Testimony in Support of Senate Bill 3 before the

Senate Committee on Environment and Natural Resources

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Thank you for the opportunity to present testimony in support of Senate Bill 3 and an expanded moratorium on suction dredge mining in Oregon streams. I represent Trout Unlimited, a national non-profit organization dedicated to the conservation of coldwater fishes, such as trout and salmon, and their habitats. Trout Unlimited has more than 3,000 active members in Oregon. Our approximately 155,000 national members are divided into local chapters that monitor the quality of their streams, conduct fishing clinics, teach our youth outdoor skills and ecological training, and implement stream restoration projects. In 2016, our members provided approximately 725,000 volunteer hours of community and ecosystem service across the country.

My testimony addresses the need to increase protection to streams tributary to essential spawning and rearing habitat for salmon, steelhead, Pacific lamprey and bull trout in Oregon. Section 1 of SB 3 provides that tributaries located above the lowest extent of essential habitat would be included within the moratorium. We agree that headwater tributaries of spawning habitat should be afforded the same protection as provided for the spawning areas themselves if we are to conserve these fisheries.

Tributary streams generally are underappreciated for the role in supporting and increasing the productivity of downstream rivers. We note the following values of headwater tributaries that are important to the conservation of downstream spawning and rearing habitat for salmon, lamprey, and bull trout.

1. **Headwater tributaries are the primary connection between larger spawning and rearing streams and the terrestrial environment.** Tributary streams are the primary source areas for downstream sediments, gravels, nutrients, invertebrates, and large woody material that support downstream fish populations (Gomi et al. 2002; Benda et al. 2004).

2. **Tributary streams are primary sources of cold water for trout and salmon bearing streams.** Even ephemeral or intermittent streams can provide important sources of cold, subsurface flows that support spawning areas for coldwater fishes in downstream rivers. One study of northeastern Oregon rivers found cold-water patches at 53% (36 of 68) tributary confluences examined (Ebersole et al. 2015). Of these, 14 tributaries had no flowing surface water with all the coldwater provided by subsurface flows.

3. Tributary streams are primary sources of food for trout and salmon bearing streams. One study in Alaska found that fishless headwater streams produced about half of the aquatic insects consumed in downstream rivers (Meyer et al. 2003). In Washington state, salmon and steelhead in the Methow River were found to be primarily supported by prey items produced in side channel and tributary environments (Bellmore et al. 2013).

4. Tributary streams provide essential ecosystem services to ecosystems and communities. These ecosystem services include sediment storage, pollution control, nutrient recycling, flood control, water storage, and groundwater recharge of aquifers. Tributary streams have been found to store fine sediments for decades and prevent these fine sediments from choking downstream spawning and rearing habitats (Meyer et al. 2003). Headwater tributaries process and retain excess nutrients, such as phosphorus and nitrogen, and help buffer impacts from activities occurring in terrestrial, upslope areas.

5. Headwater streams are important for their sheer quantity. Headwater tributaries are the most numerous component of the stream network. Tributaries are the building blocks for our larger streams and rivers. They literally make the larger rivers. Despite their small size, headwater streams typically drain between 70-80% of the entire watershed area (Meyer et al. 2003).

6. During high runoff years, many typically smaller tributary streams will support limited spawning and rearing habitat for salmon, steelhead, lamprey, and bull trout. For instance, coho salmon often spawn in streams less than 1 meter in width and less than 10 cm deep. Juvenile salmon may utilize low-gradient tributary habitat for rearing even if spawning occurs in larger stream channels. Because of their importance for juvenile coho salmon rearing, small tributary streams are ranked highly as important salmon restoration sites (Beechie et al. 1994).

7. Tributary streams are important sources of biological diversity, especially for salamanders and other amphibians, aquatic insects. These streams can provide from 25-100% of emerging insects consumed by organisms such as bats, birds, and salamanders (Baxter et al. 2005).

The condition of tributary streams determines their ability to provide the services described above. Habitat complexity – especially inchannel complexity provided by large wood, boulders and gravels -- is very important to maintaining values in tributary streams. Connectivity also is important for maintaining downstream values, including connections between streams and riparian habitats, and between streams and their floodplains.

Dredging, channelizing, removing instream structure, introducing pollutants, and loss of riparian vegetation are the most common causes of stream degradation. Restoration actions often focus on increasing the quality and quantity of instream structure, and reconnecting stream and upland areas.

The most recent National Rivers and Streams Assessment (EPA 2016) reviewed data available from 1.2 million stream miles from smallest headwater streams to largest rivers. EPA (2016) found that 46% of our nation's streams were in poor biological condition, 25% in fair condition, and 28% in good condition. What were major drivers of poor stream condition: >40% of streams had nutrient pollution problems, 24% had poor quality riparian vegetation, 20% had high levels of riparian disturbance, and 15% had

excessive fine stream sediments. These drivers of reduced stream condition are exactly the kinds of problems that can be addressed by protection of our tributary streams.

Suction dredge mining contributes to the drivers of stream degradation by mobilizing fine sediments and sending them downstream, by releasing pollutants to downstream areas, and by removing inchannel structure. These pollutants can include mercury, a neurotoxin that is normally sequestered in deep stream sediments and inaccessible to fishes, but is mobilized and distributed downstream with the fine sediment plume behind suction dredges (Fleck et al. 2001).

What does this mean? It simply means that the condition of our larger rivers is a reflection of the condition of their headwater tributaries. If we do not protect headwater tributary streams, we cannot provide the high quality salmon, lamprey, and bull trout spawning and rearing habitat that is desired. For these reasons, I encourage additional protections from suction dredge mining in upstream tributaries of spawning streams for salmon, lamprey, and bull trout.

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