CALIFORNIA TRIBAL
BUSINESS ALLIANCE

November 30, 2009

Mr. Mark Stopher
California Department of Fish and Game
Suction Dredge Program Comments
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

I am writing on behalf of the eight member tribes of the California Tribal Business Alliance to submit our comments on the Initial Study for the Subsequent Environmental Impact Report on the Department's Suction Dredge Permitting Program.

The California Tribal Business Alliance was a sponsor of Senate Bill 670 in 2009, and we pushed the budget committees in the Legislature in 2008 to ensure that funding for the SEIR was retained in the state budget.

In particular, we are concerned about the SEIR discussion on Cultural Resources. Potentially significant impacts from suction dredge mining on cultural resources discussed in the initial study are entirely focused on historic objects such as shipwrecks historic structures and archaeological resources.

But mining activities and miners have had a profoundly negative impact on California Indians since the Gold Rush 160 years ago, and they continue to do so into the present time. There is no discussion in the SEIR of the impact of instream suction dredge mining on present-day cultural activities, including traditional ceremonies of Indian people and the use of traditional sites for gathering basketry materials and medicinal plants. Nor is there any discussion of the cultural impact of the loss of salmon runs, which are at the cultural center of some California Indian Tribes.

Indeed, given the history of mining in California, the very presence of miners in the heart of Indian Country is stressful to Indian people, particularly when the miners emulate the historic culture and beliefs of their predecessors. I have enclosed a sampling of comments about Indian people from the suction dredge miners' web pages by way of illustration.

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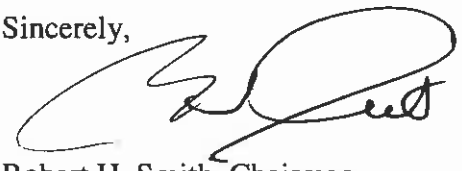
The schedule for the preparation of the SEIR and the adoption of regulations appears to be on a fast track in order to permit the resumption of dredge mining as quickly as possible. We are requesting that the Department put this process on a timeline that allows enough time for a respectful consultation with the Northwest California Indian Tribes and a careful consideration of the issues they raise.

On behalf of our eight member tribes – the Jackson Band of Miwuk Indians, the Lytton Band of Pomo Indians, the Pala Band of Mission Indians, the Paskenta Band of Nomlaki Indians, the Pauma Band of Luiseño Indians, the Picayune Rancheria of the Chukchansi Indians, the United Auburn Indian Community, and the Viejas Band of Kumeyaay Indians – I appreciate this opportunity to comment.

Sincerely,



Robert H. Smith, Chairman
California Tribal Business Alliance

Since we have brought attention to this issue on both a Federal and State level we have notified our members of both the indian and non-indian community not to approach miners due to the threat of violence. This notification was prompted by certain statements found on various "chat forums", and of shots being fired at tribal members along the Salmon River at a New 49er Claim back in 2004. It is also interesting to note some of the most vocal advocates (Jim Foley, Mike Higbee, Jerry Hobbs) actually are moderators on these forums and allow such nonsense. I've pasted some of them to allow you to get a "feel" of what we are facing here on the Klamath River.

http://www.golddredger.com/cgi-bin/dcforum/dcboard.cgi

- My letter to white chiefs asks them to stop anything that "may" or "may not" cause any harm at all....I want em more fish to gill net!!! I want Big SMOKEHOUSE full...me like um smoked fish. Me hope um gill nets full like many moons ago...me like to fill back of pinto wagon and sell em fish for $8 pound to pale faces...me afford um much firewater. Firewater good.

- "karuks" are not just a name of a band not tribe IMHO , but are people. http://karuk.us/staff/index.php these people are the ones filing these lawsuits. In reality the karuks were hideoutbands that lost many a sqaw to early miners .

- I am having a few pints and throwing a few darts (Below this is a picture of our Vice Chairman Leaf Hillman)

- I doubt anything short of a civil war will dislodge the parasitic organisms.

- No Russ, we need to do a lot more than that. We need to beat the crap out of liberal commie loving anti-American pansies. We need to start breaking legs. They don't fear lawsuits. They have lawyers to protect them and insurance companies to cover the losses. But they will stop when they start feeling the pain. You can have all the lawyers in the world and all the most expensive insuracnes available. It don't matter. Break a leg or two and they'll be fearful of us for a long time. I'd say leg breaking is a great start...hopefully the end is that they are exiled down to Mexico or Belize or some other place where they can do their best to try to screw it up in the name of "protection"...I kind of get the feeling the locals down there are going to be much less tolerant than we have been with this kind of sh*t. See how far legal manuvers take you South of the border ELF and company...I'm laughing just thinking about it. Drive them out and kick'em in the as* as they cross the Rio Grande and season them with a little rock salt.

- Time to break legs? Brother, it was time to do that decades ago!
  Carl

- If you can't appreciate the efforts being made by the groups above and the people that support them, then I suggest that you shut up and go out and get your group of leg breakers and bring them to california or what ever state that is having these problems and start breaking the appropriate legs. Put your words to work and show us how it is done.

  We need your help Happy New Year

  Jerry (Jerry Hobbs of People for Public Lands)

- The way I see it is, if they can use things out of context, then we can too. I'm sure we could render the karuk tribe as a bunch of horse theiving, murderous, money grubbin, savages. Then prove that they have no respect for the laws they are trying to get enforced on everyone else, so they can keep raping the fisheries, environment, and gamblers.

  Trevor

- Time to play cowboys and indians-John -now quote that Leaf ass wipe!!

  Hoser John

- I Agree John but this time lets finish the job. JingleBobs

- It would be more benaficial for the native fish, If America got rid of the Indians. Billions could be saved and spent on Americans rather than a conquered race of leaches. How's that Bruce?

  John Adams

http://www.49ermike.com/ Operated by Mike Higbee Medford, Oregon

- If Mike thinks there are "racist remarks" I am sure he will act accordingly.
  (Jim Foley)

- Those guys going behind our backs was just the only way that those scum of the earth Karuk's could win this. 150 years ago we the miners would have just killed them all for this

- I haven't played cowboys and indians since I was a kid.
  Hummm

- Indians with nets harm fish. It's time to stop the horse$hit we've let the Indians get away with for the last 1oo years.
  They're a citizen, I'm a citizen. NO SPECIAL LAWS OR FAVORS FOR ANY MINORITY!!!!!
  Our forefathers shed their blood to make this country free. Do we need to follow in their footsteps to keep it that way?

- well if past practice is what gives them "the indians" the right to over fish do dope kill animals with out a hunting licence. Why isn't it the whites right to get the gold and take the indians land away from them?HAHA Wyatt

- You guys have the mining laws backing you up and i dont see how a few... what are they? what did you call them?...dont matter. crack smoking, bourbon swilling, leftist, so-called indians who hire a greenpeace lawyer commie to give the land back to them through frivolous litigation a handful of crack head indians that nobody even heard of trying to end mining as we know it is just laughable. We sent ours to Oklahoma in the 1830's.

- This anti-American activity must stop if the indian tribes are to retain any of their honor and respect from other Americans.

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November 18, 2009

Mark Stopher
CA Department of Fish and Game
601 Locust Street
Redding, CA 96001
(530) 225-2275

Re: Suction Dredging regulatory assessment

Dear Mark:
Our staff apologizes for being unable to personally attend any of the three scoping meetings due to the long travel distance and time conflicts. We have no doubt that ardent suction dredging supporters will attempt to use the scoping meetings to emotionally lobby for relaxed regulations and a quick approval process. They will understandably speak from the heart with strong support for their hobby or part-time enterprise that in many cases is their primary recreational activity. Pro-dredging speakers will likely assure State Fish and Game representatives that the scoping process is biased because the NOP/Initial Study describe so many environmental impacts from suction dredging. And they will profusely complain that any new restrictions are unjustified and unnecessary.

Rather than be swayed by emotions, the DFG should base management of the State's water and wildlife resources on the best available science, on a priority placed on water quality, and on the recognition that pleasing a few thousand dredgers must be compared with pleasing countless thousands of recreational visitors, water users, fishermen, swimmers, and a host of others who will strongly oppose any re-opening of suction dredging use on State streams and rivers.

Our non-profit center's staff urges DFG to carefully and fully consider the following field-based comments and input. Our comments are based upon observations of extensive resource degradation from the use of suction dredges. In the following comments, we will respond to the various areas of scoping issues discussed in the Initial Study and give input towards the draft EIR.

Overall, the NOP and Initial Study are well written, clearly explained, and appropriately broad in assessing the environmental impacts associated with the direct use of suction dredging and indirect impacts that are tied to suction dredging. The documents appear to provide a legally adequate basis for developing an EIR that will analyze the potential impacts of suction dredging and develop an appropriate range of alternatives for management by the State.

BACKGROUND FOR THESE COMMENTS (from John Buckley)

As executive director for CSERC, for 13 years I was a U.S. Forest Service firefighter, forest patrolman, and public contact fire prevention technician. I spent three full years driving daily throughout a vast area of the Stanislaus National Forest, checking fire permits, educating the public about forest regulations, and working to prevent resource damage.

During that time period, I spent a considerable amount of time contacting campers/suction dredging enthusiasts on national forest lands downstream of a private mining camp where suction dredging was also heavily utilized in the search for gold. I discussed suction dredging with many users of the equipment. I observed the visible rewards a few dredgers reaped from their river operations. And I personally was repeatedly appalled by the extensive biological impacts that dredging caused for the North Fork Tuolumne River, the South Fork Stanislaus River and those rivers' natural resources (both aquatic and riparian).

After leaving the U.S. Forest Service, I helped establish a non-profit organization aimed at protecting water and wildlife resources across 2,000,000 acres of the central Sierra Nevada region. Accordingly, for the past 19 years I have not only personally visited local streams and

the past 19 years I have not only personally visited local streams and rivers hundreds and hundreds of times, but I have also watched suction dredging take place on numerous occasions.

The following comments from our CSERC staff are based upon not only past, close-up observations of suction dredging, but also upon conversations I have had with recreational visitors who often were highly offended by the noise, muddy water, and overall disturbance created by dredging.

Specific Scoping Comments

As the State DFG analyzes the environmental impacts of allowing suction dredging to take place in waters of the State, it is important not to be caught up in the incorrect assessment that the current halt to suction dredging in state waters has actually thwarted opportunities for mining and the search for gold by dredging enthusiasts. The current prohibition on the use of suction dredging does NOT fully or even significantly halt mining opportunities because it still allows the use of a suction dredge above the current waterline, because it allows the use of a suction dredge with its intake pipe removed (but still using a pump to move water through a sluice box,) and because it still allows power sluicing for gold.

Thus, to be accurate, any EIR analysis should identify that extensive mining activity is still possible despite the current prohibition against suction dredging below the current waterline or with the intake pipe removed or where miners utilize power sluicing for gold.

Furthermore, in terms of comparing the current period (with the highly publicized prohibition) with past levels of dredging use, **it is critically important for the EIR to acknowledge that enforcement of the prohibition is spotty, at best, and that many prohibitions will routinely be ignored since enforcement is not a top priority.**

Accordingly, in the EIR, it is essential for the document authors to capture the fact that legal methods of suction dredging operation may not be the only methods utilized -- especially in remote areas where

there are no close-at-hand enforcement personnel to monitor and to "catch" miscreants. As an example, in reality, despite the method limits described under 4.2.2 of the Initial Study concerning legal methods of operation, my personal observations of many users of suction dredging equipment is that they routinely suction dredge into the bank. In fact, it is my expectation that dredging into the bank is second only to dredging in the stream/river at the base of submerged boulders or in bars of gravel.

CSERC asks that the EIR fully acknowledge that due to the extremely low level of law enforcement capability of DFG or other associated authorities to monitor and enforce suction dredging regulations, many dredging users will float their pontoon-buoyed dredge into locations where visiblity from roads is limited or impossible. Thus, activities that are not in compliant with dredging regulations are extremely difficult to observe and penalize. Thus, **the EIR alternatives should consider fully the difficulty in enforcing dredging regulations and acknowledge that a reliance on self-enforcement is often the norm, rather than DFG personnel or other agency personnel being in a position to manage/control suction dredging usage.**

In my personal experience, I have observed many other non-compliance actions -- such as suction dredging enthusiasts digging into the riverbank above the stream and shoveling material into the river for suctioning. Unless an enforcement official is literally wading upstream along a river or stream, he or she may never be in a position to observe such violations due to screening of the dredging activities by willows, alders, or other riparian shrub or tree species.

Additional issues of high concern that deserve intensive analysis and consideration in the draft EIR include:

1) As DFG is fully aware, macro-invertebrates are the base of the food chain for aquatic and even for many riparian species. Thus, when macro-invertebrates are negatively affected by suction dredging, they suffer due to significantly degraded water quality, direct entrainment, pollution from petroleum leaks/spills, and the overall alteration of the stream habitat. In particular, it is the high level of sediment that is

stirred up or discharged into the stream that converts an often-clear water body into a brown or reddish brown sludge or milky river of mud.

Impacts to macro-invertebrates in the DEIR should be carefully and fully connected to how those impacts to macro-invertebrates then affect Special Status wildlife species and other aquatic or riparian species that are part of the food chain based on macro-invertebrates.

2) On one hand the DFG is attempting to develop a environmentally-acceptable fish stocking and hatchery program that will not pose significant risk to threatened and declining amphibian species. At the same time, DFG is considering management alternatives that would allow the use of suction dredges -- potentially in streams and rivers in suitable habitat that is valuable or essential for these same threatened and declining amphibian species.

Accordingly, in addition to considering the many obvious and less than obvious impacts that the use of suction dredges causes for at-risk amphibians species, it is essential under CEQA for the DFG to consider the cumulative impacts of suction dredges combined with fish stocking combined with climate change, combined chytridiomycosis, and combined with all the other clearly identified impacts that harm at-risk amphibian species.

While the DFG does not have the ability to manage or control climate change or livestock grazing impacts on amphibian habitat or the chytrid fungus, the DFG does have the capability to control fish stocking and suction dredging. Thus, any risk to Special Status or T&E wildlife species or warranted-but-precluded wildlife species must be considered to be significant in terms of the additive impacts combined with all of the cumulative impacts that DFG does not control.

Please recognize that the above argument will be a key one for groups such as our Center that are certainly ready to litigate against the State if a CEQA-compliant analysis is not the end product for suction dredging management.

In addition to the cumulative impacts to amphibians which suction dredging exacerbates, it is important for the draft EIR to acknowledge that amphibians, similar to macro-invertebrates, also suffer due to significantly degraded water quality, direct entrainment, pollution from petroleum leaks/spills, and the overall alteration of the stream habitat. The high level of sediment that is stirred up or discharged into the stream may significantly interfere with amphibians having successful feeding, breeding, or simply survival. In addition, there is almost always the potential for dredging to suction the egg masses and tadpoles of amphibians.

In the local region of the central Sierra Nevada, foothill yellow-legged frogs and other species may produce eggs masses in the shallow waters along rivers and streams where suction dredging occurs. With such incredibly low numbers of foothill yellow-legged frogs persisting in the local region, the relatively few population pockets of such frogs are especially vulnerable to extirpation if even a small percentage of their eggs are affected.

One of the key research findings of those studying the foothill yellow-legged frogs over recent years is that disturbance by fish or other predators tearing at the sides of egg masses not only consumes some eggs/tadpoles, but it often introduces fungal contamination that wipes out the remaining eggs. Thus, even where suction dredging does not suck in an entire egg mass, there is a potential for the entire egg mass to be lost if intrusion into the mass causes fungal spread through the remaining eggs.

The DEIR should carefully and fully assure that at-risk amphibian populations, both known and not yet discovered, are adequately protected from the negative impacts of suction dredging through appropriate regulatory limits, including a very narrow season of use, elimination of use in all stretches where known populations of at-risk amphibians exist, and in stretches with high suitability for either sustaining at-risk amphibian species or where the suitability can enable restoration or re-colonization to occur.

