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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**

**(Suction Dredging Limits)**

**April 16, 2013**

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 \$100 million, employing thousands of people.

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 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 – there have been nearly twice as many suction dredge miners working in Oregon (about 1,700) than typically occurred in the past. This means proportionally greater impacts on fragile coastal streams.

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 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 is a fabrication intended to support widespread denial.

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 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). For brevity and for the record in these new hearings, that 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 are then released back into the environment in the form of small droplets. Even if a large portion of this elemental mercury is then collected by the operator as many claim, such collections are never 100%. 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 recently seeing. *These negative impacts are both cumulative as well as synergistic.*

## **The Most Fragile Coastal Watersheds Should be Off Limits**

Many of Oregon's once-abundant salmon runs are now just beginning to recover from near-extinction. 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 that river restoration.

### **Oregon's Suction Dredge Program Is Heavily Publicly Subsidized**

At present, the Oregon suction dredge permit program is almost certainly running at a net loss to the State -- or would be, if in fact it paid for any systematic program of monitoring or enforcement. To give some examples of the true costs of such programs, looking to the California suction dredge permitting program prior to the current moratorium, the whole California program, according to records from the California Department of Fish & Wildlife, cost the state approximately \$1.8 million. However, the permit application fees collected from some 3,000 permittees generated only about \$300,000 annually. In other words, the true costs of this comparable California program (i.e., including monitoring and enforcement) was really about  $\$1.8 \text{ million} \div 3,000 \text{ permits} = \text{or about } \$600/\text{permit}$ . *This meant that the program was being subsidized by the State of California taxpayers by about \$1.5 million/year.* This lack of fiscal solvency was one major reason the California Legislature imposed the current moratorium, and a Legislative precondition for resumption of the California program is that any future program must at least pay for its own costs, including monitoring and enforcement. This should be a condition imposed in any Oregon program as well.

Assuming the same costs for a comparable Oregon program (i.e., about \$600/permit) x approximately 1,700 current permits, an appropriate level of program costs that would have to be incurred by the State of Oregon would be  $\$600/\text{permit} \times 1,700 \text{ permits} = \text{about } \$1.02 \text{ million}$ . Yet at the current statutory permit fee prices of only \$25/year or \$100/5-year renewal, this Oregon program only generates roughly (i.e.,  $\$25/\text{year-permit} \times 1700 \text{ permits}$ ) \$42,500/year, or approximately \$50,000 including the one-time \$300 application fee -- *and is therefore similarly*

*insolvent.*<sup>1</sup> **In other words, this program, which damages Oregon’s watersheds and its other river-dependent industries, is also heavily taxpayer subsidized.** In a time when schools are being defunded, many government services are being terminated and the state cannot even maintain an adequate police force, this makes no economic or policy sense at all.

## LEGISLATIVE RECOMMENDATIONS

- (1) It makes *no economic or policy sense whatsoever* to continue to allow suction dredge operations in Oregon’s most sensitive and most valuable waterways, nor in ways that undermine Oregon’s other investments in stream habitat restoration. There is nothing radical or unique about such legislative exclusions. For instance, stream segments that are already designated as “scenic waterways” are already excluded from suction dredge permits. However, those designated scenic waterways today only include about 1/3<sup>rd</sup> of 1% of Oregon’s total streams. Additional stream segments that should be permanently withdrawn (i.e., excluded) from the suction dredge program entirely include those:
- (a) in which there are known mercury or other toxic heavy metal contaminations, or in which there are likely to be such contaminants due to geology or past mining history;
  - (b) in designated critical habitat for federal or state ESA-listed endangered or threatened aquatic species, or in which there are state listed “sensitive species” or “species of concern”;
  - (c) stream segments designated as “essential salmonid habitat” or which are known habitat for key aquatic food species such as lamprey, bull trout and mollusks which supply the food chains of many other aquatic and stream dependent terrestrial species;
  - (d) in stream segments already Clean Water Act 303(d) listed as “water quality limited” for sediment, temperature, toxic metals or other water quality conditions that could be exacerbated by suction dredge operations;
  - (e) in stream segments up to 5 miles hydrologically upstream of any public or private domestic water supply intake system.
- (2) The fee scale for the program should be structured so as to pay for itself, including its own ongoing and active monitoring and enforcement programs. Adequate monitoring and enforcement against illegal uses are essential to best management practices being fully implemented.

