

# State and Tribal Fishery Agencies Joint Technical Staff

*Columbia River Inter-Tribal Fish Commission  
Oregon Department of Fish and Wildlife*

Date: October 19, 2006

To: Rich Zabel (NMFS)

From: Rick Kruger, Tim Dalton (ODFW) and Earl Weber (CRITFC)

Subject: Comments on model documentation – “Comprehensive Passage Model” – Version 1.0,

Dear Dr. Zabel:

Thank you for the opportunity to review and comment on the draft documentation for the National Marine Fisheries Services’ (NMFS) Comprehensive Passage (COMPASS) Model – version 1.0, dated October 13, 2006. Oregon Department of Fish and Wildlife (ODFW) and Columbia River Inter-tribal Fish Commission (CRITFC) joint technical staff (JTS) have reviewed the draft documentation and have provided some comments verbally during conference calls. This letter provides JTS’ detailed comments that supplements comments provided previously (May 22, 2006 CRITFC, IDFG, ODFW, USFWS comments on NOAA Response to ISAB comments on COMPASS model; May 22, 2006 CRITFC, IDFG, ODFW, USFWS general comments on COMPASS model; January 25, 2006 CRITFC, IDFG, ODFW, USFWS comments on NOAA COMPASS model; November 4, 2005 CRITFC, IDFG, NPT, ODFW, SBT, USFWS comments on NOAA’s revised Passage Model). To avoid some of the problems that arose previously with the Joint Technical Staff providing comments directly to the Independent Scientific Advisory Committee (ISAB), we request that you provide these comments in the package to be provided to the ISAB for the October 26 ISAB meeting to discuss COMPASS Model documentation.

## **General Comments**

The COMPASS model has been and continues to be developed by NMFS with input from JTS and other Regional parties. The JTS has participated in meetings and conference calls where model structure, function, data, hypotheses and other aspects have been discussed. We are

pleased that there has been a fair amount of convergence as a result of our discussions. However, NMFS has retained and exercised full editorial and technical decision-making authority on all model decisions, therefore ODFW and CRITFC request removal of our names as authors of the model. NMFS initiated model development months before starting consultation meetings with JTS and other Regional parties. Many of our more important concerns remain unresolved. Because of the unresolved issues, and because NMFS and perhaps other federal agencies retain control over the model and the code, we do not consider the process to be collaborative and this should be reflected in the model documentation.

Description and documentation remain sparse in much of the manual. In several places, descriptions of model operations and processes are extremely brief. Examples of areas needing more in depth descriptions include, but are not limited to: 1) past modeling efforts that led to NMFS' development of the current model (present in earlier version but deleted from current version), 2) description or list of potential management options and their effects on survival as expressed in the model (present in earlier version but deleted from current version), 3) more detail of data analyses and model selection, including AIC weights and decisions made by NMFS based on regression models, 4) documentation of how route specific mortality rates are applied to passage probabilities, 5) discussion of the importance of travel time/delay and the use of spill efficiencies to represent delays in dam passage, 6) development of the travel time relationship, 7) hydrologic processes, especially modulation of monthly flow and temperature data into weekly and daily time steps, and 8) discussion of latent mortality hypotheses as well as introduction to potential methods to model effects of potential management actions on this mortality.

Another procedural issue has been the lack of availability of the model. Updates in the manual have been few. Furthermore, model code has been specifically requested by several participants but has not been provided over the last 18 months. To facilitate collaboration on COMPASS and increase understanding and acceptance of model structure and framework, the model code should be made available to all participants. Instead, the model is being developed within an existing (CRiSP) model framework, previously criticized for its complexity and only available to federal agency representatives. We've found this to be a serious shortcoming in the current approach.

