

•  
•  
•  
•  
•  
•  
•

# Joint Technical Staff Memorandum



USFWS, ODFW, WDFW, SBT, CRITFC

November 29, 2000

Mr. Frank Cassidy, Jr.  
Northwest Power Planning Council  
P.O. Box 2187  
Vancouver, Wa 98668

Dear Chairman Cassidy:

The joint technical staffs of the state and federal fishery management agencies, the Shoshone Bannock Tribe, and the Columbia River Inter-Tribal Fish Commission have reviewed the recent report entitled, "Review of Survival, Flow, Temperature, and Migration Data for Hatchery-Reared Sub-Yearling Fall Chinook Salmon", by Karl Dreher et al., 2000. We are aware that the NPPC heard a presentation of the Dreher analysis at the recent NPPC meeting in Lewiston, Idaho. The report and analysis were not made available to regional fishery managers for review prior to presentation to the NPPC. We are hopeful that the following joint technical comments will be helpful in the NPPC consideration of the Dreher analysis and presentation.

The Dreher analysis emphasizes three main points: 1) that correlation does not establish causation; 2) that the study design does not allow for the separation of individual variables impacting survival and; 3) that many variables impact survival.

First, we agree that correlation does not establish causation. However, correlation cannot be ignored in a management context when considering survival of endangered and threatened species. In addition, the Dreher analysis considers only one data set from one study and does not consider this data within the context of other data sets and analysis. The summer migrant protection measure is based on a broader scope of information than just the data set considered by Dreher. When the entire available data sets have been analyzed, a flow survival relationship is indicated for adults and juvenile fall chinook.

Second, Dreher states his concern that the study design does not allow for the determination of the effect of a single variable on survival. The specific study design was regionally reviewed by agencies, tribes and independent technical panels in 1989, 1992 and 1996. The concern expressed by Dreher et al relative to the determination of effects of single variables was specifically pointed out by agencies and tribes comments on the study design. This was recognized by the Independent Scientific Advisory Board and the

• • • • •

Independent Scientific Review Panel, as they considered regional technical comments in their separate and extensive reviews of the study design. The regional review process accepted the study design, recognizing that a myriad of interacting variables combine to result in a specific survival estimate. The agencies and tribes advised the NPPC that this study design would not result in a definitive flow survival relationship within a year.

Specifically, the fishery management agencies advised the NPPC, through comments to the Policy Advisory Group, that implementation of this study design would generate indices of survival that over decades might generate a relationship. All of the study design issues have been recognized, considered, and discussed in ISAB and ISRP reviews. The development of annual indices of survival was and is considered valuable to the region. The fact that co-dependent variables are not separable in this study design was recognized and accepted in the ISAB, ISRP review and subsequent regional approval of this study design implementation. In fact, NMFS in their February 1998 Report, entitled "Survival Estimates for the Passage of Juvenile Salmonids Through Snake River Dams and Reservoirs, 1996" states on page 18, *"Identifying and quantifying relationships between environmental variables and survival and travel times of release groups PIT tagged migrant juvenile Salmonids have presented difficult challenges. Chief among these is that fish from a single release group do not migrate as a group, but rather spread out over time. If conditions change over a short period of time relative to the time it takes for the bulk of the release group to migrate through a particular river section, then different fish from the group experience different levels of various environmental factors. In this situation, estimated survival probabilities (defined for the entire release group) are usually valid estimates of average survival for the group. However, it is difficult to accurately quantify the environmental conditions to which the entire release group was exposed and to relate them to the survival estimates. Moreover, if a series of releases is made and migrations are protracted, the various release groups may have considerable overlap in passage distributions, further clouding the relationship between survival probabilities and environmental variables by decreasing the contrast in the levels of exposures among the various groups"*. NMFS recognizes in their analysis the real interactions of variables. The fact that a correlation between survival and flow has emerged from this study design is highly significant from a management standpoint.

In view of these extensive reviews of the study design, we did not anticipate that a specific within year or short term flow survival relationship could result. Furthermore, the agencies and tribes recognize that survival estimates for groups of juvenile fish in short river reaches are not particularly enlightening. The objective and measure of recovery success remains in smolt to adult returns.

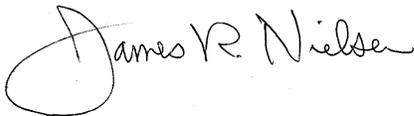
Specifically in the case of fall chinook, a juvenile and an adult flow survival relationship and a juvenile flow travel time relationship has been documented. The joint technical staffs believe that the region is cognizant of the limitations of the applications of specific juvenile survival estimates. However, in the case of fall chinook, the preponderance of evidence supports the establishment of summer flow objectives for fall chinook. In fact a growing body of information indicates that the flow targets for fall chinook should be higher. Co-dependent and interacting variables are a fundamental reality of analysis of ecological systems. Expending great efforts to, or delaying protection in order to tease out the specific impact of individual variables is improvident. This is because in reality all of the variables are interrelated and interact. Actions that increase water velocity will generally decrease water temperature. Ecological systems are too complex to analyze solely in bi-variate regressions. Expending a great amount of time

and funds attempting to separate impacts of variables will not have practical management application because in reality the variables are dependent and do interact. For example, removal of dams on the lower Snake River will increase water velocity, reduce water temperatures, and reduce dissolved gas. These variables interact in reality and cannot be addressed separately in a management context.

The results from these studies which produce juvenile reach survival estimates cannot be considered independently from all of the other studies, analysis and results. One study alone, no matter how well designed, cannot provide a single source definitive solution. All of the available information must be considered together to develop rational protection measures.

In summary, we do not believe that the Dreher et al analysis presents any compelling evidence that diminishes the technical support or basis for the NMFS Biological Opinion measures and the state fishery agency and tribal recommendations regarding provision of flows for juvenile migrants. In fact, we believe that the NMFS study design tends to repress the development of a flow survival relationship for juvenile migrants. This makes the existing flow survival relationship resulting from this study design significant in management considerations.

Sincerely,



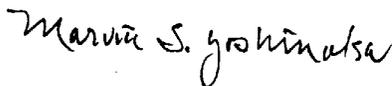
James Nielsen  
WDFW



Bob Heinith  
CRITFC



Charles A. Tracy  
ODFW



Marv Yoshinaka  
USFWS



Keith Kutchins  
Shoshone-Bannock Tribe

cc: Mike Field, Idaho  
Todd Maddock, Idaho  
John Etchart, Montana  
Stan Grace, Montana  
Chip McConnaha  
Erik Merrill