommendation 9. The Oregon Department of Agriculture (ODA) should improve the technical strength of their program under the Oregon Plan and expand its scope to address salmonid habitat requirements.**

**ODA Response:** ODA agrees with the recommendation and has attempted to link AgWQM Program to salmonid recovery on a statewide basis. However, ODA's authority within individual basins is only for water quality. The site capability framework being used will result in improving physical site conditions and should help to improve salmonid habitat conditions.

**IMST Conclusions:**

- *Indeterminate.* The recommendation indicates that ODA should improve the technical strength of their program under the Oregon Plan but has not provided information to determine if they feel that the program is technically strong or how it could be improved.

- *Inadequate.* ODA states that they have attempted to link the AgWQM Program to salmonid recovery on a statewide basis. The AgWQM Program is ODA's main vehicle to aiding salmonid recovery under the Oregon Plan, but the AgWQM area plans do not include and measures to protect, improve, or monitor salmonid habitat populations or their habitat. For AgWQM Program to be used in this role under the Oregon Plan, the area plans must address salmonid habitat and recovery.

*Question for ODA:* Your response indicates that ODA has no authority to influence the condition of the land or streams and rivers except through their impact on water quality. Is that correct? What prohibits ODA from evaluating the effects of agricultural practices on the condition of the lands and the streams and rivers that are part of that land? If there is a legal impediment to ODA addressing the consequences of agricultural practices on the land and its waters, IMST will identify this deficiency in agency authority for the Governor's Office and Legislature. We believe that ODA should be the lead agency, in coordination with other state agencies, in improving watersheds for salmonid recovery on agricultural lands similar to ODF's role in forest lands.

**Recommendation 10. Water Resources Department (OWRD), in cooperation with other agencies, should reestablish a more natural hydrograph (timing and magnitude) on an experimental basis in river systems where flow modification is occurring as a result of storage operations.**

**OWRD Response:** OWRD describes the statutory limits the agency has that affect their ability to implement this recommendation. They also note that several reservoirs in lowland systems are under federal management by the US Army Corps of Engineers (USACE). OWRD can and does make recommendations to the USACE but only in an advisory role and the recommendations are not binding. OWRD will continue to provide input on management of reservoirs. In addition the agency will continue to provide data needed to understand and describe historical hydrographs for the lowland systems.

**IMST Conclusions:**

- *Adequate.* OWRD's response and acknowledgment of the issues and needs to mimic natural hydrographs in lowlands system is positive. We encourage you to act as an advocate for salmonid recovery needs when making recommendations to USACE and to analyze available data to describe historical hydrographs more accurately.
- *Indeterminate.* We are unable to determine the long-term implementation and effectiveness of agency efforts, particularly in systems where impoundments are not under direct federal management.

**Recommendation 11. Water Resources Department (OWRD) should maintain or increase streamflow where water withdrawals and/or impoundments presently limit salmonid distribution, productivity, or migration.**

**OWRD Response:** OWRD states that their current efforts under statutory authority are consistent with this recommendation. There are several approaches to maintaining stream flow for salmonids including restricted issuances of new surface water rights where salmonids are listed under the federal ESA. Other state agencies can apply for instream rights to protect fish, minimize pollution effects, or to maintain recreational uses. OWRD promotes voluntary streamflow restoration through water use efficiency and conservation programs and water right leases and transfers and documents the effectiveness of these approaches to “put water back in the stream” and the importance of understanding groundwater and surface water interactions.

**IMST Conclusion:** *Adequate.* OWRD’s response and acknowledgement of the issues and needs to maintain or increase streamflow in lowlands system to aid salmonid recovery is positive. We applaud actions to increase streamflows. Where the agency may be depending on voluntary actions we encourage OWRD to work with groups such as the OSU Cooperative Extension Service and watershed councils to increase awareness and cooperation of water users in flow impaired systems.

**Recommendation 12. The Water Resources Commission should develop and implement a strategic plan for the long-term management of water in western Oregon.**

**WRC and OWRD Response:** The Commission and Department agree that there is a need for a strategic long-term plan for the State of Oregon and that such a plan would identify opportunities to address instream flow deficiencies, water use efficiency, and future demands for water. WRC and OWRD are actively evaluating approaches for long-term water supply management in the state and have sought input from stake-holders, however several difficult policy questions must be addressed before work can progress.

**IMST Conclusions:**

- *Adequate.* OWRC’s response and acknowledgement of the issues and need to manage the State’s water resources through a long-term management plan that would include projections of future demands on the resource.

*Indeterminate.* We are unable to determine the long-term implementation and effectiveness of agency efforts. To develop such a plan will be a lengthy task and we are encouraged that preliminary work has begun. We recognize that OWRC and OWRD have many statutory constraints and encourage them to work toward this recommendation as a long-term goal and to work to improving management of water to meet the environmental needs as well as the social needs for water and improved streamflow regimes.