3) Similar to the effects of suction dredging upon macro-invertebrates and amphibians, it is inarguable that suction dredging creates a significant negative impact overall in the State on a wide variety of fish species. Similar to the problems created for the macro-invertebrates and amphibians, dredging obviously causes intensive alterations in water quality (converting clear to pristine water quality into temporarily mud-laden, silt laden, often contaminated water. The turbidity is frequently intensive, violating State Water Board standards for streams with relatively clear water prior to the dredging.

The DEIR should carefully assess how the State can assure (under any adopted management alternative for suction dredging) that all at-risk fish species (be it a Special Status species, a warranted-but-precluded species, a T&E species, or a Forest Service sensitive species) will be ensured of protection from any significant impact caused by suction dredging -- including temporary water quality turbidity that exceeds State standards, including suctioning of fry and eggs or juveniles, including the disturbance of young fish so that they become more vulnerable to predators, and including the disturbance of the stream/river bottom so that heavy metals are released into the water body and absorbed by the fish.

4) The current Initial Study does not fully describe how extensive impacts the negative impacts from suction dredging can be for downstream water users, including recreational users. **This issue should be expanded upon and underscored in the DEIR as a highly significant negative impact.**

It is my experience from working as a public contact "ranger" for the Forest Service that people who came to the river for a wide range of recreational activities were strongly and adversely opposed to staying in an area close to or downstream from active suction dredging.

The noise of the dredge pump is annoying and the antithesis of what many are traveling so far to attempt to experience -- especially on public lands along flowing rivers. Then the muddy water that moves downstream for hundreds of feet to a quarter mile or further is a direct turn-off to those wanting to swim, wade, fish, or play in the water. In

addition, the presence of dredgers' camps in close proximity to the water often discourages recreational day visitors from feeling comfortable entering an area where they may be accused of intruding into the camping "space" of dredgers.

The result of the above is that when frequent suction dredging takes place, especially in popular areas such as below Italian Bar bridge on public lands downstream of the private mining camp, recreational visitors quickly leave to go elsewhere and over time, most local recreational visitors simply stop coming to that stretch of river.

The noise caused by suction dredging creates such a conflict with quiet recreation that the impact should be considered a highly significant negative impact that cannot be mitigated.

5) **Domestic water supply streams and rivers should not have suction dredging allowed to take place on those waters due to a variety of contamination issues**. First, the direct effects of siltation and turbidity affect water quality for an extensive area. There is an inaccurate statement in the Initial Study on page 43 that states that the effects of dredging are localized in that they do not extend beyond the immediate area dredged. It is my personal conclusion from many observations of suction dredging that the heavily silted water can extend for at least as far as one-quarter mile downstream in low flow rivers such as the South Fork Stanislaus. In higher flow rivers, it may be true that dilution occurs more rapidly, but in many streams and lower flow rivers, the muddy water chokes the river for hundreds and hundreds of yards downstream.

Second, there is the issue of contamination by petroleum products caused by spilling gasoline while filling dredges floating on pontoons or other inflatable rafts while still in the stream. I have personally watched slightly inebriated dredgers fumble with the gas can and pour gas directly into the river by over-filling their dredge pump. Likewise, on at least one occasion, I saw a drizzle of oak dripping into the South Fork Stanislaus as a dredger used a dilapidated dredge set-up on its last legs. **The DEIR should fully acknowledge that while the overall amount of petroleum contamination may not be major, any violation of**

State water quality standards must be considered significant in streams or rivers that are domestic water supplies.

The Initial Study states on page 19 that most dredging takes place during the summer when flows are lower and water temperatures are higher. However, while the document may or may not be accurate in suggesting that water clarity may be the greatest during the popular summer season, there is no arguing with the fact that during periods of very low flows in streams or rivers, the sediment disturbance from dredging makes an even more significant rise in silt content in the water. That immediately degrades significantly the previously clear water quality. This is especially true if the State allows large nozzles and large pumps to be used. In the Initial Study, the document provides information on the amount of sediment moved by a dredge nozzle with a diameter up to 8." At such a large nozzle size, the amount of sediment moved by one suction dredge can be up to nearly 200 cubic yards per day.

All of these ways that suction dredges contaminate water supply streams and rivers should be fully and carefully analyzed in the DEIR. Likewise, any alternative for management should reasonably be designed so that no significant amount of sedimentation into streams and rivers is possibly allowed and that contamination by pumps-petroleum products is not tolerated and is not even potentially able to happen on streams and rivers that serve as domestic water supplies.

6) **It is important for the DEIR to carefully consider the associated impacts that allowing suction dredging will lead to in terms of encampments close to their work site**. Many dredgers do not stay at the privately owned encampments, but take their dredges onto public lands to dredge where they feel less mining disturbance has occurred than at already high graded sites. At both public and private sites, dredgers' encampments will frequently not have adequate sanitation due to being located too close to the stream or river, no bathroom facilities, and river canyon hillsides that are too steep to allow climbing up at least 100' from stream to go to the bathroom. Thus bodily wastes and trash often become an associated impact that may produce less

water contamination than the petroleum pollution or the sedimentation, but which cumulatively adds to water quality problems as well as to disturbance to aquatic wildife species.

7) As noted previously, noise is one of the major ripple effects from suction dredging. Similar to having an ATV whine loudly past non-motorized recreational visitors, having the suction dredge running is highly annoying to humans who are not part of the mining experience. Noise is especially a significant concern in steep river canyons where very low flows of water during the summer season mean minimal natural noise of river flow to help to cover over the sound of the whining pump. Instead, in such low flow river segment areas, the relatively silent seeping flow of the summertime river may provide little to zero river sound to mask the strong echoing noise of the suction dredge. **The significant negative impact of noise for the majority of recreational visitors is a problem that needs to be carefully addressed in all of the action alternatives in the DEIR.**

8) The scenic impacts to visual resources of suction dredging can be relatively minor in some situations to relatively significant in many other situations. **Any alternative brought forward for consideration of adoption by DFG should reasonably ensure that visual resources will not be significantly degraded.** During the summer season, the attraction of streams and rivers is often pivotal to a satisfying tourist or visitor experience in many rural areas. Muddy water that looks like sludge in a narrow, small river or stream can so dramatically appall visitors that they may believe that the local watershed is environmentally unhealthy and even potentially unsafe.

Thus, every alternative brought forward for management approval should carefully ensure that mitigation conditions are in place to require that no significant digging take place along the river's edge, that no suction dredging be allowed where extensive sediment will pollute stream or river segments important for tourism or important for scenic values.

9) As noted in passing in a previous comment, suction dredging disturbance of deposited mercury and other heavy metals often releases these long-held metals into the stream or river -- threatening aquatic species as well as recreational visitors/downstream users.

In stream or river segments where old mercury contaminants are still present, all alternatives should ban any suction dredging until such time that the State can assure that all heavy metals in the water body have been safely removed.

10) Based on the already extensive amount of information in the Initial Study, it is obvious that the use of suction dredging creates an impact of substantial significance. **CSERC's staff scientist and executive director both strongly agree with the mandatory findings of significance on page 96. We believe that under CEQA, the DFG thus has a legal obligation to adopt all feasible mitigation measures that may reasonably be expected to reduce the level of significance of the impact.**

It is essential that in this planning process, the DFG fully complies with CEQA, with state and federal wildlife protection requirements, with Clean Water Act and various state water regulations, and with a wide range of other environmental requirements.

DFG should develop a proposed action alternative that would do all of the following:

a) Ban any use of suction dredging in all streams and rivers in the state that are now designated as State or Congressionally listed Wild and Scenic segments;

b) Ban any use of suction dredging in all streams or river segments where dredging poses any risk to T&E wildlife or plant species, Special Status state-designated species, U.S. Forest Service sensitive species, warranted-but-precluded species, or other highly at-risk wildlife or plant species that would be affected by water quality degradation, active mining activities associated with the

suction dredging, or the wide range of other cumulative impacts that in total add up to affect biological resources.

c) Restrict the use of suction dredging to only those water bodies that are not a domestic water supply.

d) Restrict the use of suction dredging to only those stream reaches or river segments that do not have moderate to high potential to contain mercury deposits or other heavy metals that might be released into the water body by suction dredging.

e) Restrict the use of suction dredging to only water bodies where the use of such equipment and methods will not cause any significant impact to scenic/visual resource values.

f) And finally, in those water bodies that are not eliminated from suction dredging use based on the above criteria, that suction dredging is only allowed to be used where no more than minimal levels of regulatory violations occur. If numerous violations of dredging regulations occurs, the State should include in the proposed action alternative the management authority to close any river or stream segment from dredging use where persistent violations occur.

Thank you for considering these early scoping comments. Please ensure that our Center is made aware of the availability of the DEIR or new public meeting beyond the initial scoping workshops.

Respectfully,

John Buckley, executive director Lindsey Myers, staff biologist

Friends of the North Fork
2810 Kadema Dr.
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December 3, 2009

Mr. Mark Stopher
California Department of Fish and Game
Suction Dredge Program Comments
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

I am writing on behalf of Friends of the North Fork to submit our comments on the Initial Study for the Subsequent Environmental Impact Report on the Department's Suction Dredge Permitting Program.

Program Objectives

On page 4, under Program Objectives, one program objective is to promulgate regulations as necessary that effectively implement Fish and Game Code section 5653 and 5653.9 and other applicable legal authorities. This SEIR is partially funded by the State Water Resources Control Board so that the Board can use its findings to determine whether the resulting DFG regulations satisfy the various water quality statutes enforced by the Board. This must be included in the program objectives, including information on how the program would comply with the Clean Water Act and other water quality and beneficial use laws under the Board's jurisdiction. This program objective should specifically cite the Board's compliance duties as an objective.

In addition, the Program Objectives should reflect the Department's obligation to comply with Fish and Game Code Section 1600 et seq, Streambed Alteration Agreements. As Friends of the North Fork noted in its June 21, 2007 letter to then-Department Director Ryan Brodderick, the Department's failure to require suction dredge permittees to comply with the state's Streambed Alteration Agreement statutes violates the courts' long-standing presumption against "implied repeals." The courts have regularly and consistently stated that all laws on a similar subject must be given full force and effect, unless it is impossible to rationally do so. The state's laws regarding suction dredging

and streambed alteration agreements are not so fundamentally incompatible that one must be pre-empted by the other.

We do not find in the initial study any consideration of the Department's enforcement capabilities in the analysis of whether there will be deleterious effects on fish from suction gold dredging activities. This activity has a high percentage of participants who reject compliance with regulations that might prevent harm to fish species. The Department has frequently indicated that it does not have sufficient enforcement personnel to assure compliance. Making matters worse, it is our understanding that the State Water Board, which has no personnel to enforce water quality standards, is contemplating delegating that responsibility to the Department. Program Objectives of this initial study must include the consideration of Department enforcement capabilities and provisions adequate to prevent deleterious effects on fish.

Applicability

On page 5, under Applicability, the initial study has a list of activities not considered suction dredging for purposes of the Proposed Program. These include "high banking" outside the water line and power sluicing. Both of these activities involve the use of engine-powered suction equipment to excavate the stream or river bed. As opposed to an operation in which the entire dredging operation is conducted instream, in high banking and power sluicing, the processing of the suctioned materials is outside the active waterway. However, the processed silt and sediments may not settle out before returning to the river; settling holes can be relatively large and remain after the activity is complete; and the operation can cause serious erosion of the stream bank and adjacent land surface. The initial study adopts these existing exclusions with no consideration of the instream impact of these activities and with no analysis of whether they are not suction dredging as defined by Section 5653. There is nothing in Fish and Game Code section 5653 that limits the definition of suction dredge equipment to only those operations that return the rejected material to the waterway.

On page 7 and 8, the initial study accepts a previously adopted definition of "deleterious effect" to mean (1) Catch, capture, kill, or injure a species listed as candidate, threatened or endangered under the state or federal Endangered Species Act; (2) A substantial reduction in the range of any species, and/or extirpation of a population; (3) A fundamental change to the structure of a community or stream ecosystem, including substantial reductions in biodiversity or resiliency to disturbance, resulting in the reasonably foreseeable consequence of (1) or (2) above."

"Deleterious" means harmful, a far lower standard than disastrous. The Fish and Game Code does not use any wording beyond "deleterious" to describe impact to fish species

sufficient to deny a dredge permit. "Catch, capture or kill," "extirpation," and "substantial reduction" are nowhere to be found in the statute's standard of harm to fish species. Nor does the statute say that only impacts to candidate, threatened or endangered species are to be considered. There is nothing in the statute nor in a common sense plain meaning of the word "deleterious" to support such a dire definition.

CEQA Issues

We are pleased that the Department has determined that the appropriate baseline for purposes of CEQA and the Subsequent EIR is the present situation of no dredging in California.

However, it has long been the position of Friends of the North Fork that the Department's failure to require environmental review of suction dredge permits on a project-by-project basis violates both the state's suction dredging statutes and CEQA.

As we noted in a June 21, 2007 letter to then-Director Ryan Brodderick,

> "...the suction dredge statute, itself, evinces the Legislature's intent that the Department should evaluate the project-specific effects of each suction dredging "operation" before issuing a permit: "If the department determines, pursuant to the regulations adopted pursuant to Section 5653.9, that the operation will not be deleterious to fish, it shall issue a permit to the applicant." The fact that the statute envisions project-specific site inspections and determinations to be made by the Department, at least for some of the suction dredge permits it issues, further indicates the Legislature's intent that the Department consider the impacts of suction dredging on a permit-by-permit basis.
>
> "The substantive law governing any particular agency approval determines whether sufficient agency "discretion" is being exercised to trigger CEQA's environmental review requirements. Thus, the Department's implied conclusion in its 1994 EIR that no further environmental review should be required for individual permits is not dispositive of the question of whether CEQA review is actually required by law. Rather, the question is: does the Department, under the suction dredge permitting statute, have the ability to refuse issuance of the permit due to its adverse environmental effects, or to impose conditions on the permit to reduce or avoid those effects?
>
> "In this case, the Department's apparent reliance on its 1994 EIR to issue suction dredging permits to any and all persons who submit the requisite fee is not consistent with CEQA's or section 5653's requirements. The Department

> clearly has the authority to refuse approval of a suction dredging permit to avoid its adverse environmental effects: section 5653, on its own terms, only authorizes the Department to issue a suction dredging permit upon a finding that the "operation" will not be deleterious to fish."

Friends of the North Fork still believes that if the Department fails to perform a site specific analysis in this new SEIR, then it needs to create a permit system that is site specific and that will condition the issuance of a permit on an analysis of the proposed location of a dredge mining operation. Otherwise, the Department will have no way to make the determination that a particular proposed dredging activity will not have a deleterious effect on fish.

Site specific analysis of the North Fork of the American River

Such a site specific EIR or site specific permit process would take into account the many different natural conditions on the many different California waterways. In the case of the North Fork of the American River, for instance, it would reflect:

1) The Department's own 1998 recommendations for the protections for the foothill yellow-legged frog:

> "The current season for this reach of the North Fork American River is from the last Saturday in May extending thru October 15. In some years the existing season may not be adequate to protect the breeding period (of the yellow-legged frog), e.g. below normal water years. Therefore a modification of the existing season is warranted to allow a majority of the tadpoles to reach sub-adult stage where they would be able to escape any suction dredge activity. This drainage has unique characteristics for both icthyofauna and herpetofauna, evidenced by strong populations of native minnows and amphibians. The development of more restrictive regulations that would protect these resources is warranted."

2) The Department's own conclusions about the possible presence of red-legged frogs in the North Fork Canyon, in which Department biologists noted that there is suitable habitat available and that "the extensive riparian vegetation and cover does not rule out the possibility of red-legged frogs being present in the canyon."

3) That UC Davis biologists now suspect that the trout present in the North Fork (which is not stocked by the Department) are remnant Central Valley steelhead that have adapted under difficult circumstances to the presence of downstream dams.

4) The presence of elemental mercury in the river bed left from historic upstream mining. We know from historical reports on hydraulic mining that some 200,000 pounds of mercury were "lost" into the North Fork American every year for about 10 years from the hydraulic mining activities at Gold Run alone. Mercury is still entrained in the river gravel and is transported downstream during storm events. It is present in pools of elemental mercury, and it is present in the sediments churned up by suction dredging activities. Any stream, the North Fork included, where such quantities of mercury are present must remain closed to suction dredge mining until the mercury has been safely removed.

