PACIFIC COAST FEDERATION of FISHERMEN'S ASSOCIATIONS

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STATEMENT BY NW REGIONAL DIRECTOR GLEN SPAIN ON BEHALF OF THE PACIFIC COAST FEDERATION OF FISHERMEN'S ASSOCIATIONS (PCFFA)

TO THE

OREGON SENATE COMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

(Support for SB 3 – Regulation of Motorized Instream Mining) Hearing on 6 February 2017

The Pacific Coast Federation of Fishermen's Associations (PCFFA) is the West Coast's largest commercial fishing industry trade association, representing the interests of family-owned, commercial seafood harvest operations coastwide. We are organized as a federation of 15 different coastal fishing port associations, vessel owners' associations and port-based seafood marketing associations. The collective membership of all these PCFFA-affiliated member groups is about 1,000 commercial fishing family businesses working in every U.S. West Coast port, and in every commercial fishery. Our members' collective net business investment in those fisheries is well over $200 million, employing thousands of people.

PCFFA Testimony
Re: OR SB 3 – Support
6 February 2017

We want to go on record as supporting the compromise bill of SB 3 (Courtney) being debated in this Committee today, as the preferred pathway to resolving the long-festering issues related to in-river motorized mining (particularly what is called "suction dredge mining") in the State of Oregon.

Although it is clearly a compromise, *and certainly not as strong on certain suction dredge protections as we might have liked*, it does nevertheless provide several valuable protections for instream aquatic life that we sought both in the previous Legislature and through the Governor's SB 838 Stakeholder Task Force, on which PCFFA was represented. For instance, it still allows suction dredge and other forms of in-stream mining to proceed in those many areas in which there are no over-riding state interests for the protections of public trust assets, including valuable salmon runs which our people harvest for their livelihoods.

The majority of our West Coast commercial fishing industry fleet still participates in its once abundant ocean commercial salmon fisheries. These salmon runs, in turn, depend upon maintaining healthy and biologically productive river systems for their existence. Salmon hatch from eggs laid in freshwater streams, and are thus *at their most vulnerable life stage* within Oregon's small inland streams. Unfortunately, those are in many cases precisely the same streams most heavily targeted in Oregon by suction dredge miners.

In recent years – due in large part to the ongoing suction dredge moratorium in California, but also to the recent high price of gold – until the recent SB 838-required moratorium, there have been nearly twice as many suction dredge miners working in Oregon (about 1,700) than typically occurred in the past. These suctions dredge operations were also highly concentrated in coastal salmon-bearing streams. This means proportionally greater impacts on fragile coastal streams which are the nursery beds for the very salmon that our industry depends upon for its livelihoods. Many of those salmon runs are also protected by other state and federal laws, while at the same time being jeopardized by suction dredging!

Anything that jeopardizes the regions' valuable salmon runs, or decreases salmon survival rates generally within their native rivers, *ultimately costs our industry jobs and dollars* by depleting our allowable harvest. Suction dredging is clearly one of those negative impacts.

Adverse Impacts of Suction Dredging Are Well-Documented and Can Cumulatively Be Extensive

It is an article of faith among suction dredgers that their operations, as they often repeat: "do not harm fish in any way." Frankly, this myth is a fabrication intended to support widespread denial. It has no scientific support.

Suction dredge operations can and do interfere with, and in some cases destroy, salmon egg nests ("redds"). Suction dredges can disrupt river ecosystems in multiple way, as noted in a report to the 2013 Oregon Legislature by the Oregon Chapter of the American Fisheries Society, Effects of Suction Dredge Mining on Oregon Fishes and Aquatic Habitats (April, 2013). That Report was updated in March, 2015 for Legislative Hearings on the prior version of what is now SB 3. For brevity and for the record in these new hearings, that 2015 Supplement Report – which includes references to extensive studies and scientific bibliographies documenting those multiple and extensive adverse impacts – is attached.

