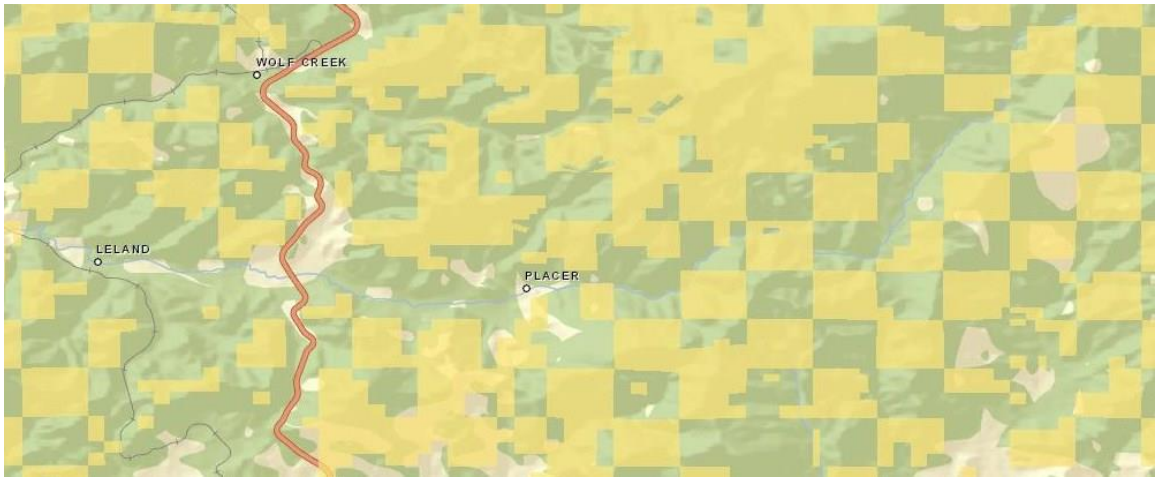
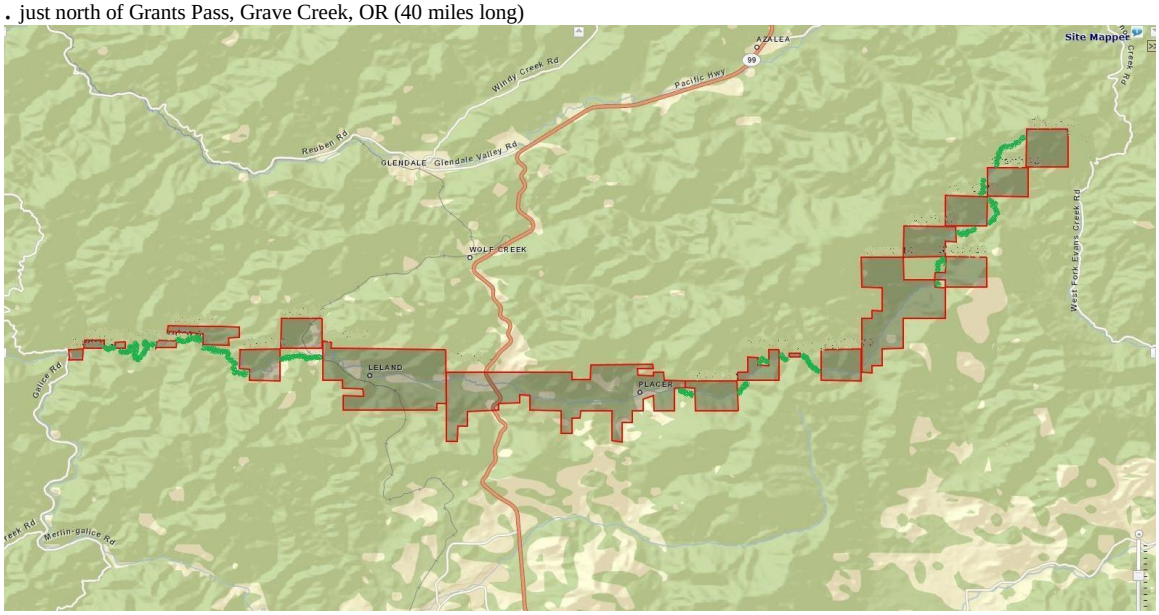
Report on Scale and listings of Relevant Scientific Reports:

On national forest lands the Forest Service requires a plan of operations for mining with significant affects including suction dredging, a POO will involve NEPA requirements with consultations and environmental assessment, it's the same with BLM for anything over a couple of weeks or more than causal prospecting. A large majority of mining claims in Oregon are on BLM managed lands with mining claims on stream segments that would fall within the checkerboard of the O&C lands, there is virtually no mining on farm land and timber company lands. The two figures below represent a typical stream, the first shows the checkerboard BLM lands in yellow, the second figure shows in grey all the areas where there is no mining within the full length (40miles) of Grave Creek, the green is were the stream is mined on 20 acre unpatented mining claims.



