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2/12/2024

House Committee on Environment and Natural Resources
Oregon State Legislature
900 Court St. NE,
Salem, OR 97301

Committee Members,

I would like to provide the following information to supplement my testimony in in opposition of SB 1590 for the Senate Natural Resources and Wildfire Committee on February 13, 2024. The testimony I will give is consistent with the testimony I presented to the House Committee on Environment and Natural Resources on February 21, 2022.

In past discussions in the Legislature about the potential effects of wake boats in the Willamette River, some have questioned the presence of juvenile spring Chinook salmon in nearshore habitats of the river during spring and summer.

Available scientific data from the Willamette River clearly demonstrate that:

1. **Shallow margins of the Willamette River are the primary habitats for juvenile Chinook salmon and steelhead.**
2. **The greatest proportion juvenile Chinook move past Willamette Falls in June.**
3. **ESA-listed juvenile spring Chinook salmon and steelhead are present in the edge habitats habitat during periods when large-wake-producing boats are using the Willamette River.**
4. **Large wakes produced by wake boats have significant potential to negatively affect juvenile salmon, steelhead, and associated aquatic communities of the Willamette River.**

Presence of juvenile Chinook salmon and steelhead
Data from a variety of sources (Oregon Department of Fish & Wildlife, USGS, OSU research) clearly document the presence of juvenile salmon in edge habitats along the Willamette River during the period of recreational wake boat activity. The following graph illustrates the monthly movement of juvenile past Willamette Falls (Figure 1). The majority of juvenile Chinook salmon migrate through the Willamette River below Newberg in June. ODFW research has documented juvenile salmon in the lower Willamette River every month of the year (Friesen et al. 2004, 2007). My OSU research team has sampled the lower river and captured juvenile spring Chinook salmon along the river margins in May through July. Temperature limits on my sampling permit would not allow sampling during August. The data clearly demonstrate that juvenile spring Chinook salmon are present in the lower Willamette every month of the year, including the period from late spring through summer.

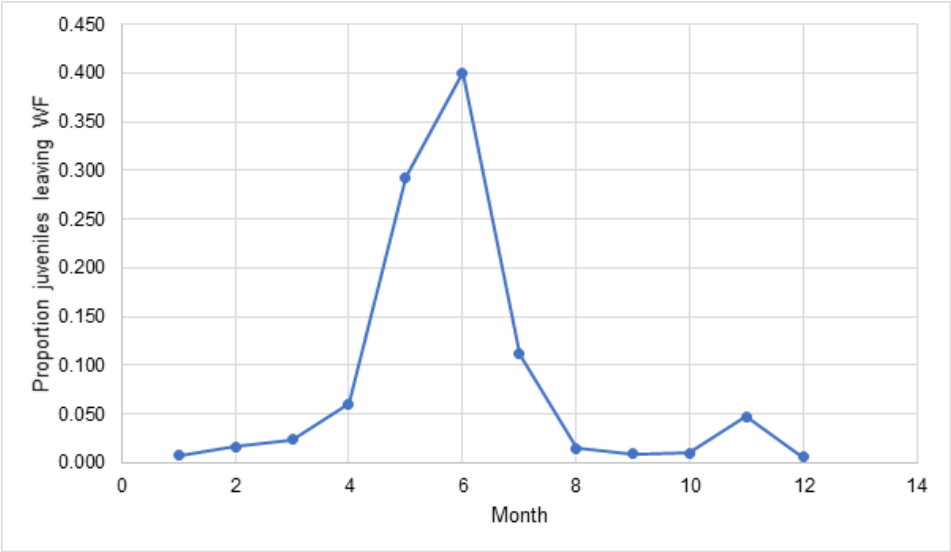

Figure 1. Monthly proportion of annual migration of juvenile Chinook salmon past Willamette Falls based on PIT-tagged juveniles detected at Willamette Falls from 1999 to 2018 (data provided by Dr. James Peterson, USGS Oregon Cooperative Fish and Wildlife Research Unit). Data points represent proportion of juvenile Chinook that passed Willamette Falls in each month of the year.

