

JUDI DANIELSON
CHAIR
Idaho

Jim Kempton
Idaho

Gene Derfler
Oregon

Melinda S. Eden
Oregon

NORTHWEST POWER PLANNING COUNCIL

851 S.W. SIXTH AVENUE, SUITE 1100
PORTLAND, OREGON 97204-1348

Fax:

503-820-2370

Phone:

503-222-5161
1-800-452-5161

Internet:

www.nwccouncil.org

TOM KARIER
VICE-CHAIR
Washington

Frank L. Cassidy Jr.
"Larry"
Washington

Ed Bartlett
Montana

John Hines
Montana

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TO: RCG Members

FROM: Peter Paquet and Drew Parkin

SUBJECT: The Role of Out-of-Subbasin Effects in Subbasin Planning

Issue

For those subbasins with anadromous fish, how should subbasin planners go about integrating out-of-subbasin environmental conditions and management practices into biological assessments? What information should be provided to planners and how might this information be developed?

Background

Subbasin-level teams are developing subbasin plans to guide future actions aimed at protecting and restoring fish and wildlife resources within all of the subbasins. At the same time, recovery plans are being developed for Pacific salmon listed under the Endangered Species Act. These recovery plans will recommend goals for recovering Evolutionarily Significant Units (ESUs) and actions for achieving those goals. Subbasin plans and recovery plans will be developed through a coordinated, interactive process. These plans must be based on a sound scientific foundation that characterizes the status of listed salmon in the subbasin and identifies the factors that limit their productivity.

Anadromous species spend a significant portion of their life histories outside of their natal subbasin – in the mainstem of the Snake and Columbia, the estuary, and the ocean. Environmental conditions and management practices in these areas have a significant effect on the survival of each anadromous population. Among the environmental conditions that might affect survival are habitat, passage, predation, and competition. Management practices include harvest and hatchery production.

For these anadromous species it is essential that subbasin and recovery planners have an understanding of conditions experienced throughout their life cycle. Of central concern

is the relationship between the number of fish leaving a subbasin and the number returning. The difference is expressed as “out-of-subbasin mortality.” This is a critical number as it is needed to evaluate the potential effects of habitat protection and restoration activities within the subbasin. Also of concern is the relative mortality from each out-of-subbasin environmental condition and management practice. Having an understanding of this can aid planners in making decisions concerning which species and life stages to emphasize in the plan.

In its critique of the draft Clearwater Basin Plan, the independent Scientific Review Panel had this to say about out-of-subbasin conditions:

A strong subbasin plan would endeavor to partition recovery potential for anadromous stocks into the fraction that would be expected from in-basin vs. out-of-basin expenditures of effort. Another approach might be for the subbasin plan to provide a sensitivity analysis of “out of-basin” factors on subbasin goals, i.e., what is needed outside of the subbasin to achieve their goals?

An issue that is of concern at the province, ESU, state, and/or regional levels is the level of consistency in how the various subbasins treat these impacts. This is particularly important when either province-level biological objectives or ESU-level stock viability are being determined.

Policy Issues

A discussion of out-of-subbasin effects gives rise to a host of policy-level issues and controversies. This is due to the fact that there is considerable variation in perspectives on the actual effect of each condition and practice, what actions should be taken, and who should pay the cost. For the purposes of subbasin and recovery planning the issue of out-of-subbasin is viewed as a purely technical matter. To emphasize this point the following safe-guards are offered:

- The scope of this exercise is narrow and technical. The objective is to produce a product that can provide context for subbasin and recovery planning. It is not intended that this product will provide a definitive resolution to the various environmental and management factors that affect anadromous fish survival/production.
- The outcome will not establish any commitments on the part of participating agencies to modify their policies, positions, or management activities related to environmental and management factors relating to survival/production.
- It is not the intent of sponsors or participants to use the outcome as a means to foreclose or otherwise modify ongoing or proposed efforts to improve survival relating to any one of the factors that might be considered. Nor will it affect ongoing or proposed research into scientific issues related to survival/production factors.

- This is not the means to explore and resolve policy-level issues concerning out-of-subbasin conditions. That is left to other venues, namely (1) the Council's mainstem amendment process, (2) implementation of the Federal Hydropower System Biological Opinion, and (3) the U.S. v. Oregon settlement process.

Existing Efforts

There are at least three recent or ongoing activities that have as their aim the definition of out-of-subbasin survival related to out-of-subbasin conditions. These are:

- **EDT Assumptions.** EDT out-of-subbasin survival assumptions were developed by Mobrand Biometrics (MBI) during the Council's Multi-Species Framework Process for use in Ecosystem Diagnosis and Treatment (EDT) analyses. The assumptions take into account multiple effects and are specific to each anadromous subbasin and life stage. Information used in the EDT assumptions originally came from NOAA and are the same as those used in the Hydrosystem BiOp. The product is available now; MBI is in the process of preparing a written summary. (Note that these assumptions are separate and distinct for the EDT model. The EDT model can "plug in" any number of alternative assumptions.)
- **Cohort Model.** The Cohort Model was developed by the Columbia River Inter-tribal Fish Commission (CRITFC). The Cohort Model contains out-of-subbasin effects factors for all anadromous salmonids species and specific to the location of each anadromous subbasin.
- **Age-structure Population Projection Matrix.** This modeling effort is being conducted by NOAA's Northwest Fisheries Science Center (NWFS). It is based on estimates of life-stage specific survival rates and fecundities, using a Leslie Matrix format.

