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December 6, 2002

The Honorable Larry Cassidy, Chairman
Attn: Public Affairs
Northwest Power Planning Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348

Subject: 2002 Draft Mainstem Amendments -- Snake River salmon and steelhead out-migration flows in the Lower Snake and Columbia River

This documentation supplements my testimony presented on the evening of November 19, 2002 at your recent hearing in Boise.

My name is Roy Heberger. I am retired from a career with the US Fish and Wildlife Service (Service). From 1979 to 2000 I worked for the Service in various capacities at its office in Boise, Idaho. Prior to that I worked for 13 years in research for the Service at the Great Lakes Fishery Research Laboratory in Ann Arbor, Michigan.

I present here a statement about a relationship we know to exist and have known to exist for sometime between mainstem flows and survival of Snake River salmon and steelhead.

Here are the facts, as I know them. Under the Fish and Wildlife Coordination Act the Service provides reports concerning fish and wildlife and their habitats to the US Army Corps of Engineers (Corps) to assist in the Corps' planning efforts in the area of water projects. Please forgive me, as I do not recall the exact dates of the work I am about to discuss. A research of agency archives cold unearth this relict report; therefore, I will be as specific as possible about other facts I can recall.

In the early to mid 1980s I was a co-author of a planning aid letter (PAL) from the Service to the Walla Walla District of the Corps. The other author of the PAL was James Nee of the same Service office. A PAL is a preliminary report that precedes a Coordination Act Report (CAR), which is prepared by the Service should the Corps decide further study is needed for a water project that could be authorized by Congress, funded, and constructed.

This PAL was a preliminary report from the Service to the Corps concerning the possible construction of the Galloway Project -- a planned storage reservoir on the lower Weiser River. At the time, the Corps and the Idaho Department of Water Resources, as a local

sponsor, were doing preliminary work to determine feasibility of the project. They were seeking to quantify benefits.

Salmon and steelhead returns to the Snake River were already dwindling prior to the early 1980s. Among others, project purposes for the Galloway Project would have included possible augmentation flow benefits for declining Snake River salmon and steelhead. The flows from Galloway would theoretically be used during salmon and steelhead out-migration through the lower Snake and Columbia River, which by that time already included eight, major water projects -- four on each river. Much later the Service provided a Coordination Act Report (CAR) for the Galloway Project. Its author was Daniel Herrig, also of the Service's Boise office. The Galloway Project was never built.

In the Heberger/Nee PAL the Service needed to explore and evaluate the potential for augmentation flows from a Galloway Project and attempt to quantify a flow/survival benefit for salmon and steelhead in the mainstem Snake and Columbia Rivers. It had not been done for out-migrating Snake River salmon or steelhead at that point in time. So the authors had to use what scientific information they could gather from whatever qualified sources they could find. The National Marine Fisheries Service (NMFS) had been doing mainstem research on salmon and steelhead mortality at those mainstem water projects for a number of years. So we used information collected by the NMFS researchers from Seattle. Flow data were not a problem. Those data were provided by the corps for each year that we obtained project-related fish mortality data from the NMFS. By relating that flow information to matching survival data for the same year for a number of years I developed an initial flow/survival relationship that eventually took the form of a polynomial regression.

Mr. Nee and I presented preliminary results of our work to the interagency mainstem fish group in Portland prior to completing the PAL. After that presentation Mark Maher, then with NMFS, and Nick Iadanza, then with the Corps, also became involved with the further development of the flow/survival relationship. Unless either has retired, I believe Mr. Maher is currently with the Bonneville Power Administration and Mr. Iadanza is with the NMFS -- both in Portland.

What we learned from the work was humbling. The polynomial regression showed an overall quantifiable relationship between mainstem flows and survival for salmon and for steelhead. Generally, as flows diminished so did survival, but it was a curvilinear relationship, not straight line -- hence the polynomial $y = a + bx$. Conversely for the observed data sets as flows increased so did survival. At that time, in an average water year, survivals computed to below Bonneville Dam were as I recall about 13 percent of total estimated smolt out-migration.

What the regression did not do was attribute mortality sources. We could not differentiate from those early data dam-related mortality from reservoir losses, from predation, etc. The data were about what the researchers were able to measure, and it was all lumped as project survival.

The relationship allowed us to compute an average, per-dam survival (not a very useful value really, considering the differences among projects), and from that an overall survival to below each of the eight dams, an example of which is reported above.

The bottom line -- we made an attempt and were moderately successful at statistically relating a direct, curvilinear relationship between mainstem flow and Snake River salmon and steelhead survival. I will say in further support of that claim, that the NMFS researchers using our polynomial regression approach and another year's worth of flow/survival data did publish a peer-reviewed paper the following year. I do not recall where it was published, but its authors are Simms and Ossiander.

That was some time back. The information is much better these days. We're actually now getting lost in arguments about the individual sources of mortality associated with those eight dams. I never cease to be amazed by the distance between scientists and decision makers -- science and politics.

Now here is my opinion -- honestly expressed. I don't think we can have it both ways concerning salmon and dams. If the problem of the dams is not addressed directly then augmentation flows are necessary. The only problem with that is you can't legislate water into existence. Low water years occur, and sometimes successive low water years occur. While I have no doubt that flow augmentation does benefit salmon and steelhead smolt out-migration I think that solution only addresses the symptom, not the problem. The problem is the dams. But until we as a society have the resolve to do what the ecosystem-based Endangered Species Act says we are to do -- recover species in their natural habitats -- I suppose we need to at least stay focused on those symptoms. To me that means augmentation flows.

Now, we have two representatives from each of the four states in the Columbia and Snake River drainage sitting on the Northwest Power Planning Council. I read in the Council's own brochure that it is "an honest broker of diverse interests." I guess we'll see about that, and history will document who did what in relation to salmon and steelhead and when they did it. The question is, " Are you going to do something 'for' or 'to' these dwindling stocks?" There are a lot of history buffs out here in the hinterlands watching, so do your stuff -- honestly.

Sincerely,

Roy Heberger

cc: Idaho Conservation League
Idaho Rivers United
Save Our Wild Salmon
Governor, State of Idaho