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<sup>1</sup> These are rough estimates only for purposes of illustration. More precise cost numbers should be obtained from the agency itself. It should also be noted that an annual renewal fee of \$25/year can be kept so small only because the agency has nearly zero enforcement or monitoring in association with the current program.

(3) When these issues last came before the Legislature, we generally endorsed and supported the other recommendations made by the Oregon AFS in its April 2013 Report to the Legislature as attached. We still support those recommendations.

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.

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PCFFA-StatementORSuctionDredge(04-16-15)

**Oregon Chapter  
American Fisheries  
Society**

**P.O. Box 8062  
Portland, OR 97207-8062**



April 3, 2013

Dear Honorable Legislator:

Aquatic and fishery resource issues are again prominent topics this legislative session with suction dredge mining issues taking a front seat. As you address the challenging task of balancing the health of these resources with other interests, we ask that you consider this white paper in which we review the literature that examines the potential impacts of suction dredge mining on fisheries and aquatic resources. The attached white paper is the product of considerable thought, effort, scientific insight and process among members of the Oregon Chapter of the American Fisheries Society (ORAFS).

Based on our review of the literature, we find 1) some current suction dredge mining mitigation efforts may be adequate, *if properly monitored and enforced*, to prevent many (but not all) substantial adverse effects to fish and their habitats, 2) potentially negative effects of suction dredge mining on stream morphology and spawning/reproductive success of some fishes (and bivalves), 3) current best management practices (BMPs) for suction dredge mining can be strengthened to further reduce risks, and 4) without a significant investment in permit monitoring and law enforcement of suction dredge mining permits, BMPs are likely to be inconsistently implemented or ineffective potentially harming fishes (and other aquatic species) and their habitats. Finally, we offer suggestions for minimizing potential negative effects on fishes and their habitats from suction dredge mining.

The ORAFS is comprised of over 450 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.

Thank you for considering this ORAFS white paper as you craft and deliberate various pieces of suction dredge mining legislation that have the potential to affect the health of our State's important aquatic resources. Please let us know if you have any questions.

Sincerely,

Jeffrey Yanke  
President, American Fisheries Society - Oregon Chapter  
541.426.3279, [president@orafs.org](mailto:president@orafs.org)

Attachments: 2013 ORAFS Suction Dredge Mining Impacts Final.pdf

## EFFECTS OF SUCTION DREDGE MINING ON OREGON FISHES AND AQUATIC HABITATS

Oregon Chapter American Fisheries Society

April 2013

### SUMMARY

The number of permit applications for suction dredge mining in Oregon has substantially increased due to shifting economic markets. Existing literature suggests that suction dredge mining, when properly managed and regulated, has localized and short-term impacts to fish and aquatic habitat. Maintaining these relatively low impacts, however, requires best management practices (BMP's) are followed and properly enforced. The literature shows that without enforceable BMP's in place, suction dredge mining can adversely alter physical habitats, food webs, behaviors, and physiology of sensitive fishes and other aquatic species (HWE 2011). In addition, continued disturbance of river substrates can mobilize toxic heavy metals, affecting not only aquatic food webs but humans as well (OAFS 2011). Little is understood regarding the impacts of increased and cumulative actions in Oregon streams. Most studies have focused on salmonid stocks of fish, overlooking impacts to other important non-game species such as lamprey and bivalves. Therefore, we recommend a precautionary approach to suction dredge mining in Oregon's waterways that is based on strengthening and enforcing BMP's. We encourage that suction dredge mining be prohibited or greatly reduced where sensitive fish stocks utilize reaches for spawning or where other sensitive life history stages are present.

### RISKS TO FISH FROM SUCTION DREDGE MINING

To date, the most complete literature review regarding impacts to fish and aquatic habitats from suction dredge mining was completed for the California Department of Fish and Wildlife Subsequent Environmental Impact Review (EIR; HWE 2011). Best management practices required by California suction dredge mining permits are similar to Oregon's, and provide a surrogate to evaluate the potential impacts in Oregon waters. This EIR found the impacts on fish from suction dredge mining in California to be less than significant, *as long as mitigation efforts specified in the permitting process were adhered to* (HWE 2011). By definition, 'less than significant' indicated a measureable impact, but not one likely to result in an adverse population-level effect on a particular species, or a widespread or long-lasting adverse effect on a natural community (HWE 2011).

