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Elzie, Teri L

From: Lauri Vigue [VIGUELAV@dfw.wa.gov]
Sent: Thursday, August 03, 2000 9:34 AM
To: Brad Frazier
Cc: Jay McConnaughey; Larry Goldstein
Subject: WDFW Chrom Study Comments



WordPerfect 6.1

Hi Brad

Attached are WDFW's comments on the document entitled "The Potential for Chromium to Adversely Affect Chinook Salmon Under Exposure Conditions Simulating the Hanford Reach of the Columbia, River, Washington". I requested Kevin Amos, Fish Management, Fish Health Division of WDFW to review this document.

Please contact Kevin or myself if you have any further questions.

Lauri Vigue
Washington Department of Fish and Wildlife

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**STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE
FISH PROGRAM
Hatcheries Division**

July 6, 2000

TO: Lauri Vigue

FROM: Kevin Amos

SUBJ: Review of draft report DOE I A No. DE-A106-97RL13570

Lauri, I have received a draft report titled "The Potential for Chromium to Adversely Affect Chinook Salmon Under Exposure conditions Simulating the Hanford Reach of the Columbia River, Washington, USA". I read the report and provided my comments below. Should you or the authors wish to ask questions of my review, please feel free to call me at 360-902-2656.

Report Review

"The objective of this study was to assess the effects of chromium (Cr) on chinook salmon (*O. tshawytscha*) under exposure conditions similar to those of the Hanford Reach of the Columbia River." Having read the objective of the study in the "Summary" section, I assumed that the authors were trying to ascertain whether or not the conditions at Hanford Reach, in respect to Cr, are detrimental to indigenous populations of chinook salmon. After reading the report, I don't believe the experimental design would lead us to answering that question. I think the researchers did a good job in conducting studies on affect of Cr on non-indigenous stocks of chinook salmon and cutthroat trout at McNenny and Jackson facilities, respectively.

1. Levels of exposure - It would have been helpful to provide data to the reader which indicated actual levels of Cr in situ at Hanford with background levels starting at Priest Rapid Dam working down river to the Tri Cities. Reference was made to Hope and Peterson's (1996) and Geist's (1997) studies, however, there is no journal or report number so it is impossible to see their methodology or data. What were actual levels measured in river water at the spawning and rearing locals? In fall, winter and spring? Without the ability to see actual readings from the redds, the reader has to assume that time and level of exposure in the experiments are consistent to what the salmon experience at the Reach.

Experimental animals - I suggest that indigenous stocks of fall chinook salmon should have been used for the study. Had a request been made of WDFW, we would have accommodated the researchers. Different stocks and species of fish may react differently to exposure to Cr. An argument could be made that local Hanford chinook stocks have developed a genetic tolerance to local levels of Cr, or, in the opposite extreme, are more sensitive, thus giving different results in

either case in a bioassay.

Experimental water - While attempts were made in parts of the study to mimic water quality at Hanford Reach, quality on the river is quite different than those experienced at the test laboratories, particularly in terms of settleable and dissolved solids, organics, etc. As I know the authors are aware, the availability and thus the toxicity of Cr is greatly affected by factors in addition to pH and hardness.

Experimental design and approach - With the exception of stock of fish and water quality issues, experimental design looked good.

Results

In Task 3, Fish Health, there is reference to "white markings bordered the kidney". It would be appropriate to describe the nature of the pathological signs observed.

Discussion

The last sentence reads "The significance of these malfunctions is particularly important because they are associated with changes at the population level (growth and survival). Therefore, the health status of resident fish in the Hanford Reach of the Columbia River could be defined these parameters." I suggest it is possible that the health of the resident fish could be defined within the parameters of the pathology observed, however, the health and the increase in the size of the chinook population at the Reach in the last 30 years seems to suggest otherwise.

Perhaps I'm missing something, but if the researchers are trying to determine cause and effect at Hanford, it seems logical to me to first conduct histopathological examinations on fry/fish at the sites where Cr readings are of significance and then follow-up with bioassays with indigenous stocks using Columbia River water at Battelle Labs or Priest Rapids Hatchery.

KHA:kha