Of particular concern is the fact that suction dredges frequently exhume elemental mercury now safely trapped under many feet of clay-based river sediments, and which is then released back into the environment in the form of small droplets where it can easily oxidize to become methylmercury, a potent (and cumulative) neurotoxin that affects both fish as well as human health.

Even if a large portion of this elemental mercury is then collected by the operator (as many claim), such collections are *never 100% efficient*. The remainder is then dispersed back into the river where it is once again exposed to chemical processes that can "methylate" mercury to convert it into the most toxic family of mercury compounds known. These methylmercury compounds are water

soluble, enter urban water systems, bio-accumulate in fish that are part of the human food chain, and are deadly human neurotoxins. Unborn and small children are at particular risk of neurological damage from *even very small amounts* of these virulent mercury-based toxins.

While one dredge operation may have small individual impacts on aquatic life, of particular concern is the cumulative impact of the heavy concentration of multiple suction dredge operations in fragile coastal salmon spawning areas that we have been repeatedly seeing. Many of those regions also contain mercury and other toxic metal compounds currently entombed in the clay sediment bottoms of rivers, which are then disturbed and redistributed by the dredgers. These negative impacts are both cumulative as well as synergistic.

Fragile Coastal Watersheds Should be Off Limits

Many of Oregon's once-abundant salmon runs are now just beginning to recover from near extinction due to widespread instream habitat losses. Several of these coastal salmon runs (such as the Oregon coastal coho) are now federally listed as either endangered or threatened species under the Federal Endangered Species Act (ESA).

Tens of millions of dollars in taxpayer and landowner money and years of effort has already gone into repairing Oregon's many damaged coastal salmon watersheds, through such programs as the Oregon Plan for Salmon and Watersheds and through the Oregon Watershed Enhancement Board (OWEB).

It makes no policy sense, and worse economics, for the State of Oregon to allow widespread and highly invasive suction dredge operations in coastal rivers that are simultaneously being rehabilitated at great public and private expense. At best, this amounts to the government working at cross-purposes with itself, essentially undoing the work it has already done toward river restoration. Worse, under prior

laws and regulations the Oregon suction dredge permit program was running at a *total net loss to the State*, and could not pay even a substantial fraction of the law enforcement costs of the program.

In other words, under prior laws and regulations, the destruction of Oregon's key salmon streams caused by suction dredge mining was actually being *heavily subsidized* by the very same Oregon taxpayers who were also paying to clean up the damages that such suction dredge operations cause!

LEGISLATIVE SOLUTIONS PRESENTED BY SB 3

Under SB 3, suction dredge mining would not be allowed in habitat that is important for native salmonids, lamprey and bull trout, nor in streams already too polluted by turbidity, sediments or toxic metals like mercury. This is only common sense! Tribes will also be able to protect their cultural resources under this bill. The Agencies are given some time to develop new rules and regulations in order to begin implementing these new standards by 2021. Furthermore, suction dredges would be subject to reasonable inspection (just as most other boats already are) to prevent the accidental transport of aquatic invasive species from one stream to another or across state lines. And the cost of the program would be reset so that it does not burden Oregon taxpayers, but rather pays for its own enforcement and implementation costs, as also makes good policy and economic sense.

To that end, PCFFA supports efforts by the Legislature which would help remedy and prevent some of those past resource use conflicts between suction dredge miners and the fishing industry, and which would limit the adverse impacts of suction dredging generally on our salmon runs, our salmon-dependent coastal communities, and the state's economically important fishing industry jobs.

Specifically, PCFFA supports SB 3 as a compromise solution to most of these problems.

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ATTACHMENT: Report to the 2015 Oregon Legislature by the Oregon Chapter of the American Fisheries Society, *Effects of Suction Dredge Mining on Oregon Fishes and Aquatic Habitats, Supplemental Information* (March, 2015).