We appreciate this opportunity to submit our comments on the Initial Study for the Subsequent Environmental Impact Report on the Department's Suction Dredge Permitting Program. We request the incorporation of the following documents already submitted by Friends of the North Fork to the Department and to the State Water Resources Control Board: our comments to the Department dated November 3, 2007 in response to the Department's request for information on the impacts of suction dredge mining; our comments to the SWRCB dated June 12, 2007 in connection with the Board's public hearing on suction dredge mining impacts on water quality; and our letter and legal memorandum to the Department dated June 21, 2007 concerning the Department's permitting of suction dredge mining.

Sincerely,

Alison Harvey
On Behalf of Friends of the North Fork

From: scott <scott@icmj.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 12:27 PM
Subject: Suction Dredging Permitting Program
Attachments: Joseph-Greene-suction-gold-dredge-study.pdf; Joseph-Greene-suction-gold-dredge-study.doc; Claudia Wise on SB 670.pdf; Claudia Wise on SB 670.doc; The Economic Impact of Suction Dredging in California.pdf

**(Peer reviews by Joseph C. Greene and Claudia Wise are provided in both Microsoft Word and Adobe pdf format for your convenience. These documents may also be downloaded from our website at www.icmj.com or by clicking on the links at the bottom of this page.)
December 3, 2009
Mark Stopher
California Department of Fish and Game
601 Locust St
Redding, CA 96001

Mr. Stopher,

Thank you for the opportunity to provide comments on the initial scoping study for the suction dredge permitting program for California.

I have been the editor, publisher and owner of /ICMJ's Prospecting and Mining Journal/ for ten years. The magazine was originally established in 1931 as the /California Mining Journal/ and has been based in California since its inception. I also worked for the magazine prior to purchasing it, beginning in 1982. I began suction gold dredging in 1983, and have used suction gold dredges in both California and Oregon waterways. I believe my personal and professional experience provides valuable expertise in the area of suction gold dredging.

I have spent a considerable amount of time examining the initial study document and summary of available studies recently released for comments. Nowhere in those documents are the overriding laws listed or discussed, including the grants afforded miners by the mining laws from 1866 to present. While I'm sure you are aware that no regulations can be changed or implemented without considering the laws pertaining to mining, I am also aware that the various mining laws and grants are covered in comments submitted by Public Lands for the People and others, so I will not duplicate their efforts here.

The majority of the material cited in the Notice of Preparation was published prior to the original EIR in 1994 and subsequent attempt at a new EIR in 1997. The research material listed after that date is inadequate to support a change from insignificant to deleterious. In fact, I was unable to locate any definitive studies that make this conclusion; rather, the literature cited is ripe with speculation, often using words such as "may" cause or "could" cause harm to fish or their spawning areas.

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Joseph C. Greene, a retired U.S. EPA research biologist, provided a peer review of available studies on suction gold dredging to the State Water Resources Control Board (2007). He concluded, "The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests."

Claudia Wise is a retired U.S. EPA physical scientist/chemist. She provided a peer review of available studies to Governor Schwarzenegger prior to the passage of SB 670 (2009). She stated, "Dozens of peer-reviewed journal articles some commissioned by the USEPA, USGS, CDFG, Corp of Engineers, and many more from universities support suction

dredging as having de minimis effects or no significant effect on the environment they are used in. Nothing has changed in peer-reviewed literature since that time to change this fact."

Page 41 of the scoping literature states that mercury is discharged into our waterways by suction dredges. This is dishonest at best. Mercury is a heavy metal that settles at or near the bedrock due to its high specific gravity so it often gets vacuumed up and entrained in the dredge's riffles along with other heavy metals and minerals. One study cited in the scoping document claimed that approximately 98% of the mercury was recovered during a test. The study went on to claim that the remaining 2% could cause problems through fish contamination and methylation. Claudia Wise addresses this concern in her peer review:

/The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

Mercury is continuously moved every winter in high storm events. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been transported to the Sacramento–San Joaquin Delta and San Francisco Bay by sustained remobilization (James, 1991). Providing a program to collect mercury from miners would aid the Water Board's mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern.

In the test described by Humphreys (2005) a small portion of floured mercury was collected in the sediments as it escaped the sluice box. This mercury whether floured before it entered the sluice box, or not, would still be in elemental form. Regardless of surface area it would be no more toxic then the other 98 percent that was suggested to be left in place.

Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and San Francisco Bay (USGS 2000).

If not collected the mercury is guaranteed to end up farther downstream, and eventually in the delta or the bay, where methylation is a real environmental problem. In my opinion it would be a highly irresponsible management practice to leave a large portion of mercury in the rivers and streams because of unrealistic concerns for the lesser amount moving only a short distance away from an operating dredge. Most likely if floured the movement of fine mercury would extend no farther than 50-feet off the end of the sluice box. That would relate to the distance a turbidity plume might extend downstream from a small-scale suction dredge.

However, if the mercury was left in place the next storm event would surely move it downstream closer to, and eventually into, the bay and delta. In fact, according to Humphrey's study in 2005 mercury was seen moving down stream and re-deposited on bedrock already dredge cleaned. The important fact here is mercury was flowing down stream in a suction dredge free zone during lower river flows than what take place under high winter river conditions.

It is most important to reduce the total amount of mercury in the streams and rivers and its transport downstream into the bays and deltas. This is defined as a part of Total Maximum Daily Load ("TMDL") goals.

We know for certain that mercury is transported downstream throughout the winter season during high water events. *Therefore, anytime there is the possibility for the removal of mercury by miners it should be undertaken and supported.* (Emphasis added.)/

Mr. Josiah H. Cornell III is retired from the USDA Forest Service in Oregon. Cornell addressed many of the issues related to spawning of salmon in his own study of suction gold dredging. Cornell stated:

/Salmonids spawned in the vicinity of the previous season's dredging, but, in one study, salmonids redds were not located in tailing piles. The gravels dispersed by the high stream flows, which included dredge tailings, certainly composed a portion of the suitable spawning gravels each year. Dredge tailings have been observed to provide good salmonid spawning ground due to the loose condition of the sand and gravel. In some places, mining debris may provide the best or only habitat.

A five-inch dredge could improve the intergravel environment for both fish eggs and benthos. *Weighing all factors, dredging can improve the gravel environment for both fish eggs and aquatic insects.* (Emphasis added.)/

Mr. Greene, Ms. Wise and Mr. Cornell have extensive experience relevant to the upcoming EIR on suction gold dredging, including water quality, temperature, turbidity, fish, biota, and related topics. As we have recently learned from the release of emails indicating fraud involving the IPCC's climate change reports, some scientists have a desire to skew results whether it be motivated by continued monetary grants, personal or political agendas. Mr. Greene, Ms. Wise and Mr. Cornell are now retired from their respective government agencies. They are no longer dependant on grant money, nor are they required to adapt to an agency agenda to maintain employment. For these reasons, their opinions should carry a much stronger weight in this process.

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gold will be missed.

Table 1 states a miner utilizing a 4-inch dredge will move 1 to 5 cubic yards per hour. In my experience, I moved approximately 2 cubic yards of material *per day* with a 4-inch dredge averaging 6 hours with the dredge in operation, or 0.333 cubic yards per hour. Based on my personal and professional experience, I believe 0.333 cubic yards per hour is a realistic amount for any miner using a 4-inch dredge. Each miner is looking to recover as much gold as possible, not to just move material. While a dredge can surely move more material, the miner's goal is to clean out the cracks and crevices to recover the gold, which is a time-consuming process. Much of the miner's time is spent cleaning out those cracks and crevices, hence the lower volume of material processed.

I understand that the economic impact may not be considered until later in the process. However, I'm including a recent study I completed with the assistance of Pat Keene of Keene Engineering, a major suction dredge manufacturer, and Rachel Dunn of Gold Pan California, a retail mining store. Based on the results of that study, we found that suction dredging has a minimum economic impact in California of $65.46 million, not including several major categories like payroll and property taxes, commercial retail rents, trade magazines, and more. The study was conducted when the gold price was $871.86 per troy ounce. With the current gold price at $1,215 per troy ounce, and many unemployed citizens looking toward gold mining as a way to make ends meet, the current economic impact should easily exceed $100 million in my professional opinion.

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C. Harn, Scott; Dunn, Rachel; Keene, Pat; "The Economic Impact of Suction Dredging in California," ICMJ's Prospecting and Mining Journal, Vol. 79 No. 2, pgs 37-38, Sept. 2009.
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ATTACHMENT A

State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, California 95812-0100
Fax: 916-341-5620
email: commentletters@waterboards.ca.gov

June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent.***" The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates.***

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging***" (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

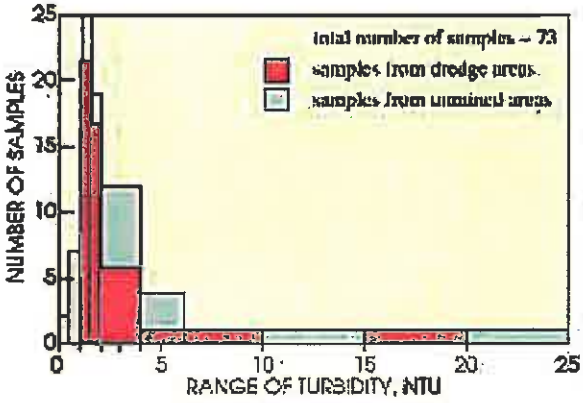

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

"Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal" (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River.... The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem... At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about *0.2 percent.* The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only *0.1 percent.*" The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, ...has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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ATTACHMENT B

The Honorable Governor Arnold Schwarzenegger
State Capitol Building
Sacramento, CA 95814
Fax: 916-558-3160

Dear Governor Schwarzenegger,

PLEASE VETO BILL SB670 (anti-suction dredging legislation)

My name is Claudia Wise; I retired in 2006 after 32 years of civil service with the U.S.EPA as a physical scientist/chemist. I have been a member of many scientific projects over the years starting my federal career in the Fish Toxicology arena and ending it with the Salmon Restoration division. I have worked on projects ranging from urban fish populations and fish avoidance testing to eelgrass habitat and global climate change. I have been and remain to be a strong proponent of protecting the environment.

On October 11, 2007 in regards to AB 1032 I wrote to you regarding another attempt by the legislature to get around a court order and unnecessarily put a large group of miners and businesses out of work with no scientific evidence to support their claims.

Dozens of peer-reviewed journal articles some commissioned by the USEPA, USGS, CDFG, Corp of Engineers, and many more from universities support suction dredging as having *de minimis* effects or no significant effect on the environment they are used in. Nothing has changed in peer-reviewed literature since that time to change this fact.

Suction dredge mining has little impact on the areas fish and biota. In relation to natural occurrences suction dredge mining is insignificant. To put the impact of suction dredge mining into perspective it was calculated that suction dredge mining disturbs only 0.7% of the sediment that is moved naturally in a year. The Siskiyou National Forest (SNF), where this study occurred, is a very prominent mining area in California.

According to the U. S. Forest Service, SNF, "There are 1,092,302 acres on the Siskiyou Natural Forest. Using a factor of 0.33 cubic yards per acre per year times 1,092,302 acres will produce a very conservative estimate that 331,000 cubic yards of material move each year from natural causes compared to the 2413 cubic yards that was moved by suction dredge mining operations in 1995. This would be a movement rate by suction dredge mining that equals about 0.7% of natural rates." (Cooley 1995).

California Department of Fish and Game already regulates the miners out of the waterways during important life events for the Salmon. That includes during spawning season when redds are present.

It is well known that suction dredging causes little or no environmental harm to fish and biota what many overlook are the many benefits that dredging provides such as increased spawning gravels, dredge made refugia, and yes, mercury remediation to name a few.

Suction dredging breaks up cemented riverbeds providing fish with loose gravel for future spawning grounds in areas fish presently are not able to use for spawning. Between 1996 and 1998, Quihillalt (1999) found 4% of redds where located on or within 1000 m of dredge tailings. He theorized that dredge tailings may be attractive sites for redd construction because tailings are often located near riffle crests where fish frequently spawn, and they provide loose, appropriately sized substrate. However, embryos in tailings may suffer high mortality during years of high river flows (1998) and be of no concern during years of low river flows (1996 & 1997).

During a later survey on the Klamath River during 2002 only one redd was observed on suction dredge tailings. Recreational suction dredge mining was present throughout the survey from the Highway I-5 Bridge to Happy Camp (Schuyler and Magneson. 2006).

Even with scouring effects to redds reported in scientific literature this gravel provides areas to spawn that would not otherwise be available to them. Any added benefit to increasing salmon productivity, using suction dredging, is a benefit to fish numbers. Even during years of high mortality due to high flow events if only a few of the embryos survive that may be more than would be expected without the benefit of added spawning gravels provide by the tailings.

I have been involved in temperature surveys on the Klamath River in California in regards to suction dredge activity and existing conditions of refugia. We have found natural refugia to be no better in many cases to that of dredge made refugia.

Dredge holes can provide a holding place for fish as they pass up the waterway on their migration path to and from the ocean providing a place to get out of the faster currents to rest. Some of these dredge holes may also be cooler due to ground water seepage if the holes are deep enough. This leads to development of additional areas of needed refugia.

Another Benefit the suction dredge community could provide the state with is mercury remediation. In talking with miners, the majority typically do not run into large pools or hot spots of mercury. However, their concerned for the environment is the same as other citizens. Miners have shown the willingness to hand over collected mercury to a collection facility if such a facility exists. The California State Water Board's Water Quality Division report (Humphreys, 2005) suggested the idea of paying the miner's for their efforts would help facilitate this plan. Collection facilities have been provided in the past with great response.

The California Water Board has spent a lot of time and money on mercury remediation projects with limited success, though in 2001 EPA Region 9 located in San Francisco, California did collect mercury from miners very effectively. Collections of mercury has been happening in Oregon and Washington through the states respective Division's of Ecology and with even greater success at miner's rallies.

Even though EPA Region 9 has ended this program and removed it's existence from the website EPA, Region 9 had a mercury "milk run" in 2000. Agency personnel were able to collect 230 pounds of mercury from miners and local dentists. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. (US EPA, 2001.)

Over the past four years, the Resources Coalition and other small-scale miners associations in Washington have turned in 127 pounds of mercury and eight pounds of lead for safe disposal with the help from the Washington Department of Ecology. Ecology staff attended miners' rallies in Oroville and Monroe, explaining the state's program for proper disposal of lead and mercury. (ENS 2007).

The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

Mercury is continuously moved every winter in high storm events. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been transported to the Sacramento–San Joaquin Delta and San Francisco Bay by sustained remobilization (James, 1991). Providing a program to collect mercury from miners would aid the Water Board's mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern.

In the test described by Humphreys (2005) a small portion of floured mercury was collected in the sediments as it escaped the sluice box. This mercury whether floured before it entered the sluice box, or not, would still be in elemental form. Regardless of surface area it would be no more toxic then the other 98 percent that was suggested to be left in place.

Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and San Francisco Bay (USGS 2000).

If not collected the mercury is guaranteed to end up farther down stream, and eventually in the delta or the bay, where methylation is a real environmental problem. In my opinion it would be a highly irresponsible management practice to leave a large portion of mercury in the rivers and streams because of unrealistic concerns for the lesser amount moving only a short distance away from an operating dredge. Most likely if floured the movement of fine mercury would extend no farther than 50-feet off the end of the sluice box. That would relate to the distance a turbidity plume might extend downstream from a small-scale suction dredge.

However, if the mercury was left in place the next storm event would surely move it downstream closer to, and eventually into, the bay and delta. In fact, according to Humphrey's study in 2005 mercury was seen moving down stream and re-deposited on bedrock already dredge cleaned. The important fact here is mercury was flowing down stream in a suction dredge free zone during lower river flows than what take place under high winter river conditions.

It is most important to reduce the total amount of mercury in the streams and rivers and its transport downstream into the bays and deltas. This is defined as a part of Total Maximum Daily Load ("TMDL") goals.

