October 27, 2015

Will Stelle
Regional Administrator, West Coast Region
National Marine Fisheries Service – NOAA
7600 Sand Point Way Northeast
Seattle, WA 98115

Dear Mr. Stelle:

We are compelled to respond to your recent column in the Seattle Times, "NOAA Fisheries embraces – not ignores – climate research" (August 29, 2015). Your views omit more than they say and so present a misleading and incomplete picture of your agency's unfortunate failure to take aggressive and necessary steps to address the effects of climate change on the freshwater habitat of threatened and endangered salmon and steelhead in the Columbia River Basin. This failure is not new; it has accumulated over nearly two decades of inadequate and ineffective action.

First, a bit of background that should be familiar to you. As the Northwest Power Council's Independent Science Advisory Board (ISAB) pointed out nearly a decade ago in its report, "Climate Change Impacts on Columbia Basin Fish and Wildlife" (ISAB 2007-2), the impacts of climate change on Columbia Basin salmon will be profound. Moreover, even in 2007, these impacts were not obscure or unknown – warming water temperature, alterations in river and stream flows, and reduced ocean productivity were all effects that had been identified and documented. Indeed, many of the scientific studies of these effects cited in the ISAB's 2007 review date back to the 1990s. Subsequently, in 2008, the ISAB also concluded that even NOAA's worst-case scenario for assessing the potential effects of future warming ocean temperatures was not "sufficiently pessimistic." (ISAB 2008-1 at 3.[1]) To be sure, our understanding of climate change impacts on salmon has advanced and become more refined over the past five to ten years, but no one – least of all NOAA – can credibly claim that the increasing impacts of climate change on Columbia Basin salmon and steelhead is unforeseen or a surprise.

Second, you are correct that NOAA Fisheries has been a leader in *conducting* climate research and analyses. For example, its scientists have been lead or co-authors of numerous studies examining:

- the physical and biological impacts of climate change in freshwater, e.g., Crozier 2008; Crozier & Zabel 2013 (projecting different decreases in survival for Snake River spring/summer Chinook), Wu, *et al*. (2012) (projecting decreased summer stream flow of nearly 20% in 2020s to over 30% by 2080s and increases in summer stream temperatures from 0.92°C to 2.10°C);

- the shrinking ocean habitat, Abdul-Aziz 2011 (large contraction of 30% to 50% by the 2080s of the summer thermal range suitable for chum, pink, coho, sockeye, and steelhead in the marine environment, with an especially large contraction (86% to 88%) for chinook);

[1] ISAB 2008-1, "Review of the Interior Columbia River Technical Recovery Team's Analyses of Survival Changes Needed to Meet Viability Criteria" (Mar. 7, 2008).

- the effectiveness limitations of various freshwater habitat actions to address climate change, Beechie 2012 (only certain kinds of stream habitat restoration like shading and increases in flows can address climate effects); Wade 2013 (habitat protection alone will not save the species); and

- the need to consider whether any potential benefits from habitat restoration actions will be overtaken by the effects of climate change, Battin 2007.

Third, what NOAA has failed to do – and repeatedly – is actually *apply* the results of its research on climate change and salmon to support the major changes to dam operations that are necessary if we are going to continue to have wild salmon and steelhead in the Columbia and Snake Rivers in a climate change world. The recitation of NOAA's "actions" to address climate change in your column does a good job of highlighting this failure:

(1) You point out that this summer fish managers were engaged in a last minute, *ad hoc* effort to address river temperature problems that we have known about for years, even decades. For example, over a decade ago the U.S. EPA conducted modeling to show that the reservoirs behind the four dams on the lower Snake River are the most significant contributor to increased water temperatures in the lower Snake River that are harmful to salmon. In 2013, we lost over one-third of the returning adult Snake River sockeye because of hot water in the adult fish ladder at Lower Granite Dam. The federal agencies decided then to jerry-rig pumps to get cooler water into the adult ladder but they failed for two years to undertake that work and faced the same problem again this summer. You also point to the cool water releases from Dworshak dam as part of the effort to address warm water this year. What you don't say is that these releases are limited in both quantity and timing, and that they can only cool the River to a small degree and for a short distance. At best, they are a minor band-aid on a major temperature problem. And even then, using this limited cool water earlier this year – which you identify as an appropriate response – exposes later-migrating salmon like Fall Chinook to even greater risks. In short, the measures you identify amount to tinkering around the edges of the water temperature problems salmon face, with a very limited range of options, because we have avoided major change at the dams, changes that should have been made starting years ago.

(2) You also invoke the ISAB's climate recommendations as justification for the habitat restoration and other measures NOAA and other federal agencies are pursuing to address climate impacts. What you don't explain is that the actions in the federal salmon plan you describe are in the plan as an attempt to mitigate for the harmful effects of dam operations – and all of their hoped-for benefits are accounted for to meet this need. They are not there to mitigate for the *additional* impacts of climate change. The benefits of an action – even if they exist – can't be counted twice to address to two different and additive problems. The question isn't whether certain kinds of actions are generally good things to do in the face of climate change. The question is whether the agencies are implementing enough of the right kinds of the actions in the right places, with sufficient benefits to mitigate for *both* the harm from the dams *and* the additive adverse effects of climate change. The federal plan you point to doesn't tackle this problem at all even though in other plans (like your agency's recent biological opinion for the Central Valley Project in California) NOAA has considered both threats and identified separate and

additive actions to address each. Of course, the ISAB report you cite makes it very clear that climate change impacts are *additive* – they occur independently or on top of other impacts – and it stresses that failing to understand the magnitude of the additional climate impacts and their implications for other mitigation efforts is "like driving down the road looking in the rearview mirror while accelerating."

(3) Likewise, the precautionary 11% to 44% reduction in ocean survival you say NOAA has used as part of a conservative approach to salmon restoration is a reduction only in comparison to the admittedly unreasonable assumption that future river conditions will be like those salmon experienced historically over the last century and more – without climate impacts. The current and future effects of climate change ensure that those days are not returning. NOAA has known (since the ISAB told the agency in 2008) that reduced salmon survival as a result of continuing and expanding climate impacts is likely to be far worse than the 11-44% "mid-range" reduction NOAA assumed. It was unreasonable and untenable for NOAA to assume only this mid-range (and comparatively small) decrease in survival in 2008 in light of the ISAB's clear advice. NOAA's continued reliance on this assumption even in the face of (its own) more recent scientific analyses – some noted above – is hardly grounds for asserting that the agency is pursuing a cautious approach to climate impacts on salmon restoration.

(4) Finally, we agree that protecting wetlands, floodplains and other important salmon habitat is useful and important, but these kinds of actions are simply nowhere near sufficient to mitigate for the harmful effects of dam operations and the slack water reservoirs they create in the Columbia and Snake Rivers. And such actions will be even less effective as the effects of a warming climate continue to increase. We must address the problem Columbia and Snake River salmon and steelhead face at the source: the dams and reservoirs that have had and continue to have such a profound impact on their survival.

Yes, as you say, this has been a tough year for our wild salmon. But all of the best science indicates that the future is likely to bring many more such years and more often. If we are to avoid losing endangered Snake River sockeye or threatened Snake River spring/summer Chinook – or any of the other imperiled species of salmon and steelhead in the Columbia basin – we need to be doing far more than following the processes and going through the motions you describe in your column. If the dead salmon up and down these rivers this summer did nothing else, they gave us a clear and unmistakable warning that continued reliance on the kinds of small steps and minimalist measures we have taken since Snake River sockeye were first listed under the Endangered Species Act over twenty years ago will not work.