American Fisheries Society

Oregon Chapter

OR Chapter AFS: PO Box 8062 Portland, OR 97207-8062

www.orafs.org

March 23, 2015

Dear Honorable Legislator:

The Oregon Chapter of the American Fisheries Society (ORAFS) is comprised of over 500 fisheries and aquatic science professionals from federal, state, and tribal agencies, colleges and universities, diverse private employers, college students, and retirees. The Chapter was established in 1964 as part of the American Fisheries Society. Our mission is to improve the conservation and sustainability of Oregon fishery resources and their aquatic ecosystems for long-term public benefit by advancing science, education and public discourse concerning fisheries and aquatic science and by promoting the development of fisheries professionals.

During Oregon's 2013 legislative session, our organization introduced a white paper on the effects of suction dredge mining on Oregon fishes and aquatic habitats (attachment). We have recently completed a supplemental paper on mercury, geomorphology and fish/bivalve species impacts (attachment) as a companion document. As you address the challenging task of balancing the health of these resources with other interests, we ask that you consider both the original and this supplemental white paper in which we review the literature that examines the potential impacts of suction dredge mining on fisheries and aquatic resources. Both the original white paper and this supplement are the product of considerable thought, effort, scientific insight and process among members of the ORAFS.

Based on our review of the literature, we find 1) there are potentially negative effects of suction dredge mining on stream morphology and spawning/reproductive success of some fish and freshwater bivalves (freshwater mollusks), 2) mercury impacts can be increased by dredging and particularly may affect juvenile rearing salmonids in their critical habitats, and 3) without a significant investment in monitoring and enforcement of suction dredge mining permits, best management practices and mitigation efforts are likely to be inconsistently implemented potentially harming aquatic resources.

We hope that the information provided by the ORAFS will help to inform your decisions as you consider suction dredge mining legislation. Thank you for the opportunity to provide this information.

Sincerely,

Michael Gauvin- President, American Fisheries Society-Oregon Chapter

503-947-6214, president@orafs.org

Attachments:
Effects of suction dredge mining on Oregon fishes and aquatic habitats, Supplemental Information- ORAFS March 2015
Effects of suction dredge mining on Oregon fishes and aquatic habitats- ORAFS April 2013

EFFECTS OF SUCTION DREDGE MINING ON OREGON FISHES AND AQUATIC HABITATS, SUPPLEMENTAL INFORMATION

OREGON CHAPTER AMERICAN FISHERIES SOCIETY
MARCH 2015

SUMMARY

Oregon Chapter of the American Fisheries Society (ORAFS) previously authored a 2013 white paper entitled, "Effects of Suction Dredge Mining on Oregon Fishes and Aquatic Habitats" that is available at www.orafs.org. In 2014, in accordance with Senate Bill 838 (passed in 2013), the Governor convened a study group to develop recommendations for a regulatory framework for suction dredge mining in Oregon. In addition to restricting suction dredge mining, SB 838 calls for a five year moratorium on suction dredge mining beginning in January 2016 unless a new regulatory framework is approved. Our intent in providing this supplemental information is to inform policy conversations that have the potential to lead to additional regulations.

This supplemental white paper reinforces the previous white paper's recommendations and provides additional details from our literature review and professional knowledge about specific effects from suction dredge mining as it relates to mercury, geomorphology, lamprey, and impacts to freshwater mussels and clams (bivalves). Our work on the original white paper and this supplemental paper has led us to make the following overall recommendations:

1. Review and strengthen current best management practices (BMP) (e.g. Oregon DEQ 2010 and Oregon DSL 2011) to substantially reduce or eliminate impacts to lamprey and other fish species, bivalves and aquatic habitat. BMP elements for consideration may include:
    - Monitor tailings from dredging operations to ensure they are not used by fish and bivalves for spawning or during other sensitive life history stages.
    - Update permitted in-stream work periods to protect all seasonal fish species spawn timings and enforce them to adequately protect egg and larval stages of fish and bivalves.
    - Inventory fish species presence in streams currently open to suction dredge mining. Mapping and monitoring locations of lamprey and bivalve presence for inclusion in areas to be avoided by suction dredge mining operations.

2. Prohibit suction dredge mining in areas used for spawning by sensitive fish stocks, particularly in areas of Essential Salmonid Habitat (ESH). These areas would be determined by biologists who would review dredge permits before they are issued.

