

# **Sustainable Ecosystems Institute**

## **Channel Deepening Project Review**

### **Process Summary**

The Sustainable Ecosystems Institute process included formal and informal review of scientific materials by SEI staff and an independent panel of seven scientific experts. This included five public meetings from March - August 2001 to review the science underlying the proposed Columbia River channel deepening project. It also included ad hoc meetings between panelists and project managers and agency scientists, as well as a questionnaire completed by all the panelists. The panel addressed only issues relevant to conservation of threatened and endangered salmonids. The panel determined that the knowledge base is adequate based on its comprehensive discussion of all relevant issues. Major areas of consideration are summarized below.

#### **Numerical Model**

The panel evaluated the modeling used by the Corps of Engineers in its original EIS. In looking at the modeling input-output table, the reconsultation parties identified five hydraulic parameters of concern for the estuary: Salinity, surface-water elevation, depth, velocity, and temperature. In general, the panel felt that: 1) While some outstanding issues remain to be integrated into the numerical model, it nevertheless provides valuable information on a range of physical factors from which inferences can be made about their effects on fish. 2) Since the model makes the case that the project would have little impact on the channel, 'physical reasoning' dictates that even less impact would occur in the periphery. 3) The model alone does not necessarily translate into salmon habitat attributes, and therefore, more information on the periphery is needed. NMFS, however, must define a finite set of parameters of concern for the periphery. In addition to the WES salinity model, the panel in general felt that it could usefully: 1) Be compared with the Baptista model, using the same inputs. 2) Model other estuarine physical processes (temperature, depth, and velocity). 3) Model a worst-case scenario for low-flow conditions for the period August-September. With these data, panelists concluded that managers would be in a good position to understand physical effects of the proposed project for development of the analysis of biological effects to listed fish. Subsequently, WES and the Oregon Graduate Institute carried out new modeling in response to the comments of the panelists and others. Preliminary results from these models were presented at the August workshop. These results did not indicate substantive differences in the models when deepening was included.

#### **Conceptual Model**

Throughout the review period, the reconsultation parties worked collaboratively to develop a “conceptual model” - an ecosystems-based diagram that illustrates integrated physical and biological relationships for the lower Columbia River that relate to channel deepening. The conceptual model also helped to clarify risks and uncertainties, guide the analysis of effects, and provide a framework for an adaptive management program. The panel cautioned that the conceptual model is not a panacea, but recognized its value as an integrative tool. The panel agreed that the question of what constitutes an “appropriate standard” is a policy decision beyond the scope of the panel’s charge.

Further, the panel agreed that the baseline for evaluating information should be the *current* conditions or state of the physical and biological components and relationships of lower Columbia River ecosystems. The information that is evaluated should be the incremental changes to these current baseline conditions. The magnitude or significance of any current incremental changes to baseline conditions should be evaluated not only in terms of the current variation within the lower Columbia River ecosystems but also in terms of historical physical and biological conditions that originally defined the lower Columbia River ecosystems.

## **Fish**

Reliable, detailed information on how the different Evolutionary Significant Units (ESUs) use the river and estuary is generally lacking. The role of the estuary for feeding and growth of fish is unclear. The pathways for fish contamination and food chain contamination are also not well understood. All of these remain important areas for further investigation. However, it is difficult to link the effects of the project to effects on threatened and endangered salmonids. The panel: 1) Recommended an emphasis in the analysis on some of the more vulnerable species (e.g., ocean-type chinook and chum) as indicators of the impacts of changing estuarine conditions. 2) Endorsed the opinion that the most significant feature of habitat that could be impacted by the project is the amount of diverse habitat (particularly in side channels and peripheral and shallow-water habitats). 3) Noted the possibility of effects of projected reductions in water surface elevation on riverine/wetland habitat loss.