However; other studies have documented lower survival, particularly at early life stages, for fish populations proximate to suction dredge mining activity. The tailings from suction dredges often form mounds of loose and unconsolidated gravels and cobbles on which some salmonids (particularly coho

salmon, Chinook salmon, or bull trout) may construct redds (USDA Forest Service 2001). Harvey and Lisle (1999) found that when fish deposit eggs on these dredge tailings, eggs and subsequent developing larval fish can be lost as tailings are easily displaced during annual high flow events. Suction dredge mining can also cause direct mortality to eggs and early life stages of fishes (as well as bivalves) that are vulnerable to passing through a dredge.

#### RISKS TO AQUATIC HABITATS FROM SUCTION DREDGE MINING

**Suction dredge mining can result in aquatic habitat alterations that include; substrate disturbance, increased fine sediment deposition, and increased turbidity all of which can have adverse impacts to fishes, bivalves and their habitats.** In an assessment of suction dredge mining practices in the western United States, Harvey and Lisle (1998) reported, “effects of dredging commonly appear to be minor and local, but natural resource professionals should expect effects to vary widely among stream systems and reaches within systems”. The resulting impacts are dependent on both the size and available spawning habitat of a river system (Harvey and Lisle 1999). We would expect impacts to be relatively greater in smaller systems with limited spawning habitat. In addition, impacts from suction dredge mining can be exacerbated in systems with flashy hydrology, which can experience multiple scour events each year. However, even in large streams, suction dredge mining has the potential to destabilize substrates on gravel bars and other habitat features important for native fishes and bivalves.

**The size of the dredge compared with the stream is a good index to assess risks of specific suction dredge mining activities.** In general, risks are highest on smaller streams where a larger proportion of the total streambed is disturbed. In larger rivers where a fraction of the stream bed is disturbed, juvenile and adult fishes may be able to avoid the localized impacts. However, if suction dredge mining occurs in habitats with high value for fish production, regardless of stream size, the impact could be substantial. For example, dredging disturbance is limited to less than 25 cubic yards per claim of wetted stream (a claim can occupy approximately 0.5 to 1.0 stream miles) in Essential Indigenous Salmonid Habitat (ESH). Typically, dredgers excavate 3 feet to reach bedrock, equating to a disturbed area of approximately 225 square feet. While this area could be a relatively small percentage of the overall length of stream used by fish, if the 225 square feet disturbed includes high value spawning gravels the actions could potentially result in lost production.

**Assessing the impacts of suction dredge mining on aquatic habitats should not be limited only to permitted activities** (e.g. Oregon DEQ 2010 and Oregon DSL 2011). Although expressly prohibited in Oregon permits; boulders and large cobbles that are important for cover and streambed stability are



sometimes removed from the streambed by suction dredge mining (Nawa 2002). Excavation of stream banks, also prohibited, has been documented to occur in salmonid spawning habitat in association with suction dredge mining activities (Nawa 2002). Several other prohibited actions have been documented in association with suction dredge mining including; removing in-stream large wood, constructing temporary dams, fuel storage directly adjacent to waterways, and removal of riparian vegetation (Nawa 2002). Together, these prohibited actions increase turbidity and sediment that may be harmful to fish by altering spawning and rearing habitats, or altering behavior. *Therefore, BMP's can only be a viable strategy to managing impacts from suction dredge mining if adequately enforced.*

#### HEAVY METAL TOXICITY AND SUCTION DREDGE MINING

**The disturbance of stream substrates during suction dredge mining activities has the potential to mobilize toxic heavy metals, extending risks beyond the aquatic food web to humans.** Mercury and other heavy metals have been shown to have substantial health risks to wildlife and humans, through the consumption of contaminated fish or shellfish (see ORAFS 2011 for a review). Specifically, mercury is a highly potent neurotoxin that impacts the function and development of the central nervous system in both people and wildlife. When mobilized from substrates, mercury is more easily converted to a form that can move through the food chain and can eventually concentrate in fishes.