**Recommendation 13. The Water Resources Department (OWRD) should coordinate with USGS to establish and maintain hydrologic gaging stations on stream and river systems critical to salmonid recovery where data are not currently available.**

**OWRD Response:** OWRD gathers and provides quality assurances on several surface water parameters including gage flow at over 200 gaging stations, and miscellaneous parameters at other locations throughout Oregon. However, some areas in the state where salmonids occur are not sufficiently monitored. OWRD puts in considerable effort to maintain existing gaging stations and in collecting and analyzing the data. However, budget limitations hinder increasing and sometimes maintaining existing stations, including ones that have been jointly operated with USGS. The agency is looking for opportunities to maintain or increase gaging stations operated by the state or in cooperation with USGS.

**IMST Conclusion:** *Adequate.* We encourage WRD to look for ways to finance and to collaborate with other entities in achieving this goal.

**Recommendation 14. The Oregon Department of Agriculture (ODA) should reduce sedimentation from agricultural practices in western Oregon lowlands.**

**ODA Response:** AgWQM area plans and rules have been developed to address sedimentation issues in western Oregon lowlands. The area plans encourage landowners to seek advice about practices and methods to alleviate sedimentation problems. Enforceable prevention and control measures provide a regulatory backstop when needed. ODA agrees that more research is needed to develop methods to reduce sedimentation but research is not conducted by the agency itself.

**IMST Conclusion:** *Indeterminate.* Overall ODA's response is positive but it does not provide information to determine how effective the AgWQM area plans are at reducing sedimentation from agricultural lands. The effectiveness of area plans need to be established through effectiveness monitoring and linked to adaptive management. Has ODA assessed the effectiveness of the AgWQM Program and area plans for water quality?

**Recommendation 15. The Oregon Department of Agriculture (ODA) and Department of Environmental Quality (DEQ) should prevent adverse pesticide impacts on aquatic systems.**

**ODA Response:** ODA's Pesticide Division already addresses pesticide use and adverse impacts. DEQ does not have regulatory responsibilities in pesticide use and management but does conduct water quality monitoring and provides permits when needed. DEQ can also issue TMDL's for particular pesticides in a body of water. When necessary, as determined by scientific data, ODA can develop rules that further restrict the use of pesticide beyond its legal label restrictions already required by EPA. ODA addresses issues in this recommendation by focusing efforts and working to reduce the need to use pesticides through integrated pesticide management.

**DEQ Response:** DEQ's ability to prevent adverse pesticide impacts is severely limited. Pesticide analysis is costly and DEQ does not have a budget to monitor pesticides. The US EPA has not developed numeric criteria for many pesticides and DEQ would have to determine which ones are problems. However, there are a few TMDLs in place for historically used pesticides such as DDT and dieldrin which are aimed at trying to minimize contaminated sediments in stormwater runoff. DEQ has also conducted a few special monitoring studies in collaboration with other agencies and groups and they list a few in their letter. DEQ is also involved in permitting the application of pesticides and herbicides directly to streams.

**IMST Conclusions:**

- *Indeterminate.* Overall ODA's response is positive but it does not provide information to determine how effective their current programs or regulations are at preventing adverse pesticide impacts on aquatic systems. The effectiveness of current programs needs to be established through effectiveness monitoring.
- *Indeterminate.* DEQ has the expertise to work with ODA and other agencies to meet this recommendation. We feel that DEQ should work to prevent adverse affects of pesticides by developing a program that focuses on determining the fate of pesticides in the environment and identifying those that are most likely to harm aquatic systems. Although EPA has not developed numeric criteria, DEQ should be able to determine from scientific literature and other studies what a reasonable level of each pesticide can be deleterious.

**Recommendation 16. The Oregon Department of Agriculture (ODA) and Oregon Department of Environmental Quality (DEQ) should prevent adverse eutrophication impacts of aquatic systems.**

**ODA Response:** ODA's AgWQM area plans and enforceable prevention and control measures have been developed to address nutrient input issues in western Oregon lowlands. AgWQM area plans are developed where 303(d) listings have specified nutrients as a water quality concern. Where DEQ has not identified nutrients as a parameter of concern, basin plans and rules reference ORS 468B as the regulatory backstop to address waste and nutrients that are or have the potential to enter state waters.

**DEQ Response:** DEQ helps to prevent adverse eutrophication of surface waters by permitting point-source discharges, on-site septic systems, and land application of biosolids and treated waste waters. The agency notes that there are currently no specific water quality standards for nutrients but if other standards are violated due to excessive nutrients, TMDLs will be developed to reduce nutrient impacts. DEQ also works with Designated Management Agencies (e.g., ODA, ODF, municipalities) and other entities to develop and implement plans to address non point-source nutrient impacts.