3. Adequately enforce stipulations in suction dredge mining permits (e.g., removing mercury, leaving boulders and instream large wood in place, fueling away from streams, leaving riparian vegetation intact, etc.), particularly in ESH areas.

4. Reduce the uncertainty of impacts resulting from increased suction dredge mining activity in Oregon waters through monitoring and reporting of activities. Specifically, we recommend including:
    - A risk assessment of Oregon watersheds where suction dredge mining has the potential to mobilize toxic heavy metals already present or deposited by historical mining actions.
    - Annual reporting of stream area/volume disturbed by suction dredge mining in both ESH and non-ESH areas.
    - Developing methodologies for predicting biological impacts from multiple suction dredge mining operations in a single system.
    - Independent monitoring of a random sample of suction dredge mining claims throughout Oregon to evaluate localized impacts to fish and aquatic habitat.
    - Studying efficacy of smoothing suction dredge tailings as an effective mitigation technique for suction dredge mining in areas of spawning fishes.

MERCURY ACCUMULATION IN HABITAT AND IN FISHES

Legacy mercury occurs in many deep streambed sediments as a result of historical gold mining practices in Oregon. Mercury (Hg) and trace metals are remobilized from stream bed sediments during suction dredge mining and high banking practices (USFS 2015). The methylated form of mercury (MeHg) has the greatest potential to negatively impact fish and other aquatic or terrestrial species that eat fish (piscivorous). Methylmercury is passed up the food chain through adsorption by plankton and then by bio-accumulating in the tissues of organisms in higher concentrations at each successive trophic level. Fish metabolic processes are not effective at processing and eliminating methylmercury and at certain tissue concentrations, methylmercury negatively impacts behavior, health and reproductive success (USFS 2015). Bloom (1992) as cited by USEPA (1997) demonstrated that over 95 percent of mercury in fish tissue is in the methylated form and fish obtain greater than 90 percent of the methylmercury in their tissue from food (Sandheinrich and Wiener (2011)).

Rearing juvenile salmonids may be particularly vulnerable to increased methylmercury production as a result of suction dredge mining. Juvenile salmonids are known to utilize habitats such as lakes, sloughs, side channels, estuaries, beaver ponds, low-gradient tributaries to large rivers, and large areas of slack water. Marvin-DiPasquale et al. (2011) suggests that mercury contaminated fine sediments in the clay-silt sediment fraction may travel in the water column far downstream from source locations and settle in slow velocity areas. Such slow velocity areas include wetlands that also provide substrates rich in organic materials that are conducive to methylmercury production. Therefore, suction dredge mining related increases in methylmercury are most likely to be observed in wetlands and estuarine environments that are also known to be important rearing habitats for juvenile salmonids.

To summarize, piscivorous fish in the Rogue River basin already exhibit mercury tissue concentration levels that are known to cause deleterious effects to fish. Increased suction dredge mining will further increase the availability of methylated mercury to bioaccumulate in fish, and juvenile rearing salmonids may be particularly vulnerable because the habitats they utilize are conducive to methylated mercury production. It is likely that there are also negative impacts from mercury contamination to other non-salmonid fishes in the Rogue River, particularly those that are long-lived.

RISKS TO GEOMORPHOLOGY FROM SUCTION DREDGE MINING

Suction dredge mining is disproportionately concentrated in southwest Oregon. About 70 percent of the 748 ODEQ authorizations issued for suction dredge mining in 2014 were in two basins: the Rogue River (48 percent) and Umpqua River (22 percent). The sub-basins with the greatest numbers of authorizations were the Middle Rogue with 179 and the South Umpqua with 156 (E. Brawner, ODEQ, Pers. Comm. 2014 as cited in USFS 2015).