## **Sediments and Sediment Quality**

The panel agreed that the vast majority of material that would be dredged is sand, which is relatively clean and continuously moving in sand waves. The sand has a low surface to volume ratio, is constantly abrading, and not much contamination stays on it. The panel generally felt, therefore, that due to the mid-channel’s relatively clean sediments and low percentage of fine organic material, channel deepening would not stir up a large contaminant reservoir in the channel. Thus, the panel did not see “a clear and present danger” with regard to the impacts of sediment and sediment quality on fish. The panel in general felt there is no reason to believe that the project would increase suspended load, and even if it did, it wouldn’t matter since the sediment is relatively clean. Total organic carbon (TOC) is generally below detection levels in the estuary. Therefore, the panel felt

that TOC was essentially a non-issue, even if suspended on fine sediments, and especially with regard to channel deepening where the sediments are known to be relatively clean. In sum, sediments appear to have little risk, although some uncertainty remains. Therefore, the panel viewed them as a second-order priority.

### **Monitoring and Adaptive Management**

Based on its understanding of the risks and uncertainties of the project, the panel viewed monitoring and adaptive management as essential. However, both approaches need to be flexible, relevant, and of an appropriate scale to the project. In terms of scale of a monitoring program, risks need to be balanced with predictive effects. Issues of high risk and high uncertainty are the first priority of things to monitor; issues of low risk and high uncertainty are a second-order priority. The panel recommended use of a 'decision tree' to determine in advance how results will be used, and endorsed the formal establishment of an 'inter-disciplinary team' to periodically review information and to develop a set of management recommendations, as appropriate. The scope of the team's charge remains to be determined. Some monitoring is already under way that could be integrated with the monitoring needs of the project. Five years is the minimum amount of time for monitoring. Ideally, an adaptive management framework is pursued over the lifetime of the project. Listed fish in side channels and peripheral and shallow-water habitats, within the project area, are the main monitoring priorities. Issues of concern for these habitats include: monitoring of emergent vegetation, fish use and growth, habitat opportunity and quality, wild fish vs. hatchery fish in the periphery, food as a component of habitat.

### **Questionnaire**

SEI compiled a questionnaire, which asked the panel specific questions on technical topics of the project, particularly those where there was past or continuing dispute. The general goal was to obtain the Panel comments on scientific issues of physical modeling and the ecosystem conditions, risks and uncertainties evaluation, monitoring and adaptive management, as well as to guide the prospective agenda planning.

In general, the seven reviewers found the science materials to be comprehensive, and to be adequate to the task of making an informed decision. The reviewers noted that significant progress had been made during the course of the panel process, and that the different parties had examined all issues of significance. However reviewers also noted some areas where more information would be helpful, notably biological issues. There was general satisfaction with the physical modeling that has been carried out.

Panelists were unanimous in their agreement that amount of diverse habitat in peripheral and side-channel areas was among the most scientifically significant issues. The panel (to the most part) agreed with the agency strategy of using ocean-type chinook as a surrogate for the many other stocks in the estuary.

Panelists reiterated their view that physical issues were well understood relative to contaminant and other biological issues. However they evaluated contaminants issues as less risky than habitat alteration.

Panelists endorsed pro-active approaches to lack of information. This included a comprehensive monitoring program, and adaptive management. Although there was considerable variability in response among panelists, they identified the following issues as of highest monitoring interest: Salmonid ecology, prey assemblages, vegetation surveys, and habitat changes. Salmonid ecology was also the issue selected with highest priority for research. It was suggested that monitoring would last for at least five years, with the possible need to modify and extend the program.

### **Parallel processes and next steps**

Parallel to the public workshops, the various parties were engaged in reconsultation meetings and in the preparation of a new Biological Assessment scheduled for completion by year's end. These parallel activities have been addressing, and will continue to address after the close of the SEI panel process, many of the issues raised throughout the panel process. In addition, they will examine some issues not addressed in the SEI process and lay the foundation for a monitoring and adaptive management program. In early 2002, the regulatory agencies will review the Biological Assessment and issue a new Biological Opinion.