**IMST Conclusions:**

- *Indeterminate.* Overall ODA's response is positive but it does not provide information to determine how effective their current programs or regulations are at preventing adverse eutrophication impacts on aquatic systems. The effectiveness of current programs needs to be established through effectiveness monitoring.

- *Indeterminate.* While DEQ has some means to implement preventative strategies through regulation and permitting, they do not address how, in conjunction with ODA, the agency can identify and prevent adverse eutrophication from agricultural lands. Together both agencies have the technical expertise to address this recommendation. We do not see evidence of DEQ working with ODA and are unable to determine the extent of their plans to do so. DEQ points out that there are no standards for nutrients but this should not prevent the agencies from being proactive in addressing the issue of detrimental nutrient inputs into surface waters.

**Recommendation 17. The Oregon State University (OSU) Agriculture Experiment Station (AES) and the OSU Cooperative Extension Service (CES), working with other state agencies involved in research, should increase understanding of how rural land use activities in the western Oregon lowland systems interact with and affect salmonid recovery.**

**OSU Response:** None received to date.

**AES Response:** None received to date.

**CES Response:** None received to date.

**Recommendation 18. The Division of State Lands (DSL), Water Resources Department (OWRD), Oregon Department of Fish and Wildlife (ODFW), and Oregon Department of Transportation (ODOT) should reestablish and maintain natural fish passage for juveniles and adults in lowland stream systems.**

**DSL Response:** DSL responded to recommendations in an April 15, 2005 letter. The responses are in the process of being evaluated by the IMST.

**OWRD Response:** OWRD staff work with willing water right holders to maintain or re-establish fish passage. Through the Oregon Plan, OWRD, DSL and ODFW have coordinated to assist water users in replacing over 60 push up dams with alternate diversion structures. OWRD agrees that a strategic plan to eliminate barriers to fish passage would help their agency to direct limited staff resources and that they would be interested in working with other agencies to develop a plan.

**ODFW Response:** ODFW currently manages a fish passage barrier database that is spatially explicit and includes information on dams, culverts, natural barriers, and tide gates. The weakest element of the data in the database is on culverts because much of the information is located in different state and federal databases. As the database becomes more complete it will become an important resource in developing plans under their native fish conservation strategy.

**ODOT Response:** ODOT has several existing programs and efforts in place to meet the recommendation. In the last three years, ODOT has retro-fit or replaced 27 culverts or tide gates and improved passage to 106 miles of habitat. ODFW and ODOT staff report fish passing at these locations. Other projects have included improving fish habitat and passage including

adding jump pools, weirs, placing large wood, etc. The agency is also involved with a multi-agency monitoring project to determine the success of retro-fitting culverts to improve fish passage.

**IMST Conclusion:** *Adequate.* Responses by OWRD, ODFW, and ODOT on their coordinated efforts are positive. We encourage the agencies to continue their work and also to find new ways to implement this recommendation as well as to develop monitoring programs to determine the effectiveness of the fish passage improvements, as well as which structure are sound or need maintenance. We encourage ODFW to work with watershed councils to inventory and assess culverts on private lands.

**Recommendation 19. Division of State Lands (DSL) and Oregon Department of Fish and Wildlife (ODFW) should protect and restore hydrologic function and salmonid habitat in freshwater and tidal wetlands.**

**DSL Response:** DSL responded to recommendations in an April 15, 2005 letter. The responses are in the process of being evaluated by the IMST.

**ODFW Response:** ODFW notes that they do not have a regulatory role regarding freshwater and tidal wetlands. By statute, the Department does review and comment on regulatory issues affecting these resources, and acts in a technical advisory role. ODFW also assists private landowners to secure funding, negotiate permits, and assist with construction and deconstruction of structures as need for restoration.

**IMST Conclusion:** *Indeterminate.* While ODFW indicates their willingness to work with DSL they do not indicate how this cooperation will occur and how they would help DSL determine priority areas. ODFW has the technical expertise on salmonid requirements that DSL does not have, therefore their cooperation and collaboration is critical for the State of Oregon to improve conditions in fresh water and tidal wetlands to aid salmonid recovery.

**Recommendation 20. Department of Land Conservation and Development (DLCD), in conjunction with Oregon Department of Fish and Wildlife (ODFW), should improve and protect salmonid habitat in Oregon's estuaries.**

**DLCD Response:** DLCD state that this recommendation encapsulates their process of developing and implementing Statewide Planning Goal 16 – Estuarine Resources which occurred during the late 1970's through the mid-1980s. Estuary management plans developed according to OARs and Goal 16 are still in place today and governs the uses and activities in Oregon's estuaries. The agency believes that this recommendation has already been largely implemented, except for the emphasis on salmonid habitat needs, and for the development of explicit restoration plans. The agency discussed the implementation of these two components in detail in their letter which was taken into consideration during our evaluation.

