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TO: William Ruckelshaus and Curt Smitch, Co-chairs
Monitoring Oversight Committee

FROM: Kenneth Currens, Chair

DATE: 10 October 2001

SUBJECT: Comments on Monitoring Goals and Objectives

Thank you for the opportunity to comment on these objectives. We are encouraged by the interest and progress that the Monitoring Oversight Committee and project staff are making. Overall, we concluded that the draft goals and objectives are a good first step. We have used this opportunity to suggest additional changes that we believe would improve the goals and objectives. To do this, we asked ourselves four questions:

1. *Are they complete?* By this we mean, "If we succeeded in all the objectives would we have accomplished the goals?"
2. *Are they clear?* By this we mean, "Do the goals and objectives provide enough unambiguous direction that both the public and technical groups can understand them?"
3. *Do the goals address uncertainty?* By this we mean, "Do the goals and objectives require scientific estimates of how confident we are that the objectives are being met?"
4. *Are they consistent?* By this we mean, "Are the goals and objectives organized in a way that is logical and reflects priorities?

Completeness

We evaluated completeness by whether the monitoring goals and objectives addressed the major known factors affecting salmon populations and watershed health. We found six areas that need improvement.

1. *Articulating Important Questions.* In our report *Recommendations for Monitoring Salmon Recovery in the Washington State* we stressed the importance of identifying the important questions to be answered related to the goals and objectives. Identifying the important questions helps focus the goals and objectives and guides how the different types of monitoring might be used and prioritized. We recommend that these questions be identified.

2. *Implementation, Effectiveness, and Validation Monitoring.* In general, the emphasis in the goals appears to be on trend monitoring (which the ISP considers part of effectiveness monitoring) versus implementation and validation monitoring. It is not clear whether this reflects policy or is an inadvertent consequence of the way the monitoring goals and objectives are organized. The questions addressed by these types of monitoring, which we discussed in our report, are all important if a monitoring program is to work. The last objective of each goal does acknowledge implementation, effectiveness, and validation monitoring, but we found it much too broad and vague. In fact, assuming the term "measuring progress" broadly includes implementation, effectiveness, and validation monitoring, we found it largely redundant with the goal statements. We recommend that the organization of the goals and objectives explicitly address the three kinds of monitoring.
3. *Factors outside of Washington State that affect salmon recovery.* A variety of factors outside of the geographical boundaries and legal authority of Washington State agencies and tribes affect salmon recovery. These include fishing, hatchery activities, ocean conditions, and water development and uses. All of these were included generally in the draft language of the objectives, but it was not clear to us whether the geographic scope extended beyond Washington. The MOC operating principles appear to focus on state boundaries except when an ESU is shared between states. Objective 3.D, however, seems to indicate that for some issues the geographical scale is very broad. Scientifically, this makes sense. Even though the political or institutional mechanisms to monitor these factors or share data may not be available yet, these will improve in the future. To be complete, we recommend that the MOC goals and objectives identify these situations and broaden the scope for these beyond Washington, even though the local agencies or tribes may not actually be doing the monitoring. It might be possible to cover these situations as a separate goal.
4. *Ecological Interactions Among Species.* A large amount of scientific evidence shows that the health of wild salmon populations depends on interactions among aquatic species that goes well beyond the interactions of hatchery and wild fish. A recent, well-publicized example is the predation of Caspian terns on salmon in the Columbia. We recommend that an objective be added that deals specifically with this aspect of salmon recovery.
5. *In-stream Habitat.* None of the goals or objectives address habitat in streams. We recommend that this be addressed in the objectives.
6. *Hydropower Development and Dams.* The draft of the goals and objectives may be including the affects of hydroelectric power development and dams on water quality, quantity, and passage as part of Goal 2 and Objective 3.E, but this was not obvious. We recommend that the goals and objectives link the affects of hydropower development and dams more explicitly to water, watershed health, and impacts on salmon recovery.

<u>Clarity</u>

We identified a number of areas where we believe the goals and objectives could be expressed more clearly to communicate intent to the public and technical staff.

1. *Distinguishing Different Kinds of Goals.* Three different kinds of goals affect this project. These are 1) the goals defined for populations or watershed health (such as those being developed by the Shared Strategy and watershed planning), 2) goals defined for a comprehensive monitoring strategy, and 3) project goals to develop the Comprehensive Monitoring Strategy called for by the Legislature. We believe the last two are especially easy to confuse. For example, we did not understand the wording change from "Measure" to "Be able to measure" approved by the MOC. Some of us interpreted this as the difference between a goal for monitoring and a project goal. Others of us perceived this as a weakening of the commitment to monitor. In terms of the wording change, we believe the former is more consistent with the second kind of goal and our *Recommendations for Monitoring Salmon Recovery in the Washington State.* We recommend that we keep the distinction clear between what is required for good monitoring and what the project may actually be able to accomplish within the time frame and resource given it by the Legislature.
2. *Ambiguous Terminology.* We recognize that it is not always possible to define every word that might be confusing in goal and objective statements. Better descriptions of what is actually intended by broad concepts, such as fish mortality condition, production goals, and watershed health, would be useful to the general public and the technical staff. Currently, only the context of the objectives provides general readers with a description of what the terms mean. This could be potentially confusing. For example, an astute reader might suppose that watersheds are quite broad, given that large-scale ocean conditions and climate are included in Goal 3. Likewise, technical staff may presume definitions that are narrower or not consistent with the concepts that the MOC has in mind. Within the ISP, for example, we had at least two very different interpretations of what Objective 1.C meant. We recommend that the staff develop tools to communicate these ideas to the working groups more precisely. Likewise as working groups refine these ideas technically, there should be regularly scheduled opportunities for MOC to review the definitions so that the general intent is not lost or misunderstood.