As we have little understanding of the model framework, we have concerns about its ability to adequately assess the types of management actions proposed by Oregon and CRITFC as recovery measures and specific actions to address delayed hydrosystem mortality (e.g. spill and reservoir drawdown to reduce delays in fish travel time). Of the four conceptual models listed for reservoir survival, two do not include survival relationships based on spill at either the upstream or downstream dam. None of the models contain a variable for spill at the downstream dam, which could certainly affect upstream reservoir survival. At the same time, the models contain variables such as temperature, for which historic data are unavailable and management actions are limited. We are concerned that COMPASS is over-parameterized and mis-parameterized.

There is potential for concerns over limitations in independence between predictor variables. Also, the models all assume predation to be the primary cause of mortality. This is certainly not an unreasonable assumption, but we would also like to see exploration of potential model forms and variables that are independent of the predation assumption.

We also are concerned about the appropriateness of the dam passage survival component. Clearly, weekly survival data by route of passage route that is necessary to parameterize this component does not exist, and it seems unrealistic to assume that these parameters do not change within a passage season over a range of flow and operational conditions. Without the ability to analyze the interactions between dam parameters and environmental parameters, the ability to separate dam and reservoir survival on anything finer than a yearly scale is highly questionable and analytically flawed. Furthermore, bringing environmental data in for stochastic reasons involves data that either don't exist on a fine time scale or don't exist at all. Questions surrounding the development of these data sets have gone unresolved for many months. If COMPASS is using a "cookie cutter" approach to generate data, then using that same data to explain parameter variability is misleading.

The methodology for assessing the effects of delay seems perhaps optimistic, and, at worst, incomplete. In any case, this approach and methodology needs greater explanation and development in the manual. We are again concerned that the migration rate relationship is over-parameterized. Potentially, this approach could sufficiently model migration rate, and thus fish travel time, essential to addressing delayed mortality hypotheses. However, other proposed mechanisms for delayed mortality, such as the cumulative stress effects of multiple bypass routing, are unaddressed. The manual currently states that the dam passage component is under development. However, initial assessments have demonstrated concerns over the appropriateness of data necessary to do so, and certainly that compiling the data will be a long, intensive task.

### **Specific Comments**

Page 1 (Para. 1): Model objectives versus capabilities.

The model is stated to have certain capabilities that have yet to be demonstrated. Until data and results are provided demonstrating that the model "realistically" simulates fish passage and produces results in agreement with empirical data, the statement about model "capabilities" should be changed to indicate these are the model's "objectives".

Page 2 (Figure 1) and Page 5 (Figure 2): Inclusion of Lower Granite Reservoir.

The passage model algorithm description in Figure 2 indicates fish releases start at the top of each reservoir, however, Figure 1 appears to exclude Lower Granite Reservoir. Effects of the

Lower Granite Reservoir should be included, therefore the release site should be at the top of this reservoir as it is for all other reservoirs. Please clarify how NMFS intends to treat the release site in the Lower Granite Reservoir.

Page 9 (CRITFC model): Description of alternative model form.

The full travel time, with and without distance, model forms have some explanation contained within the documents. Similar explanation of the CRITFC model form is necessary, in addition to the formula. Despite assurances that alternative reservoir hypotheses (conceptual models) would be brought into the COMPASS model, the approach CRITFC proposed was only present in the documentation in the form of one equation. The variable "Spill" for this and the other models was first identified (p. 8) as "proportion of fish passing through the spillway" then on p. 9 as "spill proportion".

In addition, the USFWS presented an alternative model that bears consideration, but no description of it and its advantages and drawbacks has been presented. A discussion of this alternative should be included and NMFS' reasons for not including it should be described.

Page 28 (Section 3.2): Hypotheses on latent mortality.

Descriptions of the alternative hypotheses on latent mortality and how they will be implemented in the model need to be included. This is an extremely important component of the model that needs to be explicitly linked to hydro-action "gap fillers" being proposed in the BiOp remand process. It is our understanding that NMFS will include analyses conducted by Scheuerrell and Zabel and Petrosky et al. that relate fish travel time and post-Bonneville SARs.

Again, we appreciate the progress that has been made and look forward to further progress in both the model and the documentation that will move us toward a more collaborative effort.