**ODFW Response:** ODFW completed habitat mapping for DLCD for all of Oregon's estuaries in the late 1970's and notes that they need to be updated to reflect current conditions. ODFW also

worked with DLCDC and counties to develop original estuarine management plans which should be updated through DLCDC's periodic review process. ODFW will participate in upcoming county and city updates of estuary plans. ODFW has also started to meet with DLCDC staff to determine how Goal 16 can be strengthened to better address salmonids but ODFW has limited funds.

**IMST Conclusion:** *Adequate*. The work previously done by DLCDC and ODFW is a critical step in meeting this recommendation. Information on salmonid habitat requirements and use of estuaries has increased substantially since the original plans were written. The use of some estuaries may have shifted in the same time period (e.g., change in the amount and type of commercial shipping use, change in dredging frequency, land development surrounding estuaries etc.) therefore we endorse and encourage the agencies efforts to re-survey Oregon's estuaries and to identify habitats important for salmonids. Both agencies should continue to collaborate to determine how best to address salmonid needs in revised management plans and to develop recovery plans.

**Recommendation 21. Oregon Department of Fish and Wildlife (ODFW) should prevent loss of salmonids because of water diversion.**

**ODFW Response:** ODFW has an active program to prevent loss of salmonids because of water diversions. The agency's Fish Screening and Passage Program provides technical and financial support to water users, landowners, municipalities, and industry to assist in designing, installing, and maintaining fish protection screens and fishways. The program develops fish screening and passage criteria and guidelines for the design of these facilities. Since 1991, 832 screens and 15 fishways have been installed. The program is currently conducting inventories in the Klamath and Rogue basins that will assist the Department in identifying high priority projects for this Biennium.

**IMST Conclusion:** *Adequate*. ODFW's response and work in progress is positive and we encourage continued work to protect salmonids from water diversions. We also encourage monitoring on a regular basis to determine which 'fixed' screens and new fishways need repair or replacement.

**IMST's Evaluation of Responses to Recommendations made in:  
IMST Review of the USFWS and NMFS 2001 Biological Opinions on Management of the  
Klamath Reclamation Project and Related Reports  
Technical Report 2003-1**

**Recommendation 1. The IMST recommends that the State of Oregon work with the State of California and the federal agencies and tribal co-managers to develop an integrated long-term management program for the entire Klamath River Basin.**

**ODFW Response:** ODFW supports the recommendation and participates in meetings between representatives for the Governors of Oregon and California to find long-term solutions for the Klamath River basin. The meetings also include representation from federal agencies with interests and jurisdictions in the Klamath Basin. A mechanism under consideration that will meet the IMST recommendation is the Klamath River Basin Conservation Implementation Program. The program would serve to coalesce all of the interested parties in the basin into a solution oriented workgroup with a focus on sucker and salmon recovery while sustaining the basin's agricultural economies. One of the early out-comes of the meetings has been a list of early implementation actions, supported by both states, that address known fish, habitat, and water issues within the basin.

**IMST Conclusion:** *Adequate.*

**Recommendation 2. The IMST recommends that the State of Oregon consult with the State of California and the federal and tribal co-managers to develop a program for collecting relevant data on sucker populations and lake habitats and salmonid populations and river habitats in the Klamath River Basin.**

**ODFW Response:** ODFW supports this recommendation and noted that the agency actively participated in the February 3-6, 2004 Upper Klamath Basin Science Workshop. The workshop provided a venue for exploring and developing better direction for science intended to help define appropriate recovery actions for Klamath suckers. Additional workshop will be conducted to refine investigations needed for sucker recovery. In addition, ODFW has been involved in discussions with the California Dept. of Fish and Game (CDFG) regarding river management and salmon habitat. Both agencies have coordinated recommendations to PacifiCorp regarding information needs for Klamath River hydro-electric project re-licensing. Both agencies are also coordinating efforts to identify river conditions that impact salmon populations. Further work by the states will better refine and coordinate inventory and monitoring efforts that will meet the intention of this recommendation.

**IMST Conclusion:** *Adequate.*

**Recommendation 3. The IMST recommends the Department of Fish and Wildlife of the State of Oregon to collaborate with the State of California and the federal and tribal co-managers to develop monitoring data is needed on salmonid use of the mainstem Klamath River throughout the entire year, including summer and autumn.**

**ODFW Response:** ODFW supports this recommendation and stated that the agency believes that actions identified to increase monitoring capability along with current work by lower river tribes and CDFG are helping to address this issue. Additional riverine species of interest include redband trout, particularly above Iron Gate Dam, and fall chinook. The issue of streamflow related habitat needs of chinook has become a significant concern following the 2002 die-off of chinook in the lower river.