. just north of Grants Pass, Grave Creek, OR (40 miles long)



Miners generally target rocky areas on one side of the stream or the other and would be lucky to work a 60 to 100 foot section over the whole season that is set by ODFW.
It's hard to get across how small an impact this really is or how few streams even have gold.

Relevant Science showing miniscule effects:

There have been a number of studies on the effects of small scale gold suction dredge mining that have concluded that these operations have impacts on the environment that are temporary, highly localized, and less-than-significant:

- **1994**, The **Alaska District of the U.S. Army Corps of Engineers** issued Special Public Notice 94-10, which concluded that, the effects from small suction dredges and hand operations were de minimus and did not require Army Corp permitting;

- **2004**, The **Alaska District of the Army Corps** issued Special Public Notice 2004-06, which restated that these placer mining activities still have "de minimus impacts" on the aquatic environment;

- **1994**, In an Environmental Impact Report, the **California Department of Fish and Game**, reached the conclusion that suction dredge mining had a less than significant impact on the environment;

- **2012,** The **California Department of Fish and Wildlife**, under a court order, completed another Environmental Impact Report on small-scale gold suction dredging, at a cost to the state of $1.2 to $1.5 million dollars. The overall conclusion was that the environmental impact from operation of these small scale dredges was less-than-significant for 56 of the 60 factors reviewed

- **2001**, The **Siskiyou National Forest, Oregon** Draft Environmental Impact Report, Suction Dredging Activities are less-than-significant;

- **2004**, The **Clearwater National Forest, Idaho** completed the draft Environmental Impact Statement for Small-Scale Suction Dredging in Lolo Creek and Moose Creek Clearwater and Idaho Counties. The report stated that "EPA generally supports the terms and conditions for dredging and we believe they are designed to protect fish habitat and seem to minimize the potential to damage stream channels and banks.", which supports a less-than-significant outcome;

- **2012**, **Wallowa-Whitman National Forest, Oregon** FINAL Supplemental Environmental Impact Statement reached the conclusion that suction dredge mining had a less than significant impact on the environment; and,

- **2013, U.S. Environmental Protection Agency** Biological Evaluation Small Suction Dredge Placer Mining in Idaho reached the conclusion that suction dredge mining would have a less than significant impact on the environment.

Controversy over the effects of placer mining on the aquatic environment is not new. Indeed, the era of massive hydraulic mining (1880s – 1930's) triggered numerous studies that continue to this day. One of the first studies done on the effects of placer mining in 1938 is important as this study looked at the effects of hydraulic mining on the fisheries of the Rogue River (OR):

Placer Mining on the Rogue River, Oregon, in its Relation to the Fish and Fishing in that Stream. Ward, H.B., 1938. (NOTE: This study was done on the effects of hydraulic mining which were magnitudes higher than the effects from modern day small scale gold **suction dredge** placer mining. (*Hydraulic mining used water canon to blast away mountain sides*).
The essence of Dr. Ward's findings is that the placing of muddy water from placer operations in the Rogue River drainage is not inimical to fish and fish life. The amount of colloidal fines in the Rogue River below placer mines is too small to adversely affect young fish eggs or fish food. Hydraulic **placer mining debris is just more stream sand and gravel. It is typically chemically inert and does not take oxygen from the stream or add toxic agents to the water.** (Emphasis added)
The tank tests at Reed College showed that young fish live well up to thirty days in good water mixed with natural soil materials two to three times as large as the extreme load contributed to the Rogue River by maximum conditions of hydraulic placer mining. The thin intermittent layer of placer mining gritty sediment (less than 1/8 inch) seen along Rogue River would not interfere with oxygen supply to fish eggs.
Stream environments are typically dynamic and variable due to floods, natural inputs of sediment from landslides, and other sources, especially dams. Salmon and steelhead runs were established in past climates much rougher at times than todays, even without mining. That is, in the Ice Age precipitation, landslides and sediment loads were often much greater than today.

There have also been a number of other more recent reports with the same conclusion, starting with:

- Results from the 1992 Chugach National Forest, Alaska Report of Water Quality Cumulative Effects of Placer Mining which stated that, "The results from water quality sampling **do not indicate any strong cumulative effects from multiple placer mining operations** within the sampled drainage" (Huber and Blanchet).