Harvey and Lisle (1998) describe that dredging activities near riffle crests can destabilize spawning areas and adjacent downstream stream reaches and suction dredge activities have the potential to decrease the depth of upstream pools by degrading riffle crests which control upstream water surface elevations (i.e., hydraulic control). Published studies document that effects of dredge tailing piles to channel morphology and bed composition are not long-lasting and are typically not visible the next year as a result of peak flows after the dredging season. However, Harvey et al. (1982), Thomas (1985) and Stern (1988) describe exceptions for sites not near the thalweg and where cobbles and boulders had been piled. Additionally, Thomas (1985) identified that gravel from dredging tailing piles can redistribute downstream from the original location and fill downstream pool habitat within a year. This relates back to how with the removal of substrate and disturbance of the stream bed, spawning areas, rearing, and holding areas are negatively impacted by dredging activities. These disturbances may impact the life history and biology of anadromous and resident fish, and change natural stream function in both short term and long term timeframes.

Dredging impacts also increase as dredging locations expand from single to multiple sites. The accumulation of impacts associated with dredging activities within a stream may result in cumulative effects that are greater than effects associated with a single suction dredge location. A difficulty in addressing this cumulative effects question is that the impact dredging footprint at an individual claim can vary dramatically. Typically a dredger burrows to bedrock and many holes are 3 feet deep, which along with the related tailings pile(s), can affect a large part of the active streambed, particularly in smaller streams. Streambed modifications can significantly modify the amount and quality of spawning and rearing habitat available. Additionally, modification and deposition of fine sediment may affect adjacent and downstream habitats. The length of stream impacted by suspended sediment can vary widely depending on the type of channel bed material at the dredging location. If channel bed material is coarse with few fines, sediment related impacts will be more localized as

heavier mobilized sediments settle a short distance from the dredging site. Finer sediments including clay, silt, and sand remain suspended in the water column over long distances and have the potential to impact habitats at considerable distance from the mining site.

Concentrated dredging in specific stream reaches may have cumulative impacts to geomorphology including:

- Armoring of river bottoms from downstream redistribution of stream bed materials and fine sediment re-suspension and redistribution, including frequent and long-lasting unseasonal turbidity plumes. Increased fine sediments can negatively affect early life stage fish by decreasing circulation of oxygenated water through interstitial spaces in gravel, therefore decreasing egg to fry survival.
- Destabilization of stream bed spawning habitat and reduction in adjacent pool depths affects habitat quality, and in turn, is detrimental to spawning, holding, and rearing habitat availability and fish use. Habitat destruction causes the redistribution of juvenile and adult fish to less suitable habitats.
- Seasonal, short-term or long-term changes in stream bed sediment size, composition, and stability which can reduce macroinvertebrate fauna and stream productivity.

POTENTIAL IMPACTS TO LAMPREY AND FRESHWATER BIVALVES

Suction dredge mining has the potential to affect native freshwater bivalves and non-salmonid Oregon State Sensitive species including lamprey. Both lamprey and freshwater bivalves live for a portion of their life cycle in the stream bed and banks. Lamprey spawn in the spring and early summer (Moser et al. 2007, Luzier et al. 2011) in gravel at pool tailouts and riffles, creating nests for embryos. Juvenile (ammocoetes) rearing habitat is typically nearby associated spawning habitat (Moser et al. 2007). Lamprey embryos typically remain in the substrate for 19 days after spawning depending on water temperature. After hatching, ammocoetes burrow into the stream sediment and filter feed for between 2 and 7 years (USFWS 2012).

Freshwater bivalves spend their lives buried in sediment and as they mature the posterior end of the bivalve projects above the sediment surface during warm months, and retreats beneath the surface during colder months. Male bivalves will release gametes into the water column which are then drawn in by females to achieve internal fertilization of their eggs. Females then release larva (glochidia) into the water column, where they attach to fish and stay for days to months. The glochidia later release from the fish and burrow into the sediment. Release of glochidia varies by species and is triggered by environmental conditions and presence of host fish species (Nedeau et al. 2008).