**IMST Conclusion:** *Adequate.*

**Recommendation 4. The IMST recommends that the State of Oregon collaborate with the State of California and the federal and tribal co-managers to develop and test a model that relates the influence of management actions on Upper Klamath Lake, on the long-lived sucker species in the lake, and flows in the Klamath River.**

**ODFW Response:** ODFW supports the recommendations but recognizes the challenges associated with developing the appropriate model to describe sucker population responses to specific actions. They note that the life history characteristics of a long-lived species such as the suckers present specific challenges because of the lack of methodologies to collect basic population parameters necessary to construct “stock recruitment functions” or other population productivity indices.

**IMST Conclusion:** *Indeterminate.* ODFW does not specify any collaborative action plans that could be developed with co-managers to address this recommendation. While model development can be a lengthy process as well as collecting data to use for the model it is not an unreachable goal to work towards. ODFW may also want to contact Dr. Doug Markle at Oregon State University regarding recent and on-going research his lab is conducting on Klamath Lake sucker populations.

**Recommendation 5. The IMST recommends that the State of Oregon work with the State of California and the federal and tribal co-managers to resolve the debate about the historical climate and streamflow in the Klamath River Basin and develop a common framework for determining appropriate instream flow in the mainstem Klamath River.**

**State of Oregon Response:** None received to date.

**Recommendation 6. The IMST endorses efforts to restore the wetlands around Upper Klamath Lake and recommends that the State of Oregon place high priorities on opportunities to restore wetlands and riparian areas along streams and lakes within the Klamath River Basin.**

AND

**Recommendation 7. The IMST recommends that the State of Oregon, State of California, and federal agencies increase technical assistance to land owners along streams, rivers, and lakes in the Klamath River Basin restore riparian areas, wetlands, and streamflows to the degree possible.**

**ODFW Response:** ODFW supports both Recommendation 6 and 7. The agency notes that wetland and riparian enhancement has long been a focus in the upper Klamath River basin and further work is included in the top ten early implementation list mentioned in response to recommendation 1.

**IMST Conclusion:** *Indeterminate.* While ODFW mentions that wetland and riparian enhancement is among the top ten early implementation list, the agency does not indicate what actions and at what scale actions will be taken. ODFW also does not indicate how long-term effectiveness of those actions will be determined.

**Recommendation 8. The IMST recommends that the State of Oregon develop explicit, measurable benchmarks for environmental conditions that represent periods of high ecological risk. State policies could be refined to identify precautionary actions that would be triggered during periods of high risk and greater uncertainty.**

**ODFW Response:** ODFW supports this recommendation and believes that the intent of this recommendation will be best achieved when the goals of Recommendation 4 are met.

**IMST Conclusion:** *Indeterminate.* ODFW does not indicate what can be done in the short-term while a model is developed in response to Recommendation 4.

**Recommendation 9. The IMST recommends that the Oregon Water Resources Department resolve and complete the on-going adjudication process in the Klamath River basin. The previous IMST recommendations require active water resource management in the Klamath River Basin, and adjudication is essential before implementing these recommended actions.**

**OWRD Response:** OWRD indicated that the Klamath Basin Adjudication is Oregon's first general stream adjudication that has involved large, complex federal claims. Over 700 claims were filed by private, federal, and Indian claimants. Those claims resulted in over 5600 contests. At the time of their April 21, 2004 letter to the IMST, OWRD had resolved 83% of the contests and continued to be in active settlement discussions and contest proceedings on the remaining cases.

**IMST Conclusions:** *Adequate.* OWRD's response on their progress with the lengthy adjudication is positive and urges the State to continue to support the agencies work to resolve the remaining cases. As mentioned in the recommendation, the completion of the adjudication process is necessary in order for the State of Oregon to actively manage the limited water resources within the Upper Klamath River basin and to effectively work with the State of California and the federal government to manage water resources within the entire Klamath River basin.

**Recommendation 10.** The IMST recommends that in tributaries and springs of Upper Klamath Lake, ODFW, in collaboration with other state agencies, assess water quality and fish passage problems that potentially limit sucker recovery. The IMST recommends that ODFW assess effectiveness of the existing fish ladder for passage of adult suckers at the Chiloquin Dam. ODFW and DEQ should assess and improve water quality in spawning areas.

**ODFW Response:** ODFW supports this recommendation at it pertains to those actions where the agency has statutory authority (fish passage and habitat quality). ODFW work collaboratively with DEQ on issues of water quality monitoring and assessment. The Chiloquin Dam has long been noted as an impairment to adult sucker passage. Removal of the dam is one of the top ten early implementation actions and is slated for federal funding in 2005.