Sadly, the loss of salmon this summer is not our first warning. In 1994, federal Judge Malcolm Marsh rejected the first of five subsequent federal plans for dam operations – all but one a failure – because the plan settled for minor adjustments when, in the Court's words, "the situation literally cries out for a major overhaul." We have now lost twenty years of lead time to heed the Judge's warning. And yet the salmon are still waiting for that "major overhaul." Your column does a major disservice to the urgency of the challenge we face. We believe it is imperative to heed the science, change course, and pursue a plan for salmon restoration that squarely faces the

need for major changes in both the existence and operation of the federal dams on the Columbia and Snake Rivers.

Sincerely,

Rod Sando
Former Chief Executive of Natural Resources for Minnesota
Former Director of Idaho Fish and Game Department

Don Chapman, Ph.D.
Fisheries Biologist (Retired)

Douglas A. DeHart, Ph.D
Former Fisheries Chief, ODFW
Former Senior Fisheries Biologist, USFWS

Daniel H. Diggs
Former Assistant Regional Director for Fisheries
U.S. Fish and Wildlife Service

Jim Martin
Former Chief of Fisheries
Oregon Department of Fish and Wildlife

Steve Pettit
Fisheries Biologist (Retired)
Idaho Department of Fish and Game

Bill Shake
Former Assistant Regional Director of Fisheries
U.S. Fish and Wildlife Service

Don Swartz
Fisheries Biologist (Retired)
Oregon Department of Fish and Wildlife

CC:
Northwest Governors
Northwest Senators
Northwest Representatives

Eileen Sobeck, Administrator, National Oceanic Atmospheric Administration

Gina McCarthy, Administrator Environmental Protection Agency

Dennis McLerran, Administrator, Region 10, Environmental Protection Agency

Jo-Ellen Darcy, Assistant Secretary of the Army (Civil Works)

Elliott Mainzer, Administrator, Bonneville Power Administration

---

References

Abdul-Aziz, O. I., N. J. Mantua, and K. W. Myers. 2011. Potential climate change impacts on thermal habitats of Pacific salmon (Oncorhynchus spp.) in the North Pacific Ocean and adjacent seas. Canadian Journal of Fisheries and Aquatic Sciences 68:1660–1680.

Battin, J. M. Wiley, M. Ruckelshaus. M. Palmer, E. Korb. 2007. Projected impacts of climate change on salmon habitat restoration. Proceedings of the National Academy of Sciences 104:6720–6725 (0).

Beechie, T., H. Imaki, J. Greene, A. Wade, H. Wu, G. Pess, P. Roni, J. Kimball, J. Stanford, P. Kiffney, and N. Mantua. 2012. Restoring salmon habitat for a changing climate. River Research and Applications. Online prepublication wileyonlinelibrary.com DOI:10.1002/rra.2590.

Crozier, L. G., R. W. Zabel, and A.F. Hamlet. 2008. Predicting differential effects of climate change at the population level with life-cycle models of spring Chinook salmon. Global Change Biology 14:236–249, 1/1/2008.

Crozier, L., and R. Zabel. 2013. Population responses of spring/summer Chinook salmon to projected changes in stream flow and temperature in the Salmon River Basin, Idaho. In: Life-cycle models of salmonid populations in the interior Columbia River Basin. DRAFT. June 28, 2013. Northwest Fisheries Science Center.

Wade, A., T. Beechie, E. Fleishman, N. Mantua, H. Wu, J. Kimball, D. Stoms, and J. Stanford. 2013. Steelhead vulnerability to climate change in the Pacific Northwest. Journal of Applied Ecology 50:1093–1104. Wainwright, T., and L. Weitkamp. 2013. Effects of climate change on Oregon coast coho salmon: habitat and life-cycle interactions. Northwest Science 87:219–242.

Wu, H., J. Kimball, M. Elsner, N. Mantua, R. Adler, and J. Stanford. 2012. Projected climate change impacts on the hydrology and temperature of Pacific Northwest rivers. Water Resources Research 48: W11530 doi:10.1029/2012WR012082.