We know for certain that mercury is transported downstream throughout the winter season during high water events. Therefore, anytime there is the possibility for the removal of mercury by miners it should be undertaken and supported.

You justifiably vetoed that last bill because it was unnecessary and suction dredge mining is already regulated by the Department of Fish and Game. But here we are again....

There was no reason, last year, to sign AB1032 into law and there is no reason to sign Bill 670 into law this year. I respectfully ask that you not add further to the problems related to increased government regulation where none is warranted. Please allow

California Fish and Game to do their job. They are already regulating suction dredging adequately to protect fish. The court has ordered California Department of Fish and Game to prove suction dredging creates significant harm before changing the mining regulations.

I respectfully ask that you VETO bill 670.

Sincerely,

Claudia Wise
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ATTACHMENT C

The Economic Impact of Suction Dredging in California

It Starts With the Statistical Analysis Completed by the State of California

An Environmental Impact Report on suction gold dredging was completed by the State of California in 1994. As part of this process, the State sent out two survey questionnaires. The first questionnaire was sent to over 4,000 individuals. Nearly 2,000 were returned completed. The surveys covered dredge locations, annual spending activity, amount invested in dredging equipment, nozzle size and related questions. The second survey was sent to county Boards of Supervisors, Chambers of Commerce and mining businesses to determine the importance of suction gold dredging on local economies. A sample of 1,257 of the individual surveys was used by the State to complete a statistical analysis.

The State of California determined, "Suction dredging is an activity that requires a substantial investment."

According to the State, each dredger spent approximately $6,250 on expenses, which included groceries, restaurants, motels, camp fees and other living expenses. In addition, they reported spending about $3,000 each on gas, oil, equipment maintenance and repairs to suction dredge equipment.

The surveys also found that each permit holder spent an additional $6,000 to purchase a suction dredge and related equipment.

It Includes the Number of Suction Dredge Permits

According to the California Department of Fish & Game, 3,523 permits (2,966 resident and 557 non-resident) were issued in 2008. The State of California collected $126,055 in resident permit fees, and $93,158 in non-resident fees in 2008, for a total of $219,213.

Adjusted for Inflation

Using the CPI to adjust for inflation, suction dredge miners spent approximately $8,967 each on expenses including groceries, restaurants, camp fees and other living expenses in 2008; and $4,304 each on gas, oil, equipment maintenance and repairs to suction dredge equipment in 2008. These two expense categories combined amount to $13,271 for each permit holder.

Using the CPI to adjust for inflation, each permit holder spends approximately $8,608 on a suction dredge and related equipment.

Property Tax Collected

The County Assessors official assessment of mining claims in 6 of the 58 counties is $170,108,821. Mining claim property taxes collected in these counties in 2008 was $1,701,088.

Property tax revenue generated from mining claims was not included in the State's statistical analysis completed in 1994, though it is a matter of fact and is included in our economic impact report.

Known Economic Impacts

• A total of 3,523 suction dredge permit holders spent approximately

$8,967 on expenses including groceries, restaurants, camp fees and other living expenses in 2008, for a total of $31,590,741.

· A total of 3,523 suction dredge permit holders spent approximately $4,304 on gas, oil, equipment maintenance and repairs in 2008, for a total of $15,162,992.

· A total of 3,523 suction dredge permit holders spend approximately $8,608 on a suction dredge and related equipment every four years for a total of $7,581,496 per year.

· Six out of 58 California counties collected $1,701,088 in property taxes.

· The State of California collected $219,213 in dredge permit fees.

The known expenditures by suction dredge permit holders in 2008 amounted to approximately $56,255,530.

Additional Economic Impacts

· Gold averaged $871.86 per troy ounce in 2008. Just three troy ounces recovered per dredger in 2008 added $9.21 million to the economy.

· Commercial retail rents for manufacturers of suction dredges, such as Keene Engineering, and suppliers and retailers of mining equipment should be added.

· Payroll and property taxes for the above business sectors should be added.

· Suction dredging is regularly conducted by more than just the license holder, but in this report only the permit holder's contributions are included.

· Three of the largest small-scale mining associations are located in California, with a combined membership of over 30,000 paying members and should be added.

· The two largest trade magazines marketed toward small-scale mining are located in California, with a combined circulation of 65,000 and should be added.

· Professional service providers; including geologists, refiners, assayers and mining lawyers should be added.

· Recreational vehicles; including RV's, 4x4's, trailers, all-terrain vehicles and motorcycles should be added.

Conclusion

The 1994 Environmental Impact Report, along with additional information provided here, proves without a doubt that suction dredge miners contribute significant wealth to the economy of California.

These conservative figures demonstrate the economic impact of suction dredging at $65,465,530 million in 2008. The Additional Economic Impacts cited above obviously increases the total to well above $65.46 million.

(The report was authored by Rachel Dunn of Gold Pan California, Pat Keene of Keene Engineering, and Scott Harn of ICMJ's Prospecting and Mining Journal, with the assistance of over 100 additional businesses and individuals who provided supporting documentation.)

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June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates***.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging***" (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

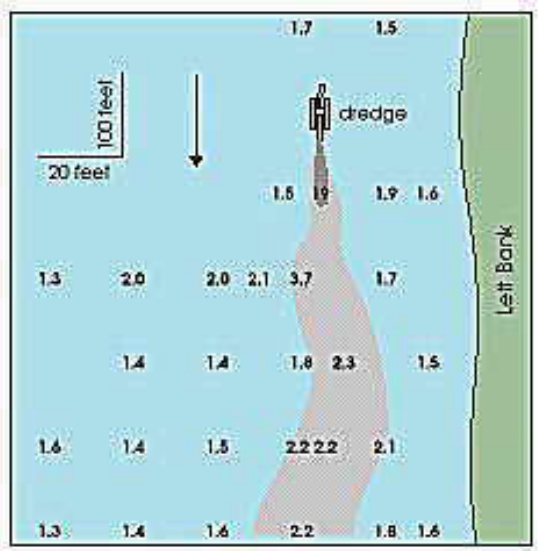

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

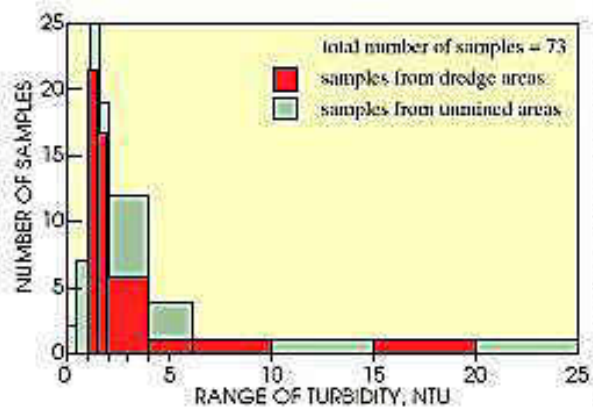

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

"Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal" (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River…. The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem… At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about *0.2 percent*. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only *0.1 percent*." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, …has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates***.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging"*** (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

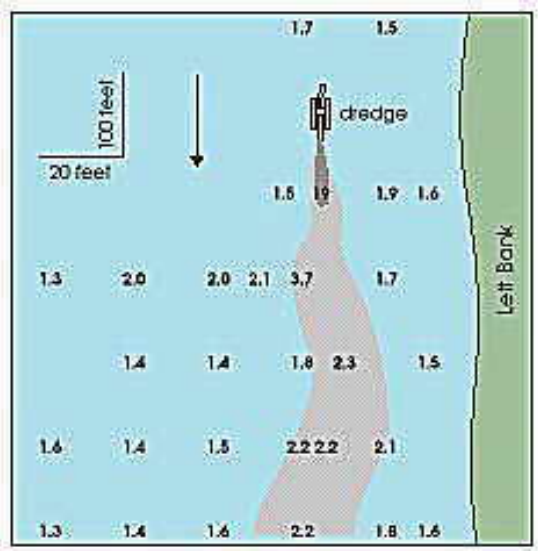

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

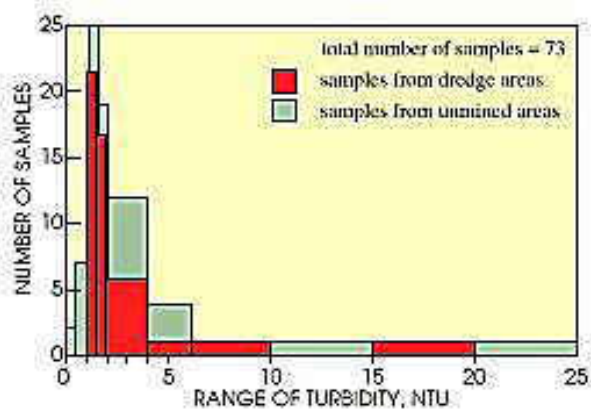

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

“Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal” (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River…. The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem… At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

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The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

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Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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California Department of Fish and Game already regulates the miners out of the waterways during important life events for the Salmon. That includes during spawning season when redds are present.

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The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

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Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and San Francisco Bay (USGS 2000).

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The Economic Impact of Suction Dredging in California

It Starts With the Statistical Analysis Completed by the State of California

An Environmental Impact Report on suction gold dredging was completed by the State of California in 1994. As part of this process, the State sent out two survey questionnaires. The first questionnaire was sent to over 4,000 individuals. Nearly 2,000 were returned completed. The surveys covered dredge locations, annual spending activity, amount invested in dredging equipment, nozzle size and related questions. The second survey was sent to county Boards of Supervisors, Chambers of Commerce and mining businesses to determine the importance of suction gold dredging on local economies. A sample of 1,257 of the individual surveys was used by the State to complete a statistical analysis.

The State of California determined, "Suction dredging is an activity that requires a substantial investment."

According to the State, each dredger spent approximately $6,250 each on expenses which included groceries, restaurants, motels, camp fees and other living expenses. In addition, they reported spending about $3,000 each on gas, oil, equipment maintenance and repairs to suction dredge equipment.

The surveys also found that each person permit holder spent an additional $6,000 to purchase a suction dredge and related equipment.

It Includes the Number of Suction Dredge Permits

According to the California Department of Fish & Game, 3,523 permits (2,966 resident and 557 non-resident) were issued in 2008. The State of California collected $126,055 in resident permit fees, and $93,158 in non-resident fees in 2008, for a total of $219,213.

Adjusted for Inflation

Using the CPI to adjust for inflation, suction dredge miners spent approximately $8,967 each on expenses including groceries, restaurants, camp fees and other living expenses in 2008; and $4,304 each on gas, oil, equipment maintenance and repairs to suction dredge equipment in 2008. These two expense categories combined amount to $13,271 for each permit holder.

Using the CPI to adjust for inflation, each permit holder spends approximately $8,608 on a suction dredge and related equipment.

Property Tax Collected

The County Assessors official assessment of mining claims in 6 of the 58 counties is $170,108,821. Mining claim property taxes collected in these counties in 2008 was $1,701,088.

Property tax revenue generated from mining claims was not included in the State's statistical analysis completed in 1994, though it is a matter of fact and is included in our economic impact report.

Known Economic Impacts

- A total of 3,523 suction dredge permit holders spent approximately $8,967 on expenses including groceries, restaurants, camp fees and other living expenses in 2008, for a total of $31,590,741.
- A total of 3,523 suction dredge permit holders spent approximately $4,304 on gas, oil, equipment maintenance and repairs in 2008, for a total of $15,162,992.
- A total of 3,523 suction dredge permit holders spend approximately $8,608 on a suction dredge and related equipment every four years for a total of $7,581,496 per year.
- Six out of 58 California counties collected $1,701,088 in property taxes.
- The State of California collected $219,213 in dredge permit fees.

The known expenditures by suction dredge permit holders in 2008 amounted to approximately $56,255,530.

Additional Economic Impacts

- Gold averaged $871.86 per troy ounce in 2008. Just three troy ounces recovered per dredger in 2008 added $9.21 million to the economy.
- Commercial retail rents for manufacturers of suction dredges, such as Keene Engineering, and suppliers and retailers of mining equipment should be added.
- Payroll and property taxes for the above business sectors should be added.
- Suction dredging is regularly conducted by more than just the license holder, but in this report only the permit holder's contributions are included.
- Three of the largest small-scale mining associations are located in California, with a combined membership of over 30,000 paying members and should be added.
- The two largest trade magazines marketed toward small-scale mining are located in California, with a combined circulation of 65,000 and should be added.
- Professional service providers; including geologists, refiners, assayers and mining lawyers should be added.
- Recreational vehicles; including RV's, 4x4's, trailers, all-terrain vehicles and motorcycles should be added.

Conclusion

The 1994 Environmental Impact Report, along with additional information provided here, proves without a doubt that suction dredge miners contribute significant wealth to the economy of California.

These conservative figures demonstrate the economic impact of suction dredging at $65,465,530 million in 2008. The Additional Economic Impacts cited above obviously increase the total well above the $60 million assertion.

(*The report was authored by Rachel Dunn of Gold Pan California, Pat Keene of Keene Engineering, and Scott Harn of ICMJ's Prospecting and Mining Journal, with the assistance of over 100 additional businesses and individuals who provided supporting documentation.*)

Karuk Tribe • Yurok Tribe • Klamath Riverkeeper • Pacific Coast Federation of Fishermen's Associations • Institute for Fisheries Resources • Center for Biological Diversity • California Trout • American Whitewater • Friends of the River • Environmental Law Foundation • Friends of Trinity River • The Butte Environmental Council • Northern California Council, Federation of Fly Fishers • The Sierra Fund • California Tribal Business Alliance • California Association of Tribal Governments • Environmental Justice Coalition for Water • Klamath-Siskiyou Wildlands Center • Rogue Riverkeeper • Environmental Protection and Information Center • Northcoast Environmental Center • California Sportfishing Protection Alliance

December 3, 2009

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

The Commenters who worked collaboratively on this document appreciate the opportunity to submit these written comments. We look forward to working with the Department to revise suction dredge mining rules in order to ensure that the activity has no deleterious affect on fish and wildlife and meets all applicable laws.

These comments should be considered as additions to comments submitted by the Karuk Tribe and others in response to the October, 2007 Public Notice by the Department (submitted on December 17, 2007) and comments submitted by the Karuk Tribe and others to the State Water Resources Control Board in June 2007 regarding suction dredge impacts on water quality.

These comments are submitted on behalf of the following groups and governments: Karuk Tribe, Yurok Tribe, Klamath Riverkeeper, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources , Center for Biological Diversity, California Trout, Friends of the River, Environmental Law Foundation, Friends of Trinity River, The Butte Environmental Council, California Associations of Tribal Governments, Northern California Council of the Federation of Fly Fishers, The Sierra Fund, California Tribal Business Alliance, Environmental Justice Coalition for Water, American Whitewater, Klamath-Siskiyou Wildlands Center, Environmental Protection Information Center, Northcoast Environmental Center, Rogue Riverkeeper, and California Sportfishing Protection Alliance.

Sincerely,

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I. BACKGROUND

California's native fish and wildlife populations are in steep decline and the majority of the state's waterways are suffering from poor water quality. The factors contributing to these declines are varied and range from activities such as urban development, irresponsible resource extraction practices, agricultural operations, global warming, and more.

Declines in fish and wildlife populations and impairments to water quality have a broad range of negative impacts to Californians' quality of life. For example, all Californians are dependant on naturally clean waterways for fisheries, recreation, and affordable drinking water. For others, declines in commercially valuable fish stocks have led to fisheries closures and concomitant losses in jobs and associated economic hardships. For others, the loss of a particular species of plant or animal and degradation of water quality in specific waterways affect religious and spiritual practices or otherwise affect cultural traditions. The latter is particularly true of California's Indigenous Tribes.

Indeed, many activities contribute to the aforementioned negative impacts to the environment, economy, and culture of Californians for many diverse walks of life. Many local, state, and federal laws are designed to evaluate many of these factors individually and establish rules and regulations as appropriate.

