

Thank you for this opportunity to comment today. My name is Daniel Schindler; I am a professor of fisheries and aquatic sciences at the University of Washington. I have worked extensively on salmon fisheries in western Alaska for over 20 years, and our research program at UW has performed research on Alaskan salmon and their habitat since the late 1940s. My comments today derive from this collective experience which sheds light on what is unique about Alaskan fisheries and fish habitat, compared to the situation we have here in the lower 48 states.

It is gratifying to see that Alaska is finally having a serious conversation about the adequacy of its current laws to protect habitat for fish and wildlife throughout the state. There are few places left in the world where the connections between people and the land-and-water are as real as they are in Alaska. Commercial, subsistence, and sport fisheries have been sustained for decades to millennia, and there is no reason to believe that these activities and the economies and cultures they support will not continue into the future – but only if we provide adequate habitat protection and maintain responsible management.

The primary reason that Alaska's rivers and lakes are so productive is because the habitat is largely undeveloped, vast, and diverse. Current regulations are intended to protect the most important habitat for fish and wildlife, but what we have learned after decades of study in western Alaska, is that it is extremely difficult to identify what is critical habitat and what isn't. Some tributaries may be unproductive for decades while other tributaries produce most of the fish, and then suddenly the importance of these tributaries can switch. Tributaries can flip back and forth between being important and sitting somewhat dormant, and then back again. So what makes Alaska's rivers so productive and reliable is that the full complement of habitat remains present. The diversity of habitat stabilizes the overall productivity and reliability of these systems. Eroding this diversity of habitat, that could happen with inadequate protection, runs the distinct risk of making fisheries much less productive and reliable in the future.

I could go on at length about the ecological and environmental reasons for strengthening protection for fish and wildlife in Alaska. However I am sure that many of the voices you have heard from with serious reservations about this bill have made their arguments in economic terms. Thus, it is important to reflect on what the economic value of intact habitat might be.

Using Bristol Bay sockeye salmon as an example, the economic value of this fishery has been estimated at over \$1.5 Billion per year. A large fraction of this revenue remains in-state. What is not widely appreciated is that the total amount of expenditures supporting research and management is less than a couple million dollars per year. So, hundreds-of-thousands of dollars of revenue are generated for every dollar spent on research and management. This is a remarkable return-on-investment by any standard, and it is only possible because of the quality of the habitat that produces fish. Sustainable management of fisheries in Alaska by the Alaska Dept of Fish and Game is the envy of the world in many regards – but productive and intact habitat is what makes this sustainable management even possible!

For comparison, let's look at the Columbia River here in the Pacific Northwest. More than 500 million dollars are spent every year on research, management, restoration, mitigation, compensation, etc. These funds are spent to make up for lost or degraded fish habitat, particularly for salmon.

The value of fisheries in the Columbia is generously estimated at a fraction of this investment; for every dollar spent on research and management, less than a single dollar of economic revenue is generated. That giant sucking sound you may hear from the Pacific Northwest is from all of the dollars being spent by citizens and tax payers to try and prop up the fisheries and habitat that we have turned our backs on here.

So how did we end up in this predicament here in the Pacific Northwest? We made some assumptions about how we could develop rivers for hydropower, agriculture, urbanization, mining, forestry, etc., that have turned out to be massive mistakes from which we are not likely to recover from any time soon.

In particular, we assumed that:

- Fish habitat needs minimal protection

We also assumed that

- large-scale restoration is possible in places where habitat is degraded

And that

- hatcheries can make up for destroyed habitat.

And last:

- We didn't sufficiently protect habitat simply because we assumed that we knew what we were doing.

Of course, we couldn't have been more wrong on all accounts.

There are many scientific, environmental, social, and economic reasons to improve protection for fish and wildlife habitat in Alaska. This is a remarkably wise investment. It does not come at an economic cost as so many tend to argue. Restoring and mitigating for lost and degraded habitat is unfathomably expensive and largely ineffective. Alaska is in the driver's seat here to make decisions that the rest of the US made dreadfully wrong. You have the opportunity to do it right!

Thank you.

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Daniel Schindler, April 10, 2018 invited testimony on Alaska HB 199. By phone.