**DEQ Response:** Through the TMDL process DEQ is engaged in water quality improvements in Upper Klamath Lake. The agency has assessed water quality in the basin and through the Upper Klamath Lake Drainage TMDL has prepared a plan to improve water quality in sucker spawning areas in the Sprague river. The TMDL indicates that significant improvements in water quality can be achieved by improving conditions of riparian areas and channel morphology in tributaries to Upper Klamath and Agency Lakes. DEQ also supports the removal of Chiloquin Dam. Water quality improvements will require designated management agencies, both federal and state, to develop and implement water quality management plans on lands under their jurisdiction. DEQ plans to actively support and interact with these agencies to make sure they meet their water quality obligations.

**IMST Conclusions:**

- *Adequate.* ODFW's response is adequate.
- *Indeterminate.* While DEQ's response is positive and the agency has completed and has received EPA approval on the Upper Klamath Lake Drainage TMDL, it is unclear how or when the agency will monitor water quality improvements in sucker spawning areas. We would like to receive more detailed information on directions given designated management agencies on developing and implementing water quality management plans, locations of monitoring sites relative to major springs and spawning areas, and what water quality parameters are being monitored and at what times of the year in regards to sucker spawning and rearing.

**IMST's Evaluation of Responses to Recommendations made in:  
Oregon's Water Temperature Standard and its Application: Causes, Consequences, and  
Controversies Associated with Stream Temperature  
Technical Report 2004-1**

**Recommendation 1.** IMST recommends the Oregon State University (OSU) Extension Service and relevant state agencies develop a coordinated education and information distribution system for citizens, watershed councils, and special interest groups on the topic of elevated stream temperature. We recommend that OSU Extension Service conduct workshops to summarize current relevant scientific information to be included in educational programs.

**OSU Extension Response:** None received to date.

**Recommendation 2.** IMST recommends that Oregon Department of Environmental Quality (DEQ) continue systematic evaluation of the performance of Heat Source, the model that is used in total maximum daily load (TMDL) planning for stream temperature.

**DEQ Response:** The agency commented that if the outcomes differ with side-by-side model comparisons it can be difficult to get past the model "bias" to determine which model is more accurate, meaning that each modeler would likely defend his/her model. The agency feels that it would be more productive to verify and validate the Heat Source model itself. For example, after developing a temperature model to predict stream temperature for a TMDL, DEQ would collect certain data the following year and plug it into the model to see how well it predicts the measured stream temperature. DEQ hopes to do more of this once the first rounds of TMDLs are developed. The agency noted that the court-ordered schedule for completing TMDLs and reductions in modeling and monitoring staff that this work is not possible at this time, however, if a university affiliate would be willing to conduct the analyses, the agency would make the model available to them.

**IMST Conclusion:** *Adequate*. However, the IMST notes that side-by-side model comparisons are valuable and should not be overlooked by DEQ. The IMST also recommends that model evaluation is a long-term, ongoing process and did not intend that DEQ do this work in the immediate future.

**2a. IMST recommends that DEQ conduct a sensitivity analysis of the major factors included in the Heat Source model.**

**DEQ Response:** DEQ agree that sensitivity analysis is an important part of their TMDLs and are expanding their efforts to do sensitivity analyses on streams that TMDLs are developed for. DEQ noted that sensitivity analysis gives information on what parameters the model is sensitive to as well as what the system is sensitive to. The analysis is dependent upon model calibration and needs to be replicated on a variety of streams to have confidence in the findings. DEQ's TMDLs currently include sensitivity analyses on

shade/vegetation, stream discharge, and channel morphology. They gave examples from their Umpqua and Upper Klamath Lake drainage TMDLs. DEQ also agree that a more robust evaluation – one that addresses parameters such as hyporheic exchange – would be beneficial and expect to expand into that area in the future and would most likely occur when they encounter a TMDL where they believe hyporheic flow is a critical element of the stream system.

**IMST Conclusions:** *Adequate*.

**2b. DEQ should publish the comparisons of the goodness of fit between Heat Source Model predictions and independently observed water temperature data for analyses conducted in the TMDL process.**

**DEQ Response:** DEQ disagrees that it would be beneficial to use data from a new basin to document the performance of the model before any adjustments are made. The usefulness of the model is dependent on being calibrated to local conditions: it will not produce meaningful results without this step.

DEQ does agree that continued verification of the model is necessary. And the agency would approach this as they described above in their response to Recommendation 2. The note that if this approach does not accomplish what the IMST is recommending, DEQ will need to discuss it with the IMST to better understand IMST’s goal.