The current process governing the revision of rules regulating suction dredge mining dates back to a 2005 complaint filed by the Karuk Tribe against the Department. The Department's failure to act on a court order to revise suction dredge rules pursuant to CEQA and applicable provisions of the Fish and Game Code in a timely manner led the Karuk Tribe to collaborate with others including the Pacific Coast Federation of Fishermen's Associations, Klamath Riverkeeper, the Sierra Fund, Friends of the North Fork, Friends of the River, California Trout, the California Tribal Business Alliance and more to support legislation resulting in a statewide moratorium on suction dredge mining until the court order was fulfilled (SB 670, Wiggins).

II. COMMENTS

COMMENT # 1: THE DEPARTMENT MUST ASSURE THAT AN APPROPRIATE CEQA ANALYSIS OCCURS WHEN ISSUING PERMITS

Reasoning

The stated intent of the Initial Study is to develop suction dredge mining regulations that comply with the 2006 Order and Consent Judgment (*Karuk Tribe v. California Department of Fish and Game,* Alameda Superior Court, Case No. 05211597, dated December 20, 2006) and Fish and Game Code §§5653(b) and 5653.9. The commenters unequivocally contend that compliance with Fish and Game Code §§5653, 5653.9 and CEQA require two discretionary acts: (1) the adoption of regulations that comply with CEQA and the APA, and (2) a determination upon the issuance of each permit that the permitted activity will not cause deleterious impacts to fish.

In addition to amending the regulations for the suction dredge mining program pursuant to Fish and Game Code sections 5653 and 5653.9, the Department must assure that the future issuance of suction dredge permits complies with individual CEQA review. The SEIR and regulations must be explicit in requiring CEQA review for each individual permit issued under the new regulations for the suction dredge mining program.

As recognized by the legislature and the courts, each individual permit issued by the Department is subject to independent CEQA review and must be analyzed independently due to the unique circumstances that surround each permit. The Supreme Court has repeatedly held that CEQA must be interpreted to "afford the fullest possible protection to the environment.[1]" In order to carry out that objective CEQA applies to all "discretionary projects proposed to be carried out or approved by public agencies.[2]"

The issuance of individual suction dredge permits constitutes a project requiring review under CEQA. "CEQA defines a 'project' extremely broadly.[3]" The issuance of a permit by the Department to conduct mining operations in jurisdictional waterways that results in potentially significant environmental impacts falls within CEQA's statutory purview. Importantly, the legislature has specifically recognized that individual suction dredge permits are subject to CEQA.[4]

The Department's issuance of a suction dredge permit is a discretionary act. A discretionary action is one that "requires the exercise of judgment or deliberation" on the part of a public agency in deciding whether "to approve or disapprove a particular activity."[5] In determining whether to issue a suction dredge mining permit the Department must make an individual determination on permit applications that "the operation will not be deleterious to fish."[6] In ruling on the Department's decision making under Fish and Game Code § 5653, the Alameda County Superior Court found:

> "...that issuance of a suction dredge permit without a discretionary determination that the operation proposed by the license applicant is not deleterious to fish is a direct violation of the duty imposed on the DFG."[7]

Thus, each permit requires the Department's discretion. This requirement is independent from the requirement to issue regulations under Fish and Game Code § 5653.9 and assures that the regulations implementing the program comply with CEQA.

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[1] *Wildlife Alive v. Chickering*, 18 Cal. 3d 190, 206 (1976)

[2] Pub. Res. Code § 21080(a).

[3] *Azusa Land Reclamation Co. v. State of California*, 52 Cal. App 3d 415, 434 (1988).

[4] Fish and Game Code § 5653.1(a), "The issuance of permits to operate vacuum or suction dredge equipment is a project pursuant to the California Environmental Quality Act."

[5] CEQA Guidelines § 15357.

[6] Fish and Game Code § 5653(b).

[7] Order Granting Plaintiff's Preliminary Injunction, *Hillman v. Department of Fish and Game*, Alameda County Superior Court, Case No. 09434444 at 10 (July 10, 2009).

The courts have further determined that the issuance of individual suction dredge permits is an independent discretionary project triggering CEQA. Looking specifically at whether the Department was violating CEQA in issuing suction dredge permits the Honorable Frank Roesch found that:

> "...each permit granted by the DFG involves a discretionary approval triggering a CEQA review. The DFG must exercise its discretion each time it issues a suction dredge permit"[7]

Moreover, the unique factual circumstances of each suction dredge mining application and permit require an independent review of the environmental effects of issuing the permit. Each permit constitutes a different set of site specific conditions involving, but not limited to, differences in ecology, biology, hydrology, water quality, and geology. The range of suction dredges with varying levels of impacts requires a unique analysis of each dredge's potential to cause environmental impacts.[8] Also, the extent, duration, and variability of the suction dredge activity will vary by permit and individual and must be considered. A weekend miner, who only deploys his dredge over a limited time period, will have a different impact than a full-time miner who runs a dredge over a long period.

Within this complex factual environment the Department must make an individualized showing that the permit will not have deleterious effects on fish.[9] As the legislature and courts have made clear this determination must be made in concert with the CEQA process for each permit.

Recommendation

The Amended Regulations and EIR must make clear that each individual permit is subject to separate CEQA review in order to analyze the potentially significant impacts o the Department's issuance of a permit and to assure that "the operation will not be deleterious to fish."

COMMENT # 2: THE SCOPE OF THE REVIEW SHOULD FOCUS ON WHICH RIVER SEGMENTS THE DEPARTMENT CAN AFFIRMATIVELY PROVE THAT ANY SUCTION DREDGE MINING WILL NOT CAUSE DELETERIOUS IMPACTS TO FISH.

Reasoning

As stated above, the Commenters contend that the Department must review each individual permit to determine that the permit applicant's suction dredge mining operation will not cause deleterious impacts to fish. However, from the Department's description of its obligations in the Initial Study, it appears the Department is taking the position that the adoption of new regulations is the only discretionary act required under the Fish and Game Code and CEQA.

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[8] Initial Study, pps 12-16.

[9] Fish and Game Code § 5653(b).

While the Commenters do not sanction the Department's interpretation of its duties, we suggest the following alternative approach because we believe it could provide an equivalent level of protection to California's rivers and wildlife that was intended when the Legislature amended the Fish and Game suction dredge mining statutes in the early 1990s.

Commenters believe that the permitting program should be limited to include only those rivers in which the Department can affirmatively prove that no deleterious impacts will occur to fish. This position is consistent with the baseline established by the Department for the review; specifically that it "is one that assumes no suction dredging in California."[10] Commenters are pleased that the Department adopted this baseline and agree that it is appropriate.

Under the approach, a river segment would not be allowed to be dredged if, after the Department considers the body of literature and any other evidence, it finds either: (1) that suction dredge mining would result in negative impacts to fish and their habitat, (2) the evidence fails to conclusively determine that no negative impacts would occur, yet suggests such impacts are likely or possible; or (3) there simply is a lack of evidence or other data regarding a particular river segment.

The Department would not be allowed to make a determination that suction dredge mining would be allowed on large sections of rivers, particularly where no studies have been conducted or no other evidence exists to definitively establish a no deleterious impact result.

Recommendation:

As an initial matter, Commenters believe the following rivers should be excluded from the suction dredge mining program because dredging is particularly likely to result in deleterious effects:

1. All river segments with historical gold mining activities in which mercury was utilized;

2. River segments listed as impaired under 303(d) of the Clean Water Act due to turbidity, water temperature, sediment, or mercury;

3. All river or stream segments designated as components of the National Wild and Scenic Rivers System or deemed eligible for protection by federal agencies. Federal rivers are to be managed to protect their specific outstandingly remarkable scenic, recreation, historical/cultural, fish/wildlife, ecological, geological, and other values. In addition, water quality on federally protected rivers must meet or exceed federal criteria or federally approved state standards for aesthetics, fish and wildlife propagation, and primary contact recreation[11]

[10] Initial Study, p. 22.

[11] Public Resources Code, Chapter 1.4 (commencing with Section 5093.50) of Division 5.

(Commenters note that the Initial Study contains an incomplete list of State and Federal Wild and Scenic Rivers on page 7);

4. All rivers protected pursuant to provisions of the California Wild and Scenic Rivers Act (Chapter 1.4 (commencing with Section 5093.50) of Division 5 of the Public Resources Code). DFG has a responsibility in its permitting process to protect the free flowing character and extraordinary values of state designated rivers;[12]

5. All river or stream segments designated by the Fish and Game Commission as Wild Trout Waters or Heritage Trout Waters, or deemed suitable for designation pursuant to Section 1727 of the Fish and Game Code;

6. All river segments that provide critical, potential, and historical habitat for federally or state listed threatened species or endangered species, "Special Animals" (e.g. species at risk, special status species, species of special concern) and candidate/proposed species;

7. Rivers in Key Watersheds as identified by the Northwest Forest Plan;

8. All stretches of rivers in which miners' off-river activities (hauling supplies, camping, taking dredges on or off river, refueling, emptying sluices, sorting concentrates, etc.) will likely cause negative impacts to the immediate environment because it results in activities such as trampling of sensitive or culturally significant plants, fuel spillages, or handling of hazardous materials.

In addition, the Department's regulations must clearly state that the Department has the right to revoke, suspend, or refuse to be renew a permit should it discovery evidence showing that deleterious impacts will occur to fish.

Lastly, since the CEQA review includes a review of water quality issues (and, particularly because the State Water Board is likely to use the findings for its own permitting program), Commenters believe that the Department should conduct an anti-degradation analysis. This would require a river-by-river analysis of the baseline water quality, a study of the impacts from suction dredge mining, and the requisite analysis to determine whether any degradation will occur to water quality from suction dredging activity. If the answer is in the affirmative, suction dredge mining cannot be allowed. The point of this analysis is determine *beforehand* whether suction dredging in a particular area will degrade water quality – rather than have it occur and try to fix it later. (*See, also,* Comments #4 and #5 below.)

COMMENT # 3: THE INITIAL PLAN FAILS TO DESCRIBE HOW THE DEPARTMENT WILL LIMIT THE SUCTION DREDGE PROGRAM BASED ON FINANCIAL CONSTRAINTS ON ENFORCEMENT AND MANAGEMENT

Reasoning

[12] Public Resources Code Section 5093.61.

The Department should limit the scope of its suction dredge program on the basis of what its finances allow under the current fee structure. In other words, it should limit the program to what it can honestly and pragmatically enforce and manage. If the Department only has the means to monitor the impacts of suction dredge mining on a limited number of river segments and streams throughout the state, then it must limit the river segments and streams in which it allows suction dredge mining to occur. This is the only approach allowable in order for the Department to be able to conclude that each operation will not cause deleterious impacts to fish.

Recommendation

The SEIR should provide an economic analysis and policy proposal based on what river segments the Department can afford to adequately manage and enforce regulations.

COMMENT #4: THE EIR MUST COMPLY WITH THE DEPARTMENT'S DUTY UNDER CEQA TO INFORM THE PUBLIC OF HOW THE REVIEW WILL NOT CONFLICT WITH EXISTING LAWS AND THE FACILITATION OF OTHER PERMITTING PROGRAMS

Reasoning

The EIR must fully disclose and analyze the Project's potential conflicts with existing laws and regulatory programs. An EIR is required to be an informational document from which the public can properly weigh any adverse effects presented by a project.[13] .In conducting this analysis, the agency "must use its best efforts to find out and disclose all that it reasonably can" and cannot simply hide behind its failure to gather and analyze the necessary information.[14]

Recommendation

A key component of the informational requirements of CEQA is the full disclosure and analysis of conflicts with other environmental laws. Indeed, CEQA requires the EIR to analyze whether the Project will "[v]iolate any water quality standards or waste discharge requirements."[15] These standards promulgated under the Clean Water Act and administered by the State Water Quality Control Board are crucial for a determination of the Project's impacts on hydrology and water quality. To that end the EIR must analyze any potential conflicts with the achievement of Clean Water Act standards under §§ 303(d), 401, 402; the Porter-Cologne Act, and any other relevant provisions of applicable law such as the California Endangered Species Act and the national Endangered Species Act.

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[13] Pub. Res. Code §§ 21061; 21005(a) states that, "noncompliance with the information disclosure provisions of this division which precludes relevant information from being presented" violates CEQA.

[14] Guidelines § 15144.

[15] Appendix G § VIII, relied upon in the Initial Study at p. 70.

COMMENT # 5: THE INITIAL STUDY IS NOT CLEAR AS TO WHAT LEGAL AUTHORITIES ARE APPLICABLE.

Reasoning

On page 4 of the Initial Study one stated program objective is to:
"Promulgate regulations as necessary that effectively implement Fish and Game Code section 5653 and 5653.9 and other applicable legal authorities."

The Commenters assert that "other applicable legal authorities" must include compliance with the Clean Water Act and any additional applicable laws typically enforced by the California State Water Resources Control Board (Water Board) such as the Porter-Cologne Act. According to the Water Board:

"The Water Boards are currently working with the CDFG to include water quality protection measures in its regulatory program."[16]

Furthermore, it is the understanding of the Commenters that this SEIR is partially funded by the State Water Quality Control Board so that the Board can use its findings to determine whether the resulting DFG regulations satisfy the various water quality statutes enforced by the Board.

In addition, the Program Objectives fail to reflect the Department's obligation to comply with Fish and Game Code Section 1600 regarding Streambed Alteration Agreements. As noted by the Friends of the North Fork, the Department's failure to require suction dredge permittees to comply with the state's Streambed Alteration Agreement statutes violates the courts' long-standing presumption against "implied repeals."[17] The courts have regularly and consistently stated that all laws on a similar subject must be given full force and effect, unless it is impossible to rationally do so. The state's laws regarding suction dredging and streambed alteration agreements are not so fundamentally incompatible that one must be preempted by the other.

Recommendation

The SEIR should specifically describe how the project will comply with the Clean Water Act and all rules and regulations of the Water Board as well as those of Cal EPA. These agencies should be listed as additional legal authorities for the purposes of this rule making process. In addition, Cal EPA should be added to the list of "Other Public Agencies whose Approval or Input May be needed."[18]

Furthermore, the program objectives should include compliance with Fish and Game Code Section 1600 regarding Streambed Alteration Agreements as well as the California Endangered Species Act and the national Endangered Species Act.

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[16] http://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/suctiondredge/2008_faq.pdf

[17] Letter to Department Director Ryan Brodderick from Friends of the North Fork, June 21, 2007.

[18] Initial Study, p. 28.

COMMENT # 6: DESCRIPTION OF UPDATED REGULATIONS DOES NOT ADEQUATELY EVALUATE THE FULL RANGE OF ACTIVITIES TO WHICH NEW REGULATIONS MAY APPLY.

Reasoning

The Initial Study provides a list of activities not considered suction dredging for purposes of the Proposed Program, as they are not subject to the Department's permitting authority under Fish and Game Code section 5653, subdivision (b). These activities include high banking outside of the existing water line; use of a suction dredge with its intake pipe removed but still using a pump to move water through the sluice box; and power sluicing for gold.[19]

The initial study adopts these existing exclusions with no consideration of the in-stream impact of these activities and with no analysis of whether or not these activities meet the definition of suction dredging as defined by Fish and Game Code Section 5653 or California Code of Regulations Section 228. Indeed, California Code of Regulations Section 228 states:

> *"For purposes of these regulations, suction dredging (also called vacuum dredging) is defined as the use of a suction system to remove and return material at the bottom of a stream, river, or lake for the extraction of minerals."*

The Commenters note that this definition does not define suction dredges as having gas or diesel powered vacuum pumps or motors or any particular type. Commenters therefore assert that many of the activities listed on page 5 of the Initial Study may meet this definition. After all, many of these activities involve sucking up the river bottom and there is nothing in the statute that justifies the narrow definition assumed in the Initial Study.

Nor does CCR 14 Section 228 define a suction dredge by specifying any particular type of pump technology or vacuum system design. The Initial Study, however, limits the definition of a suction dredge to those devices utilizing a vacuum hose operating through the Venturi effect. [20] The Initial Study's definition is erroneously inconsistent and narrower than that of Section 228's superseding definition. By requiring a Venturi jet in order to be considered a suction dredge pursuant to the regulations, the Department is creating an incentive to switch to a different type of pump jet to avoid regulation.