High concentrations of mercury can be found in streambed sediments, especially in areas with a history of intensive placer and cinnabar mining (e.g. upper Rogue River, Applegate River, Illinois River, northeastern Oregon, and tributaries to the South Umpqua River). Most mercury is buried at depths not normally disturbed during floods; however, *suction dredge mining can exhume this deeply buried mercury*. If not deposited in the dredge sluice box and removed by miners, this mercury is easily mobilized and made available to the food chain (Marvin-DiPasquale et al. 2011). In addition, despite efforts by dredgers to voluntarily retrieve mercury during the process, a significant amount of mercury can still be mobilized into waterways (Marvin-DiPasquale et al. 2011).

#### CONCLUSIONS AND RECOMMENDATIONS

We conclude that, when BMP's are followed, suction dredge mining can have localized and short-term impacts to fishes, bivalves and aquatic habitats. Even with BMP's, suction dredge mining activities can lower survival of eggs and early life stages of fishes that use tailings as spawning substrates, detrimentally alter substrates and river morphology, and mobilize toxic heavy metals. The level of impact is dependent on the size, productivity, and hydrology of the stream where dredging is permitted. Systems at highest risk are smaller, flashy, streams with limited spawning habitat and those inhabited by ESA-listed and

other sensitive aquatic organisms. Aquatic habitat impacts are largely caused by activities prohibited under current permitting regulations. Thus, enforcement is a critical component to managing the potential impacts of suction dredge mining in Oregon waters.

Therefore, based on the review of the current science the Oregon Chapter of the American Fisheries Society recommends:

- Reviewing and strengthening current best management practices (e.g. Oregon DEQ 2010 and Oregon DSL 2011) to substantially reduce or eliminate impacts to fishes, bivalves and aquatic habitat. Elements of these BMP's for consideration may include:
  - Ensuring dredge tailings are not used by fishes and bivalves for spawning or during other sensitive life history stages.
  - Ensuring that permitted in-stream work periods are adequate to protect egg and larval stages of native fishes and bivalves.
- Prohibiting or greatly reducing suction dredge mining in areas used for spawning by sensitive fish stocks. These areas would be determined by local state and federal fish biologists, who would review dredge permits before they are issued.
- Adequately staffing the enforcement of practices required by 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 areas of Essential Indigenous Salmonid Habitat (ESH).
- Reducing the uncertainty of impacts resulting from increased suction dredge mining activity in Oregon waters through monitoring and reporting of activities. Specifically, we recommend including:
  - An inventory of species presence in streams currently open to suction dredge mining.
  - 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 fall-spawning fishes

## REFERENCES

- Harvey, B.H. and T.E. Lisle 1998. Effects of Suction Dredging on Streams; A Review and an Evaluation Strategy. Fisheries 23 (8) 8-17. Available at <http://www.fs.fed.us/psw/publications/harvey/HarveyLisle.pdf>
- Harvey B.H. and T.E. Lisle 1999. Scour of Chinook Salmon Redds on Suction Dredge Tailings. North American Journal of Fisheries Management 19:613-617. Available at <http://www.fs.fed.us/psw/rsl/projects/water/Harvey99.PDF>
- 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/>
- Horizon Water and Environment [HWE]. 2011. Suction Dredge Permitting Program-Draft Subsequent Environmental Impact Report. (HWE 09.005) Oakland, CA. <http://www.dfg.ca.gov/suctiondredge/>
- Marvin-DiPasquale, M., J. 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
- Nawa, R.K. 2002. Observations of Mining Activities in Siskiyou National Forest Riparian Reserves and Probable Impacts to Aquatic Organisms. Siskiyou Project, 213 SE "H" Street, Grants Pass, OR 97526
- Oregon Chapter American Fisheries Society [OAFS]. 2011. White paper on heavy metals in the aquatic environment. [http://orafs.org/wp-content/uploads/2012/07/2011\\_ORAFS-white-paper-heavy-metals-FINAL-3-29-11.pdf](http://orafs.org/wp-content/uploads/2012/07/2011_ORAFS-white-paper-heavy-metals-FINAL-3-29-11.pdf)
- 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](http://www.oregon.gov/DSL/PERMITS/docs/placer_facts.pdf)
- USDA Forest Service. 2001. Siskiyou National Forest Suction Dredging Monitoring Report Effects of Suction Dredging on the spawning success of Coho Salmon and Steelhead Trout. Siskiyou National Forest.