**IMST Conclusion:** *Inadequate*. There is a difference of opinion between IMST and DEQ. IMST would like to discuss it further with DEQ. The goodness-of-fit for the initial model runs is informative about the overall generality of the model. Lack of fit does not mean that the model is weak or inappropriate. We recognize that calibration of the model increases its accuracy for a specific basin. Our recommendation intends to make information about the general performance of the overall model structure openly available.

**Recommendation 3. IMST recommends that Oregon Department of Fish & Wildlife (ODFW) and Oregon Department of Environmental Quality (DEQ) conduct or fund studies of temperature requirements and/or use of coldwater habitat by redband trout, Lahontan cutthroat trout, and other temperature-sensitive aquatic species occurring in more arid areas in the state.**

**ODFW Response:** None received.

**DEQ Response:** The Legislature generally does not fund DEQ to conduct this type of in-depth research. We believe that the universities are better situated to do this type of work and they’d be very interested in cooperating on such a project.

**IMST Conclusion:** *Inadequate*. The Preamble of the IMST’s report and the introduction to the IMST’s recommendations addresses this point. “It should be noted that the IMST looks beyond

an agency's current ability to implement the recommendations because current legal, regulatory, or funding situations may need to change. It is the belief of the IMST that if an agency agrees that a recommendation is technically sound and would aid the recovery of salmonid stocks and watersheds, the agency would then determine what impediments might exist to prevent or delay implementation and work toward eliminating those impediments. The Team also assumes that each agency has the knowledge and expertise to determine how best to identify and eliminate impediments to implementation and to determine appropriate time frames and goals needed to meet the intent of the recommendation."

The IMST recommends that the State of Oregon develop studies of temperature requirements and/or use of coldwater habitat by redband trout, Lahontan cutthroat trout, and other temperature-sensitive aquatic species occurring in more arid areas in the state. These studies can be conducted by the state or could be funded by the state (perhaps through universities as suggested by DEQ). It is up to the Governor's Office and Legislature to decide whether to do this and how to do this. IMST considers ODFW and DEQ to be major agencies that should be involved in such studies.

**3a. IMST recommends the State of Oregon and DEQ to examine the thermal requirements of species that may not be protected by the existing water quality standard (i.e., coldwater species).**

**State of Oregon Response:** None received.

**DEQ Response:** DEQ stated that they are generally not funded to do this type of research but would be interested in cooperating with a university or other agency that is able to do so. ODF[W], as well as federal fish and wildlife agencies, would be best able to identify the species warranting additional study.

**IMST Conclusion:** *Inadequate*. Please see our comments listed for Recommendation 3 above.

**Recommendation 4. IMST recommends that the Oregon Watershed Enhancement Board (OWEB) develop consistent guidance on assessment of current conditions of stream and riparian areas relative to elevated stream temperature.**

**OWEB Response:** OWEB responded that the agency has been working on the components of Recommendation 4. The agency has been working on a variety of science-based products related to riparian conditions in Oregon. OWEB has sponsored four major efforts to date by developing: 1) a water quality monitoring handbook that specifically addresses the measurement of water temperature and shade; 2) a riparian assessment framework; 3) a coastal restoration guidebook; and 4) a compilation of native plant communities for northwestern Oregon, and central and eastern Oregon.

**IMST Conclusion:** *Adequate*.

**4a. IMST recommends that the State of Oregon adopt methods to evaluate stream and riparian conditions as part of programs to protect and restore stream temperature.**

**OWEB Response:** OWEB has developed consistent guidance (2004 Oregon Riparian Assessment Framework) . The agency is also working to budget a pilot program for the consistent application of riparian inventories. The guidance was developed by an interagency group and is prepared for use by councils and others.

**IMST Conclusion:** Adequate.

**4b. IMST suggests development of a classification system for determining riparian reference conditions and riparian plant associations for all regions in Oregon. They should be peer-reviewed to assure their validity for each region.**

**OWEB Response:** The publication of two products [by the Oregon Natural Heritage Information Center with funding provided by OWEB] in 2004 titled *Riparian and Wetland Vegetation of Central and Eastern Oregon* and *Native Freshwater Wetland Plant Associations of Northwestern Oregon* address this recommendation. The publications provide specific information on native plant communities that can be used to identify reference sites.

**IMST Conclusion:** Adequate.

**4c. IMST recommends the State of Oregon support efforts to coordinate management of stream temperature among stakeholders and across jurisdictional boundaries.**

**OWEB Response:** OWEB has been funding water temperature monitoring at the local level as well as riparian restoration efforts both as individual projects and through the Conservation Reserve Enhancement Program [a list of projects was attached to OWEB's original letter]. OWEB has also funded a Volunteer Monitoring Coordinator at the Department of Environmental Quality who has provided assistance to watershed councils and others. Additional effort is required to systematically characterize and address the thermal regimes of Oregon's aquatic resources.