The SEIR must also fully disclose and analyze the reasonably foreseeable direct and indirect environmental effects of the activities associated with suction dredge mining. CEQA requires that the Department analyze "the whole of an action" directly undertaken, supported, or authorized by a public agency "which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment."[21] As noted above, and in the Initial Study at 17-20, there is a range of

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[19] Initial Study, pps. 6-7.

[20] Initial Study, p. 5.

[21] Pub. Res. Code § 21065; CEQA Guidelines § 15378(a).

reasonably foreseeable activities that result from suction dredge mining that have potentially significant environmental effects.

Recommendation

The SEIR should consider and evaluate the entire range of activities and technologies that meet the definition of suction dredging under California Code of Regulations Section 228 that should be governed by the new regulations. The SEIR must also fully disclose and analyze the reasonably foreseeable direct and indirect environmental effects of the activities associated with suction dredge mining.

COMMENT # 7: THE INITIAL STUDY INAPPROPRIATELY DEFINES "DELETERIOUS EFFECT."

Reasoning

The Initial Study defines 'deleterious effect' as follows:

> *"...the Department is guided by a common sense plain meaning of the word deleterious such that deleterious effect generally means a wide-ranging or long-lasting consequence for a fish population that extends beyond the temporal or special context of a specific direct impact. Such deleterious effects could include the following: (1) Catch, capture, kill, or injure a species listed as candidate, threatened or endangered under the state or federal Endangered Species Act; (2) A substantial reduction in the range of any species, and/or extirpation of a population; (3) A fundamental change to the structure of a community or stream ecosystem, including substantial reductions in biodiversity or resiliency to disturbance, resulting in the reasonably foreseeable consequence of (1) or (2) above."*[22]

Commenters contend that the Department's definition of "deleterious" is not based on 'common sense' as it purports. It should be noted that the statute does not define 'deleterious'. Therefore, basic cannons of statutory interpretation require the Department to adopt the common, lay definition – such as that found in the dictionary. The very high standard referenced in the Initial Study is not supported by the statute, case law, or common usage.

Webster's Dictionary defines deleterious as *harmful often in a subtle or unexpected way.*[23]

Recommendation

Adopt a definition for phrase 'deleterious effect' that is consistent with the legally acceptable definition of the word 'deleterious.'

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[22] Initial Study, pps. 7-8.

[23] http://www.merriam-webster.com/dictionary/deleterious

COMMENT # 8: DREDGING IMPACTS ON FISH'S ACCESS TO COLD WATER REFUGIAL AREAS JUSTIFIES A COMPLETE BAN ON DREDGING IN THESE AREAS

Reasoning

In many salmonid bearing streams, migrating fish, both out-migrating juveniles and returning adults, rely heavily on thermal refugia to survive. Thermal refugia are river zones characterized by water temperatures measurably lower than the main channel or surrounding area. The lower temperature of the refugial area results from inflow from a colder tributary or an underwater spring.

Given that these areas are of monumental importance for fish survival (both juveniles and adults), we urge a very thorough analysis and river by river identification of thermal refugia. For a recent evaluation of the importance of thermal refugia in the Klamath system and a brief preliminary analysis of dredging impacts of such areas, please see Chapter 4 of the North-coast Regional Water Quality Control Board's Staff *Report for the Klamath River Total Maximum Daily Loads (TMDLs) and Action Plan Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California.*[24]

Recommendation

The SEIS should thoroughly characterize the location of thermal refugia in each river where dredging occurs and disallow dredge mining in these zones and adjacent buffer zones. Many thermal refugial areas and associated buffer zones have been documented in various Biological Opinions and TMDLs. This evaluation could be included in the section with the heading 'Effects from Habitat Alteration' on page 46 as well as 'Impacts on Juveniles and Adults' subheading 'Behavioral effects' page 41.

COMMENT # 9: THE HYDROLOGY AND WATER QUALITY SECTION FAILS TO ADEQUATELY ADDRESS THE MANY HAZARDS ASSOCIATED WITH MERCURY AND SUCTION DREDGE MINING

Reasoning

Under the Clean Water Act, states adopt water quality standards for their rivers, streams, lakes, and wetlands. These standards identify levels for pollutants, including mercury, which must be met in order to protect human health, fish, and wildlife. No person may discharge pollutants, including mercury, into waters unless the person has a permit.

The National Pollutant Discharge Elimination System (NPDES) is the permit system established by the Clean Water Act (CWA) to regulate direct wastewater discharges from wastewater treatment plants and industry. Wastewater dischargers may be required to comply with a specific mercury discharge limit (concentration and/or mass limit) or may only be required to monitor their discharges for mercury. Local discharge limits in California for mercury range from 0 to 0.1 ppm (or mg/l). The Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a water body can receive

[24] http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/, particularly Chapter 4.

and still meet water quality standards. TMDLs determine what level of pollutant load would be consistent with meeting water quality standards. The TMDL regulatory process also allocates acceptable loads among sources of the relevant pollutant.

A single recreational such dredge operating at 8 hours per days for 30 days disturbing 1-10sq/meters of stream bed in an area with a background concentration of mercury in the stream bed of 30ppb-1ppm would be responsible for mobilizing more mercury than the amount of mercury mobilized over the course of an entire year for an entire watershed. NPDES permits have not been given to recreational suction dredgers nor have TMDL's been developed for the waterways in which recreation suction dredging currently takes place in California. As such, recreational suction dredging in areas with mercury contamination is likely in violation of the Clean Water Act.

Recreational suction dredging exacerbates the existing mercury contamination problems in water bodies and increase the levels of mercury contamination in fish:

- **Recreational suction dredging takes place during the warm summer months of heightened biological activity**. Recreational suction dredges disturb and release mercury primarily in the summer months when the water is warm and the flows are low and there are an abundance of bacteria rich environments where mercury methylation is likely to occur. Once mercury gets into fish it can result in impaired water body listings or 303d listings, and fish consumption advisories. There are numerous fish consumption advisories for fish in mercury impaired water bodies in the Sierra as a result of mercury contamination. [25]

- **Floured mercury is released back into the water body.** The project description of recreational suction dredging acknowledges the fact that miners encounter mercury when operating dredges and begs the question about the mercury that is not captured by the dredge but is instead floured by the dredge and re-released back into the water-body in a form that is more likely to methylate and be incorporated into the food chain.[26] The floured mercury that is released back into the water body has been changed by the dredging activity and is considered more likely to methylate because as it travels through the intake hose, educator, and header box the mercury is disturbed and broken up into very small pieces. These small pieces, or floured mercury, are readily available to bacteria because it is small (high surface area to volume ratio), oxygenated and dispersed.

- **Mercury travels downstream.** The mercury that is not captured by the dredge but is instead discharged into the water-body travels downstream through any number of varied and divers habitats where it can be taken up by bacteria that live on the banks of the river and form floodplain wetland environments. The floodplain environment of upland rivers includes the entire 100 year floodplain because this is the area that gets inundated by storm events when the rivers swell and overtop the banks. It follows that, as long as the dredge is operating within

[25] OEHHA, 2009 2009 Update of California Sport Fishing Advisories. http://oehha.ca.gov/fish/so_cal/index.html.

[26] Humphreys, R. 2005, RWQCB Staff Report, Mercury Losses and Recovery During a Suction Dredge Test in the South Fork of the American River.

the 100 year floodplain the dredge effluent that contains mercury is likely to contaminate the aquatic food chain. The literature review states that:

"Dissolved Hg, floured liquid Hg, and fine particle/colloid bound Hg may be transported long distances to environments favorable to methylation, e.g. wetlands, Yolo Bypass, or the Delta. It is well-known that methylation occurs in these environments."[27]

It is important to note that mercury may not need to travel long distances to be methylated, in fact methylation is likely to occur in the hyphoric zone, in backwater channels and as benthic exchange in many carbon rich low oxygen environments. The different environments, times of year and extent of mercury methylation has not been studied, nor has the effect of recreational suction dredging on methylation in these different environments occurred. Until the areas with the greatest mercury contamination and methylation potential are known it is prudent to not operate recreational suction dredges, otherwise the mercury contamination problem in California may worsen.

Recommendation: The effect of recreational suction dredging to water quality should be considered first and foremost among the impacts of the project. The impacts of disturbing and re-distributing mercury in the environment, on water quality, wildlife and human health and fish populations need to be fully analyzed in the SEIR.

COMMENT # 10: THE SEIR SHOULD PROPOSE A MANDATORY PROTOCOL FOR THE TRANSPORT, USE, AND DISPOSAL OF HAZARDOUS MATERIALS INCLUDING BUT NOT LIMITED TO MERCURY, NITRIC ACID, GASOLINE, AND DIESEL FUEL.

Reasoning

Page 19 of the Initial Plan describes the process by which gold can be extracted from ore using mercury and nitric acid. Additionally, the Initial Plan describes the need for miners to refuel mechanized dredges and change the oil.

All of the chemicals used in these activities are hazardous, some such as mercury, dramatically hazardous.

Recommendation

The SEIR should propose a mandatory protocol miners must adhere to when transporting, using, dispensing, or disposing toxic chemicals. The Commenters urge the Department to ban the use of mercury and nitric acid in mining camps and instead require that the extraction of gold from ore be done off site in a controlled environment.

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[27] Churchill, R. K. (2000). Contributions of Mercury to California's Environment from Mercury and Gold Mining Activities–Insights from the Historical Record. Extended abstracts for the U.S. EPA-sponsored meeting, Assessing and Managing Mercury from Historic and Current Mining.

COMMENT # 11: RULES REGULATING DREDGE MINING SHOULD CONSIDER RISKS TO MINERS' HEALTH WHEN DREDGING DURING TOXIC ALGAE BLOOMS

Reasoning

In water bodies throughout California, blooms of toxic blue green algae constitute a potent public health risk. In response to the threat, the California State Water Resources Control Board has organized a Blue Green Algae working group to develop guidelines and recommendations *"to provide guidance to local, state, and tribal regulators to protect people, pets, and livestock from the effects of toxic cyanobacteria in non-marine water bodies."*[28]

On the Klamath in particular, blooms of the blue green algae *Microcystis aeruginosa* has led to intensive monitoring for the algae and its associated toxin, microcystin. Microcystin is a potent liver toxin. According to the Blue Green Algae Working Group's Voluntary Guidance Document:

> *"Exposure to microcystins has the potential to cause acute and chronic injury, depending on the dose and duration of exposure. Sub-acute damage to the liver is likely to go unnoticed up to levels that are near severe acute damage (Chorus et al., 2000). Two aspects of chronic damage include progressive injury to the liver and tumor-promoting capacity. The International Agency for Research on Cancer found there was inadequate evidence for carcinogenicity of microcystin LR or Microcystis extracts (WHO, 2006). However like several other liver toxins, microcystins have been shown to promote liver tumors (Falconer & Buckley, 1989)."*[4]

Dredge miners spend hours in the Klamath and other rivers in the summer when algae blooms are at their peak and hours more in camp wearing damp wet suits. This means that as a user group, miners are extremely susceptible to the negative health affects of algal toxins.

Recommendation

In order to protect the health of miners, the Commenters urge the Department to evaluate the unique risks that toxic algae blooms pose to miners' health and consider steps to discourage or limit dredging when algal toxin concentrations exceed guidelines developed by the Blue Green Algae working group.

COMMENT # 12: THE SEIR SHOULD INCLUDE A SECTION ON ENVIRONMENTAL JUSTICE

Reasoning

[28] http://www.waterboards.ca.gov/water_issues/programs/bluegreen_algae/docs/bga_volguidance.pdf

Several California laws require that state agencies, and California EPA in particular, to consider how rules and regulations affect minority communities. These laws include SB 828, AB 1360, SB 89, and more.

Environmental justice (EJ) is defined in California law as *"the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies."*[29]

Indeed, Public Resources Code sections 71110-71113 charges Cal/EPA with the mandate to conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures the fair treatment of people of all races, cultures, and income levels, including minority populations and low-income populations of the state.[30]

Commenters have already asserted that the California Water Board and Cal EPA should be included as legal authorities for the purposes of this rule making process due in large part to the intrinsic connection the practice of suction dredging has on water quality.

The Karuk Tribe has described the cultural beneficial uses of the Klamath River. These uses are described and documented in some detail in Chapter 2 of the North-coast Regional Water Quality Control Board's *Staff Report for the Klamath River Total Maximum Daily Loads (TMDLs) and Action Plan Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California.*[31]

Recommendation

Commenters urge the Department to thoroughly describe the impacts suction dredging has on the cultural beneficial uses of the Klamath River as identified by the Karuk Tribe as well as the cultural beneficial uses identified by other Indian Tribes and affected communities in other watersheds. Note that these affected beneficial uses pertain not only to anadromous fish, but to mussels, various riparian plants, mollusks, and more. In general, the SEIR should fully evaluate whether the proposed actions are consistent with California's stated commit to the principles of environmental justice.

COMMENT # 13: PUBLIC MEETINGS SHOULD BE HELD IN AREAS THAT ENCOURAGE PARTICIPATION BY AFFECTED PARTIES THAT HAVE DIFFICULTY TRAVELLING LONG DISTANCES DUE TO ECONOMIC HARDSHIP

Reasoning

As noted previously, the Karuk Tribe is one of the key parties forcing a re-evaluation of suction dredge rules and the Tribe asserts that it is one of the parties suffering most from the adverse impacts of suction dredging. In addition, it should be recognized that Karuk

[29] Government Code section 65040.12

[30] http://www.calepa.ca.gov/EnvJustice/Documents/2004/Strategy/Final.pdf

[31] http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/090619/Ch_2_PS_090619.pdf

Tribal members most reliant on the described cultural beneficial uses of the Klamath River experience poverty rates of 90%.[32]

The closest scoping meeting to Orleans, the town nearest the Karuk Tribe's dip net fishery, was in Redding California over 3 hours drive away and in the evening. This means that overnight accommodations were necessary in order to attend.

Recommendation

Hold a public comment meeting on the draft SEIS in Orleans in order to allow a relevant, but economically disadvantaged community to participate in the public process. Hold public meetings in coastal fishing communities such as Eureka to allow commercial fishing families to attend.

COMMENT # 14: THE ODOR EMITTED FROM SUCTION DREDGES SHOULD BE CONSIDERED A 'POTENTIALLY SIGNIFICANT IMPACT.'

Reasoning

One of the most common complaints Commenters receive from the local public regarding suction dredges concerns the odor and fumes emitted. In small rural river communities, summer means hot afternoons spent beside a favorite swimming hole. Nothing ruins the experience quite like the noise and fumes produced by a dredge. The Commenters assert that this is likely an experience shared by recreational river users statewide whether they are swimmers, boaters, or hikers.

For Tribes, many areas and river reaches utilized by dredge miners are also near prayer spots and ceremonial grounds. The fumes and noise generated by dredges therefore infringe on Tribal members' ability to freely and meaningfully engage in religious and cultural practices.

Recommendation

In the Air Quality section, page 34, consider 'create objectionable odors affecting a substantial number of people" to be a 'Potentially Significant Impact.'

COMMENT # 15: NOISE AND CHEMICAL IMPACTS TO JUVENILE SALMON SHOULD BE THOROUGLY EVALUATED

Rationale

The Initial Plan fails to include an evaluation of the impacts to juvenile salmonids by: (1) petroleum fuel spillage into the river from dredging engines; and (2) noise pollution from these engines and the impacts of this noise on the homing and tracking as well as predator avoidance and other survival traits of juvenile salmonids in the water near these in-river dredge operations. Noise alone, being a violent vibration of water in this case for long periods of time, can adversely affect the highly sensitive sound-receptive membranes of

[32] http://karuk.us/press/2005/Health%20Effects%20of%20Altered%20Diet.pdf (see page 36).

juvenile salmonids in many ways, potentially undermining their ability to hear and avoid predators and thus reducing their survival rates. Noise pollution and its disturbing influence on aquatic life generally is a factor that may represent a "potentially significant impact." Indeed, studies of fish response to loud underwater noises in the ocean show that noise can rupture these delicate auditory membranes, making the fish deaf to predators or the signaling from their own kind for mating. Similar deleterious affects could result from suction dredges.