Lamprey (embryos and ammocoetes) and bivalves (adults and glochidia) can be present in the stream bed during all times of the year. These species are at risk of direct mortality by being passed directly through a dredge, nesting destruction, and displacement and degradation of rearing habitats (HWE 2009). Overall impacts of suction dredge mining to rearing lamprey include direct mortality from being passed through a dredge, and indirect effects such as habitat disturbance which could lead to displacement and an increased chance of predation as well altered food availability. Since various lamprey life stages are present in the system for up to 7 years, continued disruption at the same habitat could have long lasting effects over time to generations of fish. Suction dredge mining is considered a threat to lamprey (USFWS 2012) and there is a need to develop guidance on suction dredge operations to protect ammocoetes (Luzier et al. 2011).

LITERATURE CITED

Bloom, N. 1992. On the chemical form of mercury in edible fish and marine invertebrate tissue. Canadian Journal of Fisheries and Aquatic Sciences: 49:1010-1017.

Brawner, E. 2014. Oregon Department of Environmental Quality [ODEQ], Suction Dredge Mining Specialist. Personal communication with Susan Maiyo, Forest Fishery Biologist, Rogue River National Forest.

Harvey, B., K. McCleneghan, J. Linn, and C. Langley. 1982. Some physical and biological effects of suction dredge mining. California Department of Fish and Game Environmental Services Branch Fish and Wildlife Water Pollution Control Laboratory. Laboratory Report No. 82-3. Rancho Cordova, California.

Horizon Water and Environment [HWE]. 2009. Suction Dredge Permitting Program. Literature review on the impacts of suction dredge mining in California. http://www.dfg.ca.gov/suctiondredge/

Luzier, C.W., H.A. Schaller, J.K. Brostrom, C. Cook-Tabor, D.H. Goodman, R.D. Nelle, K. Ostrand and B. Streif. 2011. Pacific lamprey (*Entosphenus tridentatus*) Assessment and Template for Conservation measures. U. S. Fish and Wildlife Service, Portland, OR. 282 pp.

Marvin-DiPasquale, M., J.L. Agee, E. Kakouros, L.H. Kieu, J.A. Fleck, and C.N. Alpers. 2011. The effects of sediment and mercury mobilization in the South Yuba River and Humbug Creek confluence area, Nevada County, California: Concentrations, speciation and environmental fate—Part 2: Laboratory Experiments: U.S. Geological Survey Open-File Report 2010−1325B, 53 p.

Moser, M.L., J.M. Butzerin and D.B. Dey. 2007. Capture and Collection of lampreys: the state of the science. Reviews in Fish Biology and Fisheries 17(1):45-56.

Nedeau, E.J., A.K. Smith, J. Stone and S. Jepsen. 2009. Freshwater Mussels of the Pacific Northwest, second edition. The Xerces Society for Invertebrate Conservation.

Oregon Department of Environmental Quality [DEQ]. 2010. 700 PM permit. http://www.deq.state.or.us/wq/wqpermit/mining.htm

Oregon Department of State Lands [DSL]. 2011. http://www.oregon.gov/DSL/PERMITS/docs/placer_facts.pdf

Sandheinrich M. and J. Wiener. 2011. Methylmercury in freshwater fish: recent advances in assessing toxicity of environmentally relevant exposures. In: Beyer WN, Meador JP (eds) Environmental contaminants in biota: interpreting tissue concentrations, 2nd ed. Chapter 4:169-190.

Stern, G. 1988. Effects of suction dredge mining on anadromous salmonid habitat in Canyon Creek, Trinity County, California. A thesis presented to the faculty of Humboldt State University in partial fulfillment of the requirements for the Degree of Master of Science. 80 p.

Thomas, V. 1985. Experimentally determined impacts of a small, suction gold dredge on a Montana stream. North American Journal of Fisheries Management: 5:480-488.

United States Fish and Wildlife Service [USFWS]. 2012. Pacific Lamprey Fact Sheet.

United States Forest Service, Rogue River-Siskiyou National Forest (USFS). 2015. Suction Dredging and High Banking Operations for Notices of Intent within the Rogue River-Siskiyou National Forest. Biological Assessment.

United States Environmental Protection Agency [US EPA]. 1997. Mercury study report to Congress. Volume III: Fate and transport of mercury in the environment. EPA-452/R-97-005. December 1997.