While all of the above efforts make valuable contributions, as presently constituted none of these will suffice for subbasin and recovery planning purposes. Both the EDT Assumptions and Cohort Model need review, possibly updating, and reformatting. While comprehensive, the NWSC product is a work in progress that is available for only a few subbasins and stocks. The NWSC is currently working on the Lewis River subbasin and intends to proceed with similar analyses in other subbasins, with priorities dictated by need. The time required for the NWFS to prepare products depends on the availability of data and technical assistance to secure these data. A rough preliminary estimate suggests that the entire Basin may take up to one year.

Besides the methods and products described above, it should be noted that new run reconstruction products are now available for the John Day, Yakima, and Salmon subbasins. These products produce smolt to adult return information that could be of considerable use in the development of an out of subbasin effects product.

Options for Proceeding

Here are the basic options for proceeding with the development of out-of-subbasin effects products for use in subbasin planning:

- Take no action. That is, have no requirements for how or if to integrate out-of-subbasin effects into subbasin biological assessments. If a subbasin team wishes to integrate out-of-subbasin effects they could proceed using any method and format they desired.
- Recommend that subbasin-level teams include in their plan an out-of-subbasin effects analysis but give no guidance regarding methods or format. Essentially, the only guidance would be the ISRP statement quoted earlier in this paper.
- Leave it up to level II coordination teams in Idaho, Oregon, and Washington to develop a state-specific strategy for incorporating out-of-subbasin effects into subbasin plans that would apply to all subbasins in a given state.
- Select either the MBI or CRITFC product and use this as the basis for out-of-subbasin effects analyses in all anadromous subbasins. (The NWFSC product is not included here as it is not currently available for all subbasins.)
- Craft a strategy and product that draws upon the MBI, CRITFC, NWFSC work and that could be made available for use by subbasin planners in all anadromous fish subbasins within two to three months.
- Engage in a more extensive inter-agency process aimed at preparing a comprehensive product within six to nine months.

Regardless of the strategy chosen, note that MBI has a contract with the Council as part of the Council's Master Subbasin Planning Contract with BPA that calls for MBI to assist the Council in preparing an out-of-subbasin report (Level III contract, task 2.2).

Recommendation

The Council staff recommends proceeding with the second to last option -- a strategy and product prepared within two to three months. Here are the basic tenets:

- The objective would be to provide a set of consistent parameter estimates concerning *current* survival/production of anadromous fish outside of a given subbasin based on existing scientific knowledge and readily available information. The results would be expressed as a range, that is, the low and high survival that could be anticipated under a given set of circumstances. The product would be in a quantitative format capable of being integrated into the various analytical models and processes that will be employed in subbasin planning. The

product would be as simple and straightforward as possible while retaining scientific credibility.

- The product would be developed through a short-term workgroup consisting of the developers of each of the three methods described above (NWFSC, CRITFC, and MBI), as well as technical representatives from the states of Idaho, Oregon, and Washington, should they desire to participate. Other interested parties would be free to monitor progress and attend meetings. The process would be facilitated by Council staff, with technical assistance provided by Mobrand Biometrics, under the existing Level III contract, task 2.2.
- The main vehicle for preparing this product would be a workshop where each of the three existing products/methods would be explained, sideboards/contents for the product would be elucidated, a strategy developed for proceeding, and assignments made. The intent would be to accomplish as much as humanly possible at this workshop.
- The overall goal would be to produce a product, and any related recommendations, in time to be presented at the next Regional Coordination Group meeting (assumed to be in three months).
- The short-term nature of this exercise suggests that results should be considered as an “interim” product for use in subbasin planning. More comprehensive findings are likely to be made available in the future. Proceeding with development of the product described here should not be viewed as precluding use of other more definitive findings as these become available.
- The product would be made available to subbasin planners but, as is the case with other elements of subbasin planning, it would be up to planners to decide how or if to use it. The only requirement would be that the procedures and assumptions be well documented.

Recommendation: Resident Fish and Wildlife

The Council staff recommends that development of parameter estimates for resident fish and/or wildlife be left to subbasin planners in the subbasins where these effects are deemed worthy of attention. (An example of this would be an adfluvial resident salmonid population that spends part of its life cycle in the mainstem Columbia or Snake.) In all such cases planners will be expected to document their decision process, including describing the data that were used and any assumptions or techniques used to fill data gaps.