Recommendation

The commenters believe that without any evidence to the contrary, suction dredge mining should not be allowed during times when juvenile salmonids are out-migrating. We note that the timing is different watershed to watershed and species to species. The scope of the EIR should include identifying all those time periods in which salmonids are likely to be present in those areas (as juveniles and spawning adults), and allowing suction dredge operations ONLY in those narrow time periods during which salmonids are least likely to be impacted due to not being present.

COMMENT # 15: A CONSIDERATION OF THE EFFECTS ON RIPARIAN HABITATS AND SENSITIVE NATURAL COMMUNITIES (PAGE 57) SHOULD THOROUGHLY CONSIDER IMPACTS TO PLANTS WITH CULTURAL AND MEDICINAL USES.

Reasoning

As noted earlier, the Karuk Tribe has provided to the Water Board a report on the cultural beneficial uses of the Klamath River and associated flora and fauna. Many plants found within the riparian zone of the Klamath River have value as basket materials or are used in traditional medicines. This is true for other watersheds and resident Tribes as well.

Recommendation

Consider the impacts suction dredging has on riparian zone plants that have been identified as having particular uses in basketry and traditional medicines.

COMMENT # 16: THE INITIAL PLAN FAILS TO ADEQUATELY ASSESS LOCAL TRAFFIC IMPACTS

Reasoning

In rural areas such as the Klamath River corridor, there are a limited number of pull outs and the shoulders of roads can be non-existent. In the summer, at the height of the tourist season, we observe groups of miners camped in these limited small pull outs along the road. The result is that locals are unable to find safe parking to access the river, and miners maneuver RV's with dredges in tow awkwardly in these turn outs which often are flanked by blind curves. The result is a dangerous traffic situation.

Recommendation

Consider under the section for Transportation/Traffic (page 87), that the project constitutes a 'Potentially Significant Impact' for subheadings (a), (d), (e), and (f).

COMMENT #17: THE INITIAL PLAN DOES NOT ADDRESS AESTHETIC IMPACTS AFTER DREDGING HAS OCCURRED

Reasoning

The Initial Study's identification of aesthetic impacts is limited to those impacts while suction dredge mining is actually taking place or while dredges are in rivers and streams. The study does not identify aesthetic impacts that exist *after* the mining activity has taken place. These include ropes and cables left attached to trees and rocks on the banks, abandoned mining equipment, trash such as discarded vacuum hoses, and the dredge holes and tailings piles in the river itself.

Recommendation

Analyze residual aesthetic impacts in the SEIR and issue regulations to reduce these impacts.

COMMENT #18: THE EFFECTS OF INCREASED TURBIDITY ON WATER TEMPERATURE ARE NOT CONSIDERED

Reasoning

Turbid water absorbs more solar radiation than clear water and, resultantly, reaches higher temperatures given the same amount of solar input. Increased turbidity can dramatically raise water temperatures on streams with relatively low flow. Suction dredge mining takes place primarily in summer during periods of the lowest annual flow on many rivers. It is reasonable to expect that increased turbidity from suction dredge mining may be artificially increasing water temperatures, negatively impacting fish that are already temperature stressed.

Recommendation

Analyze the impacts of increased turbidity on water temperature and subsequently on fisheries. Do not allow suction dredge mining on streams already experiencing temperatures stressful to fish or that are listed as temperature impaired pursuant to section 303(d) of the Clean Water Act.

COMMENT #19: CUMULATIVE IMPACTS OF THE PROGRAM MUST BE VERY THOROUGHLY EVALUATED AND CONSIDER EFFECTS OF RISING GOLD PRICES ON SUCTION DREDGING'S POPULARITY

Reasoning

The given impacts of a single dredge are multiplied when other dredges operate either concurrently or successively on a stream. The increasing price of gold is likely to result in an increase in the popularity of suction dredge mining as it did in the late 1970's and early 1980's[33]. Although the number of permitted suction dredges in the state has been relatively steady (around 3,200 annually), this must not be considered to necessarily indicate the future situation. An increased number of dredges operating on the state's rivers will magnify their cumulative impact.

Recommendation

Provide a thorough analysis of cumulative impacts through time and consider the likelihood of another spike in the popularity of suction dredging and its significance to cumulative impacts. Cap the number of dredges allowed on any given stream reach to reduce their cumulative impacts.

COMMENT # 20: THE INITIAL PLAN FAILS TO ADEQUATELY ASSESS THE IMPACT ON OTHER RECREATIONAL ACTIVITIES.

Reasoning

The environmental check list considers recreation impacts to be less than significant. It further states that since suction dredgers appear to be a "very small proportion" to total recreation use, the Proposed Program is not anticipated to impact recreational use or facilities. This reasoning ignores the fact that on some specific segments of the Klamath and East Fork San Gabriel Rivers (for example), suction dredging has become the primary use, dominating and creating significant conflict with other uses, and, in some cases, forcing other users out of the river segments.

Recommendation

Identify river and stream segments where the sheer density of suction dredging impacts and conflicts with other uses and adopt appropriate regulations to mitigate and reduce this impact to insignificant levels.

[33] Initial Study, p. 10.

KEENE ENGINEERING COMPANY INC.

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December 3, 2009

Dear Mark Stopher,

I would first like to say that I appreciate your unbiased views and hope we can work together with you and the department to get dredging open again.

As per our discussion at the Fresno scoping meeting about average yardages and capabilities of suction dredges. We have spent much time to give you realistic figures based on river conditions. These are good figures that we can all work with. I am sure if you check with any dredgers you will find that these formulas are true and correct. We made two different charts to represent both rocky type areas, such as the Yuba River and large gravel bars as found on the Klammath River. Please feel free to ca me if you have any questions.

Sincerely,

Patrick Keene

Keene Engineering

Dredge Study

Typical California type conditions. Such as River Gravel on the Klamath River

All test are based on a 1 to 1 flow ratio. Hose length not to exceed 20 feet or less material will be moved.

Dredge Size hose Diameter	Engine horse power	Water flow GPM through the Suction hose	Total water discharge through Sluice	Average % of solids in slurry	Gallons of solids per minute	Cubic feet of solids per minute	Cubic feet of solids per hour	Cubic yard of solids per hour
2 inch	2.5 hp	40	80	1.5	0.6	0.08	4.93	0.18
2.5 inch	3.5 hp	50	100	1.5	0.75	0.10	6.17	0.23
3 inch	4 hp	100	200	1.5	1.5	0.21	12.33	0.46
4 inch	6 hp	150	300	1.5	2.25	0.31	18.50	0.69
5 inch	9 hp	300	600	1.5	4.5	0.62	36.99	1.37
6 inch	14 hp	350	700	1.5	5.25	0.72	43.16	1.60
8 inch	46 hp	750	1500	1.5	11.25	1.54	92.48	3.43
10 inch	95 hp	1600	3200	1.5	24	3.29	197.28	7.31

Typical California type conditions. Such as dredging on the North fork of Yuba River

All test are based on a 1 to 1 flow ratio. Hose length not to exceed 20 feet or less material will be moved.

Dredge Size hose Diameter	Engine horse power	Water flow GPM through the Suction hose	Total water discharge through Sluice	Average % of solids in slurry	Gallons of solids per minute	Cubic feet of solids per minute	Cubic feet of solids per hour	Cubic yard of solids per hour
2 inch	2.5 hp	40	80	1	0.4	0.05	3.29	0.12
2.5 inch	3.5 hp	50	100	1	0.5	0.07	4.11	0.15
3 inch	4 hp	100	200	1	1	0.14	8.22	0.30
4 inch	6 hp	150	300	1	1.5	0.21	12.33	0.46
5 inch	9 hp	300	600	1	3	0.41	24.66	0.91
6 inch	14 hp	350	700	1	3.5	0.48	28.77	1.07
8 inch	46 hp	750	1500	1	7.5	1.03	61.65	2.28
10 inch	95 hp	1600	3200	1	16	2.19	131.52	4.87

KLAMATH RIVERKEEPER®
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November 20, 2009

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

RE: Suction Dredge SEIR Meeting in Klamath River Region & Extension of NOP Comment Period

We are writing to respectfully request that the California Department of Fish and Game hold a public meeting on the Notice of Preparation for the suction dredge Subsequent EIR in the Klamath River region. While we understand that the Department is obligated to hold only one such meeting and that three meetings have been held, it is a glaring oversight for a meeting to not be held on the Klamath.

As you know, the legal decisions that precipitated the development of the SEIR arose from suction dredge activities in the Klamath watershed. Perhaps more than anywhere else in the state, the current suction dredging issue and debate has originated on the Klamath River. We believe that this fact alone justifies the addition of a public meeting in this area.

Further, residents of the Klamath River region are more likely than most other Californians to have low incomes that preclude expensive travel to a faraway meeting in Redding at a time of day that would likely require an overnight stay. For example, Siskiyou County has 17.7% of residents below the poverty line, compared to 12.4% for the state as a whole. Unemployment rates in Siskiyou County are also disproportionately high. As such, holding a meeting only so close as Redding (a 3 hour drive from Happy Camp, CA) precludes participation by a segment of the population most affected by the issues under consideration in the SEIR and NOP. The environmental justice provisions of CEQA strongly suggest that a meeting in the Klamath area should be held. We suggest a meeting in Happy Camp or Orleans.

Due to the coincidence of the NOP scoping period with two federal holidays and Election Day, it makes common sense to extend the comment period beyond the current December 3 deadline. This will also help facilitate the addition of a meeting on the Klamath.

We appreciate your thoughtful consideration and response to these requests.

Sincerely,

Scott Harding

Scott Harding
Executive Director

From: Charles Wickman <crwickman@yahoo.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 3:03 PM
Subject: Suction Dredge Program Comments
Attachments: DFG Comments_12-03-09.doc

Dear Mr. Stopher,

We appreciate your acceptance of our comments. If you have any questions please contact either myself or Will Harling. As an organization that works closely with a broad cross section of Klamath River stakeholders, and invests a significant amount of time and resources monitoring Klamath River fisheries and implementing restoration projects on the river, we are more than happy to assist where we can.

Sincerely,

Charles Wickman

Fisheries Program Coordinator
Mid Klamath Watershed Council
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California Department of Fish and Game

Attn: Mark Stopher

Suction Dredge Program Comments

601 Locust Street

Redding, CA 96001

Introduction

Since 2001, the Mid Klamath Watershed Council (MKWC) has been working to restore the threatened Klamath River in Northern California, and the upslope habitats upon which the river depends.

The Klamath River and its tributaries, including the Salmon and Trinity rivers, have some of the largest remaining wild salmon runs in the lower 48 States and hold the promise of significant ecological improvement through restoration programs.

MKWC's programs in the Middle Klamath subbasin include Watershed Education, Invasive Weed Management, Monitoring, Riparian Restoration, Fire and Fuels, Water Conservation, Roads, Fisheries, and Native Plants.

We wish to thank the California Department of Fish and Game for the opportunity to submit written comments regarding suction dredge mining. Your request is seeking information regarding the scope and content of the SEIR and associated regulatory updates, including:

- Potential impacts of suction dredging
- Scope and range of alternatives
- Types or approaches to the regulatory updates
- Information regarding deleterious effects to fish, if any; and
- Types of activities to be regulated under the Department's suction dredge permit program

Background

In compliance with the court order issued in December 2006 as a result of a lawsuit brought against the California Department of Fish and Game by the Karuk Tribe of California (Karuk Tribe et al. v. California Department of Fish and Game, Superior Court of Alameda Case Number RG05211597), CDFG is currently preparing a subsequent environmental impact report (SEIR). As of the August 5th, 2009 passage of Senate Bill 670 all suction dredge activity in the state of California has been halted until CDFG completes the further environmental review mandated under the 2006 court order.

CDFG has already admitted additional restrictions will benefit and protect coho salmon, steelhead, green sturgeon and lamprey. "The Department believes suction dredge mining under the existing regulations in the Klamath, Scott and Salmon River watersheds is resulting in deleterious impacts on coho salmon (*Oncorhaynchus kisutch*), a species currently protected by the California Endangered Species Act ("CESA") (Fish and G. Code, § 2050 et seq.). (See Cal. Code Regs., tit. 14, § 670.5, subd. (b)(2)(E).) Because of this, the Department also believes its current suction dredge permitting program is not in compliance with California Fish and Game Code section 5653, subdivision (b), and section 5653.9." (Declaration of Banky E. Curtis CDFG Deputy Director of Regional Operations Case # 05211597 10/17/06).

Comment #1

- The State's 1994 final environmental impact report titled Adoption of Regulations for Suction Dredging is outdated.

Reasoning

A 1998 report by US Forest Service researchers, Dr. Bret Harvey and Dr. Tom Lisle, reviews the effects of suction dredging and gives an evaluation strategy. The report recommends a careful analysis of watersheds where suction dredging is being permitted such as the Klamath River and its tributaries. The 1998 report states "We recommend that managers carefully analyze each watershed so regulations can be tailored to particular issues and effects" (Harvey and Lisle 1998). The report supports our recommendations for updated suction dredging regulations which incorporate new information. Considering the uncertainty surrounding dredging effects, declines in many aquatic animal populations, and increasing public scrutiny of management decisions, the cost of assuming that human activities such as dredging cause no harm deserves strong consideration by decision makers (Mapstone 1995). Where threatened or endangered species exist, managers would be prudent to assume activities such as dredging are harmful unless proven otherwise (Dayton 1998). The impacts of suction dredging vary according to size of water body, fish species present, season of dredging, frequency and intensity of dredging. Cumulative impacts can result from small-scale mining in the same location for multiple years or from multiple mining operations occurring within an area (Washington Dept. of Fish and Wildlife Small Scale Mineral Prospecting White Paper Dec. 2006)

Recommendations
New information including scientific reports and studies should be incorporated into the Environmental Impact Report (EIR). An updated EIR should be concurrent with State and Federal Laws and Policies.

Comment #2

- The State does not protect State and Federal ESA listed species, and Species of Special Concern.

Reasoning
The risk of aquatic species becoming extinct has increased due to degraded habitat conditions. Distinct populations of Klamath River fish including, salmon, sturgeon and lamprey are at risk of extinction, while the 1994 EIR does not provide special protection for these at risk species.

Protection needs of Coho salmon were elevated due to the 1997 Federal ESA and 2003 State ESA listing of the Northern California Southern Oregon Coho Salmon ESU (NAS Report 2003 report pg 216). Coho Salmon were not listed as endangered or threatened under the states CESA or the federal ESA when the 1994 EIR was released. Other fish in the Klamath River have been petitioned to be listed since the 1994 EIR. They include green sturgeon, pacific lamprey and Klamath Mountain Province steelhead trout.

Dr. Peter B. Moyle has stated. "All anadromous fishes in the Klamath basin should be considered to be in decline and ultimately threatened with extirpation as wild populations because of the long history of decline and the multiple threats to the river system. Suction dredging, through a combination of disturbances of resident fish, alteration of substrates, and indirect effects of heavy human uses of small areas, especially thermal refugia, will further contribute to the decline of the fishes." (Declaration of Dr. Peter Moyle Case # 05211597 01/26/06)

The State Biological Opinion (SBO) in Appendix I of the 1994 EIR describes listed fish species and actions taken to protect those species. Specific reasons for actions, such as dredging closures were given for each listed species. Winter-run Chinook salmon in the Sacramento and San Joaquin River are listed as a State Endangered and Federal Threatened species and thus the entire geographic range of the species in those rivers are closed to suction dredging. Reasons for the closure are given on page 129 and 130 of the 1994 EIR. The same reasons for closure should apply equally to the Klamath River and all steams with ESA listed species.

