From the Desk of
Rep. Michael Dembrow

WILD SALMON CENTER

To: Senate Committee on Environment and Natural Resources
Senator Michael Dembrow, Chair
Senator Alan Olsen, Vice-Chair
900 Court St. NE
Salem, Oregon 97301

RE: TESTIMONY ON OREGON SENATE BILL 3

Chair Dembrow, Vice-Chair Olsen, and Members of the Committee:

Thank you very much for the opportunity to provide testimony regarding Oregon Senate Bill 3. My name is Matthew Sloat and I am the Director of Science for Wild Salmon Center, an Oregon-based conservation organization that promotes the conservation and sustainable use of wild salmon ecosystems across the Pacific Rim. As the chief scientist at Wild Salmon Center, I engage in applied research to inform the conservation and restoration of salmon, steelhead, and trout populations. My background includes a Ph.D. in Fisheries Science from Oregon State University. For the past 20 years I have studied relationships between native trout, salmon, and their habitats in the Rocky Mountains, the Pacific Northwest, and Alaska.

As a scientist with expertise in salmonids and watershed science, I am very familiar with the scientific literature concerning the effects of suction dredge mining on rivers and streams. This literature provides evidence for a broad array of net-negative effects of suction dredge gold mining, including effects on stream morphology and aquatic habitat, federally-listed fishes and freshwater mussels, and the potential for human health concerns related to legacy mercury mobilization. Here, I will focus my testimony on the following findings that are particularly relevant for Oregon's salmon, steelhead, and trout populations:

1. ***Suction dredge mining disturbs cover habitat for salmon and trout.*** By removing and/or displacing cobbles, boulders, and logs, suction dredge mining impacts important cover habitat for juvenile salmon and trout[1]. Cover habitat is essential for juvenile salmon and trout as it enables them to avoid predators and to avoid displacement during winter floods[2]. The amount and quality of cover habitat in streams is known to be a factor limiting the productivity of many of Oregon's salmon and trout populations[3].
2. ***Suction dredge mining reduces the reproductive success of Pacific salmon.*** Suction dredge mining destabilizes the streambed gravels that salmon use for spawning [4]. Spawning gravel that has been disturbed by suction dredge mining is known to erode at a higher rate than in undisturbed areas, thereby increasing the mortality of incubating salmon eggs[4]. These effects can occur well after suction dredge mining activity has ceased.
3. ***Suction dredge mining results in direct mortality to incubating eggs and juvenile fish.*** Eggs and juvenile fish suffer high mortality when entrained by suction dredges[1, 5]. This is particularly important for species like cutthroat trout and steelhead that spawn in late winter

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and whose eggs may incubate into summer[1]. It is also important for bull trout, a federally listed species that spawns in very cold streams and whose eggs and larvae remain in the streambed well into summer.

4. ***Suction dredge mining increases sedimentation in downstream habitats.*** Suction dredge mining can result in levels of fine sediments (silts and sands) in downstream habitats that are as high as 10 to 20 times above background conditions[1, 5, 6]. Fine sediments impact fish habitat by filling in the crevices between boulders and cobbles that otherwise provide cover for juvenile salmon and trout, and by smothering spawning gravels with sands and silts that prevent adequate oxygen from reaching incubating eggs. Fine sediments can also decrease the abundance of aquatic insects, a major prey source for juvenile fish. Studies have documented a reduction in aquatic insect communities in areas affected by suction dredge mining in comparison to those areas not affected by mining[7].

In summary, the scientific literature has identified a number of impacts to salmon, trout and their habitats from suction dredge mining. The impacts occur across a variety of life stages, ranging from direct and indirect mortality during egg and larvae incubation, to impacts to the food resources and cover habitats that are essential for juvenile salmon and trout.

Finally, I wish to discuss the potential negative effects of suction dredge mining within the context of salmon and steelhead recovery in the State of Oregon. Wild Salmon Center works to protect Oregon's most intact salmon watersheds before they are degraded and their salmon and steelhead populations are in decline. It is easier and cheaper to conserve a salmon river while it's still healthy than to try to fix that river once it's broken. We invest our energy in individual stronghold rivers that serve as anchors to recover diminished salmon runs throughout the state. Stronghold rivers are identified through a collaborative, science-based process that locates watersheds currently supporting exceptional salmon and steelhead abundance and diversity. The Illinois, North Fork John Day, and Wenaha are examples of stronghold rivers that have been identified in partnership with the State of Oregon[8]. Based on impacts documented in the scientific literature, we believe that suction dredge mining poses a threat to the State's salmon strongholds. We believe that the likely impacts of suction dredge mining on salmon strongholds may make conservation and recovery of the State's salmon resources more difficult and more costly. As you address the challenge of balancing the health of the State's salmon resources with other interests, we ask that you consider the documented negative effects of suction dredge mining during your decision-making.

Thank you for the opportunity to provide testimony on this important issue. I would be happy to follow up with you in person to address any questions you have about my testimony.

On behalf of the Wild Salmon Center, respectfully,

Matthew R. Sloat

Matthew R. Sloat, Director of Science, Wild Salmon Center

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End Notes:

1. Harvey, B. C., and T. E. Lisle. 1998. Effects of suction dredging on streams: a review and an evaluation strategy. Fisheries 23(8):8-17.
2. Bustard, D.R. and Narver, D.W., 1975. Aspects of the winter ecology of juvenile coho salmon (Oncorhynchus kisutch) and steelhead trout (Salmo gairdneri). *Journal of the Fisheries Board of Canada*, *32*(5), pp.667-680.
3. Solazzi, M. F., Nickelson, T. E., Johnson, S. L., & Rodgers, J. D. (2000). Effects of increasing winter rearing habitat on abundance of salmonids in two coastal Oregon streams. *Canadian Journal of Fisheries and Aquatic Sciences*, *57*(5), 906-914.
4. Harvey, B. C., and T. E. Lisle. 1999. Scour of chinook salmon redds on suction dredge tailings. North American Journal of Fisheries Management 19:613-617.
5. Horizon Water and Environment. 2009. California Department of Fish and Game Suction Dredge permitting Program: literature review on the impacts of suction dredge mining in California. Report prepared for the Department of Fish and Game, Redding.
6. Somer, W.L. and Hassler, T.J., 1992. Effects of suction-dredge gold mining on benthic invertebrates in a northern California stream. *North American Journal of Fisheries Management*, *12*(1), pp.244-252.
7. Harvey, B.C., 1986. Effects of suction gold dredging on fish and invertebrates in two California streams. North American Journal of Fisheries Management, 6(3), pp.401-409.
8. Information about the North American Stronghold Partnership can be found here: https://www.wildsalmoncenter.org/work/science/stronghold-approach/

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