A recent ODFW study tagged 11,600 juvenile Chinook salmon in the mainstem Willamette, lower Santiam, North Santiam, South Santiam, and McKenzie Rivers from 2002 to 2015 (Whitman et al. 2017). They found the average migration date at Willamette Falls (WF) for fish tagged in different reaches was:

Tagging Location	Average Date at WF	Range of Tagged Fish Passage at WF
Mid-Willamette	**June 3**	**May 11-June 27**
Upper Willamette	**June 11**	**May 20-June 30**
Santiam River	**June 17**	**May 29-June 28**
North Santiam	**July 3**	**June 18-July 15**
South Santiam	**June 23**	**June 11-29**
McKenzie River	**June 17**	**June 2-July 3**

These empirical data demonstrate that ESA-listed juvenile spring Chinook salmon are present from Newberg to the mouth of the Willamette River during the season of wake boating activity. This species is subject to protection under the Endangered Species Act.

Shallow margins of the Willamette River provide the primary habitat for juvenile salmonids in the Willamette River. Studies by ODFW, USGS, and OSU research have documented habitat use of juvenile Chinook salmon in the Willamette River. USGS and ODFW researchers (Toby Kock and Jim Peterson, USGS, personal communication) recently developed habitat suitability criteria for juvenile Chinook salmon and steelhead. They concluded that juvenile Chinook salmon are found primarily in

depths of less than 3 feet
slopes less than 0.5%
velocities less than 1.5 feet/sec

Steelhead juveniles are found in depths slightly more shallow than those observed for juvenile Chinook.

Importance of river margins for aquatic productivity

The margins of the Willamette River are more than simply habitat for spring Chinook salmon, steelhead, and other fish. The river margins provide critical food resources for all species of fish and invertebrates every month of the year. Algae on the river substrates in the shallow edges receive abundant sunlight for photosynthesis, providing food for aquatic insects and other invertebrates that are food for the fish community. During lower flows in summer, activities that create suspended sediments and turbidity can blanket the river gravels block sunlight, decreasing the production of food for aquatic communities. Erosion caused by large wakes during spring and summer can cause increased suspended sediments during a period of low flow and critical aquatic productivity.

Spring and early summer as critical season for aquatic biota

In previous discussions of the effects of large wakes from wake boats, it has been suggested that there is no difference between the erosive and disruptive effects of large wakes and the higher velocities that occur during winter high flows. This confuses effects of velocities along the river during winter high flows with the effects of large boat wakes during the low flows of spring and summer in the Willamette River. But even more importantly, it ignores the very important ecological differences between winter season and the productive period of spring and early summer. Numerous studies have documented lower food production in winter and the lower growth rates of fish as compared to spring and summer. Fish growth is highest in spring and early summer when aquatic insects are emerging and temperatures are cooler than in mid to late summer. Primary production by algae and other aquatic plants increases sharply in the spring and early summer. Ecological consequences of erosion and sedimentation differ substantially during these two seasons.

Existing scientific evidence clearly demonstrates that ESA-listed juvenile salmonids are present in the reach below Newberg during periods when large-wake-producing boats are using the Willamette River. Shallow margin habitats of the Willamette River are critical habitats for juvenile Chinook salmon and steelhead and provide critical food resources for aquatic communities.

Thank you for the opportunity to discuss the importance of river margin habitats for aquatic communities in the Willamette River. References for the information presented above are provided below.

Respectfully,

Dr. Stan Gregory
Emeritus Professor
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References:

Friesen, T. A., J. S. Vile, and A. L. Pribyl. 2004. Migratory behavior, timing, rearing, and habitat use of juvenile salmonids in the lower Willamette River. Pages 63-137 in T. A. Friesen, editor. Biology, behavior, and resources of resident and anadromous fish in the lower Willamette River. Final Report to the City of Portland. ODFW, Clackamas.

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Peterson, J. T., J. E. Pease, L. Whitman, J. White, L. Stratton-Garvin, S. Rounds, and R. Wallick. 2022. Integrated tools for identifying optimal flow regimes and evaluating alternative minimum flows for recovering at-risk salmonids in a highly managed system. River Research and Applications, 38: 293– 308.

Whitman, L. D., R. K. Schroeder, and T. A. Friesen. 2017. Evaluating migration timing and habitat for juvenile Chinook salmon and winter steelhead in the mainstem Willamette River and major spawning tributaries. Final Report to the U.S. Army Corps of Engineers. Oregon Department of Fish and Wildlife, Willamette Research, Monitoring, and Evaluation, Corvallis Research Laboratory.