

Department of Fisheries and Wildlife

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Oregon River Safety and Preservation Alliance and Willamette Riverkeeper,

After our discussion about the potential erosional effect of wake-producing boats, I want to explain why ecological effects on shallow nearshore habitats potentially are equal or greater concerns for the aquatic ecosystem of the Willamette River. The questions you raised about bank erosion, damage to property, riparian plant communities and wilde are valid concerns. Such impacts may become more severe as sizes of wakes and numbers of recreational boats increase.

I think an equal or greater impact of wake-producing boats is the disturbance to aquatic communities in the shallow nearshore habitats of the Willamette River. These habitats are important for the production of food resources and providing essential habitats for aquatic insects, freshwater mussels, early life stages of all native fish species, and adult native fish.

One of the primary sources of food for the aquatic food webs of the Willamette River is benthic algae, which are attached to the gravels and other bottom substrates of the river. The nearshore habitat is especially important for their productivity. Their photosynthesis is greatest at higher light intensities, but light intensity decreases with water depth. Therefore, the shallow habitats support the highest levels of benthic primary production. The turbulence and velocity of the wakes will scour algae from these surfaces, reducing primary production. In addition, the silt and fine sediments suspended by the wakes will coat these benthic communities and block light for their photosynthesis. During low flow periods, these sediments will not be removed as readily.

These nearshore habitats also are habitats with lower velocity. Such habitats with productive algal communities and lower velocities are important for aquatic invertebrates, which are the primary food resources for many native fish. In addition, these aquatic insects emerge from the river to reproduce in their terrestrial stages, providing essential food resources for bird and bat communities along the river. The erosional effects of the wakes and deposition of silt affect their survival, as well as that of their algal food resources. The turbulence and frequent disturbance dislodge them and move them to less suitable habitat or increase their risk of predation. Freshwater mussels are another important invertebrate in the Willamette River and may be affected by the disruption of the nearshore habitats. These organisms filter particles from the water to feed, but suspended sand and silt decrease the quality of their food by diluting it with undigestible inorganic material. These silts also reduce their ability to respire or breathe. The margins of the Willamette River are critical for the production of invertebrate communities and wakes can have substantial negative impacts.

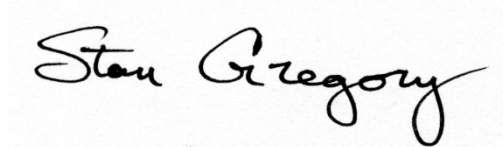
The early life stages of almost all native fish species in the Willamette River are restricted to the lower velocities of the shallow nearshore habitats. Anyone who has walked along the river has seen the numerous young minnows, suckers, sculpins, and trout along the edges. These are the nurseries for the fish populations of the Willamette. Turbulence and waves created by wakes can disturb them and make the

lifvulnerable to large predators when they become momentarily disoriented. These habitats normally provide relatively stable flow conditions, and fish generally avoid frequently changing hydraulic conditions.

Juvenile Chinook salmon and steelhead use the margins of the Willamette River for rearing habitat and migration. Subyearlings, in particular, are found in these shallow, low velocity areas. Studies by Tom Friesen of ODFW and our OSU research team have found that juvenile Chinook salmon are found mostly in shallow habitats with gradually sloping bottom adjacent to the shore. These habitats are particularly susceptible to the amplified alteration of depth, velocity, and turbulence by wakes from boats. Increasing disruption of the critical habitats of juvenile salmonids along the Willamette River by wake-producing boats should be a concern to state and federal fish management agencies as well as the general public.

As I mentioned initially, the erosional effects of the increasing numbers and wake magnitude potentials of recreational boats is clearly an important issue for land owners along the river, the public, and resources management agencies. In my professional opinion, the ecological effects of these wake-producing recreational activities are an even greater concern. Greater attention to this issue and studies to better inform decisions are needed to protect these important resources for the people of Oregon.

Pease contact me if you have additional questions,

A handwritten signature in black ink that reads "Stan Gregory". The signature is written in a cursive style with a large, sweeping "S" and a long, trailing "y".

Dr. Stan Gregory
Emeritus Professor
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Oregon State University