- In 1999 the U.S. Environmental Protection Agency reported the results of a cumulative field study evaluating the performance of 10, 8, and 4 inch gold dredges and concluded environmental impacts from these operations were **less than significant** (Royer et al., 1999).

- Bayley (OSU), 2003, (for Siskiyou N.F., Oregon) Response of fish to cumulative effects of suction dredge and hydraulic mining in the Illinois sub-basin concluded, "The statistical analyses did not indicate that suction dredge mining has no effect on the three responses measured, but rather **any effect that may exist could not be detected at the commonly used Type I error rate of 0.05."**

All of these reports agree that the effect of small-scale gold suction dredging on the environment is **less-than-significant**, **minimal, or immeasurable**.

Net Environmental Benefits of Small-scale Suction Dredging:
These important studies of small-scale suction dredge operations show impacts on the environment have a **less-than-significant** footprint. Furthermore, they make note of beneficial factors that create an overall net benefit to some areas. These factors need to be taken into consideration when interpreting suction dredge activities and further incorporated into best management practices agreements.

Experts agree that fish survival improves under moderate turbid conditions (25 NTU):

- Results of the **Gregory 1993** report notes that any reduction in feeding efficiency of fish may be offset by reduced risk of predation at moderate levels of suspended sediment.

- **CH2M HILL in 2000**, added to that result showing that elevated total suspended solids (TSS) conditions, similar to turbidity plumes created from dredging activity, have been reported to enhance cover conditions, reduce piscivorous fish/bird predation rates, and improve survival.

- **Stern 1988**, stated that, "Pools created by abandoned dredger sites can provide holding and resting areas for juvenile and adult salmonids".

- **Harvey 1991**, studied fish size and habitat depth relationships in headwater streams. During times of low flow in a river or stream, increased water depth can provide a refuge from predation by birds and mammals.

- **Nielsen 1994**, examined excavations from dredging operations finding they can result in temporarily formed pools or deepen existing pools, which may improve fish habitat. Deep scour may intersect subsurface flow creating pockets of cool water during summer, which can provide important habitat for fish

- **2001, Siskiyou National Forest**, found if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures.

- In **1999, the U.S. Environmental Protection Agency** reported the results of a cumulative field study evaluating the performance of 10, 8, and 4-inch gold dredges. The findings showed an increase in macroinvertibrate density and improved diversity in mined areas.

- In **2010, The American River Spawning Gravel Supplemental Environmental Assessment (EA)** points to the benefits of additions of spawning gravels even coming from an outside source. The addition of spawning gravels are to increase and improve Chinook salmon and steelhead spawning and rearing habitat.

- Again in the **2011, American River Spawning Gravel EA**; the supplemental Environmental Assessment Report supported the previous EA reporting benefits of supplementing spawning gravels

Tailings from small-scale suction dredge mining provide excellent spawning gravel. Suction dredging breaks up compacted steam beds; the gravels are dispersed by the high stream flows, making up suitable spawning gravels each year. If insufficient substrate is available Salmonids are left with the choice of spawning over and destroying previously built redds, or using cleaned dredge tailings.

Additional benefits of small-scale suction dredge mining include:
Measureable improvement in water quality due to removal of wastes left by other users of the waters or that have eroded into the waterways. 100's of pounds of lead fishing weights, bullets, water bottles, sunglasses, car debris, nails, broken glass, etc. are removed from our waterways and camping and recreational sites by miners every year.
There is also the very real economic benefit to local areas where such mining occurs and at a statewide and even national level to consider. On average, small-scale and recreational miners in Oregon spend an estimated $20+ million annually on equipment, fuel, maintenance, lodging, etc. while mining, and easily recover another $6-10+ million worth of gold; all-the-while creating and supporting 100's of mining related jobs.
Small scale placer gold mining is also a very important part of the Cultural Heritage of much of Oregon. SW and NE Oregon especially have their roots buried deep in placer gold mining, and thousands of Oregonians have a miner somewhere in their family tree.

There is no evidence that small-scale suction dredge mining has caused any significant harm to the environment. There is ample scientific evidence that demonstrates "convincingly and consistently" that suction dredge mining causes only localized and temporary effects that can produce net beneficial outcomes for the aquatic ecosystem.
(from FINAL-fact-Sheet-060913.pdf Claudia Wise June 9th 2013)

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Lead removed from the Umpqua River 2013, more about dredgers removing lead;
http://outdoorchannel.com/article.aspx?id=16804&articletype=article