**IMST Conclusion:** Adequate.

**Recommendation 5. IMST recommends that Oregon Watershed Enhancement Board (OWEB) and Oregon Department of Environmental Quality (DEQ) should jointly monitor effectiveness of protection and restoration activities aimed at improving stream temperatures. OWEB and DEQ should coordinate with other state agencies involved with temperature issues including ODA, ODF, and ODFW.**

**OWEB Response:** OWEB has evaluated the effectiveness of riparian planting projects (*Coastal Oregon Riparian Silviculture Guide*). At the May 27, 2004 OWEB Board meeting, the Board is considering the allocation of approximately \$800,000 for effectiveness monitoring. OWEB will work directly with DEQ to address the effectiveness of projects aimed at improving stream temperatures.

**DEQ Response:** DEQ agrees with the recommendation. Coordination for monitoring among the state agencies has improved via the Oregon Plan Monitoring Team. However, DEQ, acknowledges that there is more potential for coordinating efforts and are working to do so in the future. DEQ presented a couple of examples including the possibility of coordinating grant programs with OWEB; engaging stakeholders in monitoring activities where temperature TMDLs are being implemented; and finding ways that TMDL monitoring can better support DEQ's statewide ambient monitoring program and vice versa.

**IMST Conclusion:** Adequate.

**Recommendation 6. IMST recommends that the Oregon Water Resources Department (OWRD) should continue to promote protection of instream water flows for fish and aquatic life.**

**OWRD Response:** OWRD indicated that the agency is committed to its goal to restore and protect streamflows and watersheds in order to ensure long-term sustainability of ecosystems, economies, and qualities of life. OWRD indicated that under Oregon water law, public interest review of new water right permits and instream water rights are useful approaches to maintaining streamflows to address water quality concerns. Oregon law does allow water holders to sell, lease, or donate water rights to be converted to instream water rights and these voluntary efforts can assist restoration of instream flows. OWRD also listed the reviews of water use changes and opportunities for other state agencies to review the requests. Additionally DEQ, ODFW, and Oregon Department of Parks and Recreation can apply for instream water rights to minimize pollution, fish protection, or for maintaining recreational uses, respectively. Once issued, OWRD holds the water rights as a trustee for the people of the State of Oregon. Since 1987 a total of some 1,500 instream water rights statewide have been approved since 1987. OWRD include information on rights requests by DEQ.

In addition to instream water rights, OWRD promotes voluntary streamflow restoration through water use efficiency and conservation programs and water right leases and transfers and that these have been shown to be effective restoration tools. In 2004, there were 323 active instream leases, instream transfers, and allocations or conserved water with 431 cfs protected instream;

representing a 332% increase in streamflows restored and a 600% increase in streamflow restoration actions since the Oregon Plan was adopted in 1997.

**IMST Conclusion:** *Adequate.* OWRD's response on their efforts to promote increased instream flows to improve water quality is positive and urges the State to continue to support the agency's efforts. The IMST encourages OWRD to continue their work and to develop more long-term programs when possible.

**Recommendation 7. IMST recommends that Division of State Lands (DSL) and Oregon Department of Agriculture (ODA) should emphasize and implement programs to restore wetlands for use as natural water storage systems.**

**DSL Response:** DSL responded to recommendations in an April 15, 2005 letter. The responses are in the process of being evaluated by the IMST.

**ODA Response:** ODA responded that the agency does not have authority for wetland development, however, they do recognize the role wetlands play within watersheds. Members of the agricultural partnership (i.e. USDA's Natural Resources Conservation Service and Farm Service Agency, and soil and water conservation districts) have a direct responsibility for this area and the department supports their efforts in this area.

**IMST Conclusion:** *Intermediate.* The IMST disagrees with the state role ODA has in protecting and restoring wetlands. While ODA does not have similar authorities in restoring wetlands that DSL has, the agency does have responsibilities to protect water quality under SB 1010. Wetlands are an important component in maintaining water quality within watersheds. The recommendation says the agencies "should emphasize and implement programs". ODA is in a key position, as is the Soil and Water Conservation Commission to educate the agricultural community about the importance of wetlands in watershed health and in enhancing water quality. Where the agency may not be able to implement programs they can advocate the need for programs and review potential programs developed by federal and state agency partners.

**Recommendation 8. IMST recommends that the Governor's Natural Resource Office [GNRO] and the Oregon Legislature complete and implement a statewide program of riparian protection and restoration. The Oregon Riparian Policy should be expanded and used as a framework for restoring the riparian resources of the State of Oregon.**

**GNRO and Legislature Response:** None received to date.