



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Fisheries Science Center
2725 Montlake Boulevard East
Seattle, WA 98112-2097

June 11, 2008

Mr. Bill Booth, Chairman
Northwest Power and Conservation Council
851 SW Sixth Ave, Suite 1100
Portland, Oregon 97204-1348

Dear Chairman Booth:

NOAA's Northwest Fisheries Science Center (NWFSC) has reviewed the recommendations submitted to the Council on your 2000 Fish and Wildlife Program (Program) amendments. I am pleased to provide the following additional comments that I believe the Council should consider when developing your new Program.

First, in the very near future there will be a significant amount of scientific information forthcoming on the potential effects of climate change on fish and wildlife resources in the Pacific Northwest. For example, the NWFSC currently has 19 such studies underway and we expect to initiate more in the near future as funding sources become available that are dedicated specifically to studying the effects of climate change. The Program should be designed such that it can receive and incorporate the new information in a flexible, adaptive, and proactive manner. As the information on this important topic builds, strategies for mitigating the effects of climate change may become increasingly important. The Program should be a portal for the new information, but it should also be designed to quickly adjust to this new information and its implications. For example, funding may be needed for innovative projects that develop new strategies for mitigating the effects of a changing climate. These may include measures to protect all sources of cold water (shade and springs) and consideration of building temperature refugia in streams that salmon use for rearing, cold water storage reservoirs and developing underground water storage techniques that provide a source of cooler water during summer that can be reintroduced into streams for salmon and wildlife. In addition, using beavers to restore deeply incised stream channels and natural geomorphologic processes, and removing small dams that block access to additional habitat salmon could use for spawning and rearing as stream temperatures rise and density-dependent effects increase. Concerns about the effects of climate change and the data that will be forthcoming on this topic are both developing rapidly.

Second, toxics are becoming increasingly recognized as an important factor for salmon conservation and recovery. This includes chemical contaminants originating from human activities in decades past (*i.e.*, historically contaminated sites in the Lower Columbia) as well as a wide array of chemicals that reflect current agricultural, residential, commercial, and industrial land uses. Regional human population growth and runoff from roads, parking lots, and other

impervious surfaces are particularly important drivers of degraded water quality in salmon-supporting habitats. The NWFSC has a collaborative research program focused on the impacts of toxics on the health of salmon, the food webs that support salmon, and the long-term viability of ESA-listed populations. In recent years, as part of the Lower Columbia River Estuary Partnership, the Center has been profiling contaminant exposure among outmigrating smolts. The results have shown that salmon are exposed to persistent, bioaccumulative toxics at levels known to cause indirect mortality via increased disease susceptibility. In addition, the Center has made a considerable effort to understand the biological impacts of a range of toxic chemicals commonly found in stormwater runoff. Major findings to date indicate negative impacts on salmon and their supporting food webs. Furthermore, mixtures of common pesticides directly measured in major sub-basins throughout the interior Columbia River Basin have caused synergistic toxicity in juvenile salmon, and modeling studies have linked environmentally realistic pesticide exposures to reductions in the intrinsic productivity of wild populations. Finally, we are investigating the extent to which degraded water quality undermines regional salmon habitat restoration projects that focus primarily on physical and biological processes. This information is being used to develop spatially explicit forecasting models for application to watersheds that are currently experiencing land conversion and other forms of development. Thus, we have a more detailed and sophisticated understanding of how toxics may be limiting salmon recovery than we did just a few years ago that should be considered when adopting new Program language.

I recommend that the Council give some thought to new and innovative approaches in your Program to address both of these increasingly important topics. Thank you for considering these comments. Please contact John Ferguson (john.w.ferguson@noaa.gov) if you have any questions regarding them.

Very truly yours,



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