<u>Uncertainty</u>

An important purpose of scientific monitoring is to quantify and minimize uncertainty. For a variety of reasons, monitoring may not be able to detect statistically significant differences soon enough to know what trends are really true or false within the time frames required for decision making. Ideally, objectives should describe the certainty that decision makers desire, which might be expressed similar to "detect with *X*% confidence level within *Y* years a positive trend in…(some desirable characteristic)." This provides the kind of direction to technical personnel they need to design monitoring plans. Subsequent analysis may show, however, that it is difficult or impossible to provide the desired level of certainty, especially without bold management actions. In these cases, monitoring should be designed to estimate the likelihood of different scenarios, even if it is not possible to fully reject or accept them or they do not reach the level of certainty desired by decision makers. Although this does not tell decision makers

what is true or false, it does provide scientifically based information for making decisions. Consequently we recommend that each of the goals be changed to "Measure progress *in terms of scientific certainty* in…(the goal)"

Consistency

We recognize that these goals and objectives could be organized in many different ways. With one exception, our comments focus on non-scientific issues that the MOC might want to consider. We have not recommended any changes for those issues but rather call them to your attention.

1. *Mixing Measurement, Analysis, and Interpretation.* As noted earlier, most of the objectives focus on measuring and reporting trends in indicators. Objectives 1.B and 1.C, however, include everything from measuring and reporting trends in indicators to monitoring and analyzing factors affecting those trends to interpreting the results. This difference draws attention to Objectives 1.B and 1.C and raises questions about the difference in approach. Although we agree that all of these are important, we believe that measurement of trends, analyses of factors, and interpretation of results should be separated as objectives. First, to a large extent they depend on different kinds of monitoring. Second, both the scientific rigor and ownership of these different products are different. The scientific rigor for data and trends is maintained through careful experimental design and quality control-quality assurance, whereas scientific rigor for subsequent analyses and interpretation is maintain through independent peer review. We would hope, for example, that in a comprehensive monitoring program everyone would agree on data, but we would expect that scientists or agencies might disagree about what kind of analyses that are appropriate to examine factors for changes in patterns and what they mean. By mixing measurement, factor analyses, and interpretation we may actually hinder both the scientific and policy discourse necessary to make good decisions and we hinder the transparency that is important for maintaining public credibility. Consequently, we recommend that for all the objectives measurement, factor analyses, and interpretation should be kept separate. Equally important is that the MOC provide policy direction to working committees to develop the mechanisms for maintaining rigor and accountability at each step of measurement, analysis, and interpretation.
2. *Is the organization efficient for understanding and solving the problem?* Currently the goals are organized into fish, water, and watershed health. This mostly seems to follow the organization of agencies rather than biology. We recognize that there may be good political and logistical reasons for this. It does, however, create logical inconsistencies, such as including ocean conditions in watershed health or separating watershed health from water. These can create omissions and inefficiencies that could weaken the project, such as leaving out in-stream habitat as something that is important to monitor for salmon.
3. *Does the organization of goals and objectives imply funding priorities or guidelines?* We believe this is a valid question the MOC might receive from the public or other interested agencies and organizations. For example, might we expect that equal effort will be given to fish, water, and watershed health?

Likewise, because monitoring salmon riparian habitat and habitat in nearshore areas are given equal weight in the organization, would we expect equal effort?

Conclusions

The goals and objectives are a good start. We recommend the following changes to the goals and objectives to ensure that they are complete, clear, consistent, and address uncertainty:

1. Identify the important questions relating to goals and objectives.
2. Explicitly address implementation, effectiveness, and validation monitoring in the organization of the goals and objectives.
3. Identify factors outside of Washington that affect salmon recovery and address them in the goals and objectives, even though the local agencies or tribes may not actually be doing the monitoring.
4. Add an objective that addresses ecological interactions and salmon recovery.
5. Ensure that the objectives address in-stream habitat.
6. Link the affects of hydropower development and dams more explicitly to water, watershed health, or impacts on salmon recovery.
7. Maintain a distinction between the goals for good monitoring and what the project intends to accomplish within the time frame and resources given it by the Legislature.
8. Develop tools to communicate the ambiguous concepts in the goals and objectives to the work groups more precisely and schedule opportunities for MOC to review the definitions developed by the work groups so that the general intent is not lost or misunderstood.
9. Change each goal statement to read "Measure progress *in terms of scientific certainty* in…(the goal)"
10. Separate objectives for measurement, analyses, and interpretation.
11. Provide policy direction to working committees to develop the mechanisms to maintain rigor and accountability at each step of measurement, analysis, and interpretation.

We are encouraged with your progress and we look forward to more, productive interactions in the future.