Expert briefs from British Columbia, Canada court cases provide expert testimony regarding effects of suction dredging (Expert Brief of F.N. Leone Canada Dept. of Fisheries and Oceans Prince George, British Columbia 01/14/07 and Expert Brief of L.B. Mac Donald Canada Dept. of Fisheries and Oceans Prince George, British Columbia 09/22/98). The testimony states numerous direct and indirect effects on fish from suction dredging actions. The testimony concluded direct effects of sediment discharge from dredging operations can cause low fitness levels in fish making them more susceptible to disease. Furthermore, dredging sediments discharged can cause tissue damage to fish thereby increasing susceptibility to disease. In recent years fish disease levels in the Klamath River have reached epidemic type levels. According to U.S. Fish and Wildlife reports from 2004-2006, as much as 90 percent of the juvenile Chinook out-migrant fish were infected by lethal disease pathogens during spring and summer months (Nichols and Foott 2007, Nichols and Foott 2006, Foott et al 2007).

We can assume that actions allowed by current suction dredge regulations increase stress to fish therefore increasing susceptibility to lethal disease outbreaks.

Recommendations
The 1997 Federal ESA Coho listing and 2003 State ESA Coho listings have elevated the protection status of Coho salmon. A new "Biological Opinion" should be incorporated into a new updated EIR which ensures protection of ESA listed Coho.

Comment #3

- Cumulative impacts from suction dredging concurrent with other watershed degradations.

Reasoning
Current and historic anthropogenic disturbances to the river system include; dam construction, mining, agriculture, timber extraction, urbanization and excessive fish harvest (2003 NAS, Kier Associates 1991). These human caused disturbances are blamed for rivers degradation and fisheries losses. The 2003 National Academy of Sciences (NAS) report titled Endangered and Threatened Fishes in the Klamath River Basin: Causes of decline and strategies for recovery describes the environmental conditions of the Klamath Basin and the challenges to fisheries. The report states, "The mainstem Klamath River has become a challenging environment for anadromous fishes because of decreased flows and increased summer water temperatures" (NAS Report 2003 pg 242). The NAS report strongly suggests Klamath Basin fish populations are under considerable stress because of historic and continuing human caused degradation to the river environment, including mining. Mining is referenced many times in this report as a major contributing factor to the decline of fish in the Klamath Basin. The report in Chapter 4 on the topic of current and historic conditions in reference to the Salmon River states "Historical and continuing placer mining has reduced riparian cover and disturbed spawning and holding sites within the basin" (2003 NAS Report pg 143). The report further states "If habitat degradation continues, the Klamath River and its main tributaries will probably favor non-anadromous native and nonnative fishes increasingly at the expense of anadromous fishes" (2003 NAS Report pg 242-243).

Fish kills affecting adult and juvenile salmon occurred in 2000 and 2002 in the Klamath River (CDFG 2000, Gullian 2003). Based on anecdotal information there have been many "fish kills" in the main-stem Klamath River during the 1990's (NMFS Biological Opinion 2002). The CDFG documented a large juvenile fish kill in the Klamath River during late June and into late July of 2000 where "tens of thousands" of juvenile salmon were estimated to have died in the river (CDFG 2000, NMFS Biological Opinion 2002). A major adult fish kill occurred during September of 2002 where an estimated 60,000+ fish died (in the most recent DFG report) (DFG Fish Kill Report 2003, Guillen, 2003, Yurok Tribe 2002 Fish Kill Report). Actions allowed by the 1994 EIR degrade water quality and increase stress to fish therefore potentially increasing susceptibility to lethal disease outbreaks.

Recommendations
We recommend that no suction dredging permits are issued within the Klamath River or any other stream until cumulative impacts of suction dredging are fully assessed and understood. Furthermore, impacts should be considered concurrently with other watershed impacts.

Comment #4

- The State provides no protection measures for habitats critical to fish for daily survival and seasonal reproduction.

Reasoning
Current regulations require a "seasonal closure" on many streams to protect spawning fish and incubating eggs. Under current 1994 EIR regulations in and around fish spawning habitats, these requirements do not provide adequate protection from degradation of the physical condition of the

spawning habitat and integrity during the incubation period. Excavation of gravels, wood and other debris during the dredging process causes channel destabilization and ultimately degrades spawning habitat (Harvey and Lisle 1998). Unstable channels where spawning occurs are more prone to bed scour and subsequent spawning redds scour, and egg mortality during winter storm freshets and other high water events that salmon redds routinely endure (Harvey and Lisle 1999).

Recent reports (see Harvey and Lisle 1998, Harvey and Lisle 1999 and Science Applications International Corporation, March 2004, USFS Technical Memo from the Washington Office 1995) suggest suction dredging causes negative impacts to spawning habitat and spawning success of salmon. Harvey and Lisle in their 1999 report state, "Our results show that fisheries managers should consider the potential negative effects of dredge tailings on spawning success of fall-spawning fishes such as Chinook salmon and Coho salmon *O. kisutuch*."

Thermal refugia sites in the Klamath River are characterized as cold-water areas created by coldwater tributary inflow, seeps, springs, upwelling and groundwater in an otherwise warm water channel (US BOR 2004). Fish congregate at thermal refugia areas to avoid otherwise lethal temperature conditions in the mainstem river during the summer months when water temperatures are typically high in the Klamath River. Cold-water areas associated with tributary mouths are documented and recognized in recent reports as being important habitats for salmon during the summer months in the Klamath River. Thermal refugia sites in the Klamath River are important areas where salmonids avoid lethal conditions during warm periods when fish are exposed to high water temperatures. Suction dredging near and in thermal refugia sites subjects fish to physiological stresses compounded by the existing poor water quality conditions.

Recommendations

On-the-ground biological assessment should be preformed by a DFG biologist or otherwise qualified fisheries biologist to identify spawning habitat types and recommend site-specific closures. In the Clearwater National Forest suction dredge operations are only allowed to be located in areas of large substrate not preferred for spawning steelhead trout and bull trout (Science Applications International Corporation. March 2004).

It is further recommended that habitats critical for daily survival, such as thermal refugia areas, are protected under any proposed regulations regarding habitat protection.

Comment #5

- The State provides no special protection measures for non-fish aquatic species or non-salmonid species.

Reasoning

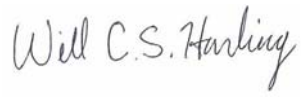
Aquatic species such as fresh water mussels and other non- salmonid fish species are not protected and are being harmed under current suction dredging regulations. A recent study that occurred in Washington State suggests that considerable mortality could be occurring where suction dredge tailing are dumped on mussel colonies (Krueger 2007) Freshwater mussels form immobile beds or colonies. They are susceptible to smothering by sediments released from suction dredge tailings.

Furthermore, the 1994 EIR does not protect non-salmonid fish species including green sturgeon and pacific lamprey. Both species are benthic type fish and sensitive to benthic disturbance caused by suction dredging. In addition, Foothill Yellow-Legged Frogs are State Listed Species of Special Concern and were not evaluated during the 1994 EIR.

Recommendations

It is recommended that deleterious dredging effects on non-salmonid or other aquatic species be fully evaluated and understood, and that affected species be afforded appropriate protections.

Sincerely,



Will Harling, Executive Director
Mid Klamath Watershed Council

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Miners Alliance
P.O. Box 531 Big Bar Ca.96010
530-623-1623

Mark Stopher
California Department of Fish and Game
Redding, Ca.

Dear Sirs,

Our first response to the SEIR,

pg.2

Please bring forward the "new and substantially more severe environmental impacts" so that Miners Alliance may examine this evidence. The Program does not present any new biological evidence. It is hard to comment on a document that uses the words may, could ' can result, probably, is believed, suggests and likely to describe damages from suction dredge mining. .It would appear that only peoples opinions and not facts are generating the new EIR. From your own chart on pg. 10 we see that dredge mining since the 1994 EIR has declined a substantial amount. In other words the "impact" from dredges has decreased and that the impacts from dredges are less than substantial. The Army Corp of Engineers found dredge mining to be deminimus, the 1999 Roger, Marshall dredge study in Alaska found no accumulative effects from 8&10 inch dredges on the 40 mile river. The argument about the effects of dredge mining seems to be a philosophical argument between those who believe nothing should be allowed on public land and those who actually do something on public land, and don't forget to throw in fisherman who think the rivers are only for them!

pg.14&15

Please eliminate or correct the ludicrous claims for yardage moved by various sized dredges . These figures come from a manufacture trying to sell equipment to"newbees". Most dredges are equipped with lawn mower engines and could not move the yardage claimed in a year. All other assumptions in the "Program" are skewed by the erroneous suction yardage numbers shown in the chart. The alleged effects of dredging change dramatically when realistic yardage estimates are used.

pg. 22

Thresholds of Significance

If there was going to be any significant impacts from dredging they would already have happened in 1980 when there was 12000 dredges in the water almost all I might add were operating at the same time.

pg. 26

No meaningful exchanges between government and dredgers can happen when the public, that is dredgers, are limited to comments on cards.

pg. 30

It has been my observation and that of most anyone that I have talked to, that tourists love seeing gold dredges.

pg. 34

Dredging for the most part is done in remote areas where there is little or no smog requirements . All rivers in California and most streams have major highways right next to the water way. Every time it rains the pollutants from the thousands of vehicles that use the roads wash into the waterways . No amount of dredges could equal this. Greenhouse gas emissions reduction has to be done at the manufacturing level not in the private sector.

pg. 37

Biological Resources

This was hashed over in committee meetings with the DFG for 4 years. I was an ad hoc committee member. I see nothing new here with the exception of mercury. Although the finding of mercury is a rare occurrence on most waterways{having dredged for 25 years for a living and found mercury one time} dredgers do California a great service by removing it from the waterways. How do you plan on addressing the natural occurring mercury deposits. With the exception of drought years the gravel in steams move every year grinding up the gravel and the mercury, and at the same time creating new spawning gravel. Mercury does not need a dredge to disturb it, mother nature does it for us on a far greater scale than any dredge could ever do.

pg.61>

Some of the rest of the potential impacts if not included in the SEIR would be laughable . Dredging up human remains? Buried under water? I did not know that Indians could scuba dive. Shipwrecks- haven't seen to many of those. If a river system is " holistically considered for cultural values " why are 3 million fisherman allowed to litterbug and stomp the ground to death? Hazardous materials, what about the millions of cars using the roads right next to the waterways. Half of California was just burnt up by wildland fires and they were not caused by dredgers. If dredges

degrade water quality than mother nature should be arrested. Camping on the public lands is within the jurisdiction of the US Forest Service and the BLM. The States jurisdiction is on state lands. Once again mercury is removed by dredges. The amount lost by a dredge is very small and inconsequential compared to the mercury and gravel movement in a storm. In your own words "suction dredge activities involve temporary and minor amounts of human activities."

It has been estimated that suction dredging in California generates over 60 million dollars . You have taken my livelihood , I consider the loss of any job especially in a depression to be significant.

Miners Alliance puts tongue in cheek to suggest a definition of deleterious ; putting a hook in a fishes mouth and dragging it up on shore, and yes unlike may, could, or might affect the fisheries, that fish is dead. With commercial fishing, Indians, dams and recreational fisherman to the tune of three million it is hard to even find the effects of dredging. Fisherman the holy grail of the DFG kill millions of fish a year and add thousands of pounds of lead to the streams, something that has the potential to be way worse than mercury. Dredgers, for free, remove the lead and mercury and enhance potential spawning gravel by liberating the trapped sediment – to be washed away in the winter and spring.

Thank you,

Dan Morrison

Co Founder Miners Alliance

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December 3, 2009

BY FIRST CLASS MAIL AND E-MAIL (dfgsuctiondredge@dfg.ca.gov)

California Department of Fish and Game
Attn: Mark Stropher
Suction Dredge Program Comments
601 Locust Street
Redding, CA 96001

Re: *Suction Dredge Program Comments*

Dear Mr. Stropher:

Enclosed please find "Additional Comments of The New 49'ers, Inc." pertaining to the scope of the SEIR. We look forward to continuing to work with you to develop a sound CEQA document and environmentally-sound suction dredging program.

Sincerely,

James L. Buchal
Counsel to The New 49'ers, Inc.

ADDITIONAL COMMENTS OF THE NEW 49'ERS, INC.

The Fundamental Nature of the Document

The entire premise of the additional CEQA review, as established in the consent decree, was that "new information" had become available as to the significance of the ongoing activities. We strongly suggest that the proper focus of the SEIS should be to assess the significance of the "new information," not to start from scratch to re-do the 1994 FEIS.

As we have previously noted, we do not believe that any full-blown supplemental EIR is required at all, insofar as the listing of coho salmon species, while arguably "new information," is not associated with any real-world changes in environmental impact beyond those previously evaluated in 1994. Moreover, there is no additional "new information" of which we are aware meeting the standards in Guideline § 15162 to justify a supplemental EIR, as opposed to an addendum. In particular, we have yet to find evidence of any significant effects which were not discussed in the previous EIR, evidence of substantially more severe effects, or newly-available mitigation measures. To us, the NOP appears as if you have decided to re-evaluate all of the information which was already settled during the earlier EIR, rather than assess the impact of new data.

The 1994 FEIR provides ample consideration of the ongoing impacts of suction dredge mining under the existing regulations; the scope of the SEIS need only consider the "new information" since 1994, and the environmental impacts of any proposed changes to the regulations. As the California courts have explained, even a supplemental EIR is "not an occasion to revisit environmental concerns laid to rest in the original analysis". *Save our Neighborhood v. Lishman* (2006) 140 Cal. App.4th 1288, 45 Cal. Rptr.3d 306.

The presence of the existing FEIR distinguishes this case from cases such as *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 51 Cal. App.4th 1165, 61 Cal. Rptr.2d 447, in which the absence of an existing EIR provided a rationale for additional environmental analyses even for existing facilities.

We do not believe that the Superior Court and Legislative Assembly's actions with respect to suction dredge mining, arising by reason of the Department's failure to complete CEQA processes sooner, have any bearing on the appropriate scope of the environmental analysis required. (*Cf.* NOP at 21.) Rather, we believe that the Department needs to tightly focus this CEQA upon genuinely new information which was not previously considered in the 1994 EIR. A $60 million industry relies upon the foundations established in the 1994 EIR, which ought not to be disturbed absent any genuine reason to revisit environmental concerns which were exhaustively ventilated in the prior CEQA process.

Issues Concerning the Environmental Baseline

Section 15125 of the CEQA Guidelines sets forth the general rule that environmental conditions existing at the time environmental analysis is commenced "normally" constitute the baseline for purposes of determining whether an impact is significant. Indeed, pursuant to Public Resources Code § 21060.5, the "environment" means "the physical conditions which exist within the area which will be affected by a proposed project".

Here the Department proposes to adopt a "conservative" approach of using an environmental baseline which assumes no suction dredging in California. We believe this is inconsistent with the definition of the proposed project: "continued implementation of the permitting program, and, if necessary, proposed amendments to the Department's existing regulations . . .". (NOP at 2.) A proper baseline approach would assume continued dredging operations at recent permit issuance levels. From that baseline, the Department might appropriately assess impacts of any alternative from no further permits (not legally feasible) to substantial increases in the number of permits.

A large body of law supports the notion that in the context of ongoing and longstanding activities such as suction dredge mining, the baseline analysis should ordinarily evaluate the significance of incremental impacts of any changes in such activity that might result from project changes, *not* the significance of the baseline level of activity. *Cf., e.g., Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal. App.4th 1170, 31 Cal. Rptr.3d 901 ("the physical impacts of established levels of a particular use have been considered part of the existing environmental baseline"); *Fat v. County of Sacramento* (2002), 97 Cal. App.4th 11270, 119 Cal. Rptr.2d 402 (affirming negative declaration with baseline of existing airport usage); *Save our Peninsula Committee v. Monterey County Board of Supervisors* (2001), 87 Cal. App.4th 99, 104 Cal. Rptr.2d 326 (appropriate to use baseline of existing water usage); *Fairview Neighbors v. County of Ventura*, 70 Cal. App.4th 238, 82 Cal. Rptr.2d 436 (using baseline traffic impacts from "ongoing mining operation"); *Committee for a Progressive Gilroy v. State Water Resources Control Board* (1987) 192 Cal. App.3d 847, 237 Cal. Rptr. 723 (applying "existing facility" categorical exemption).

Where, as here, the question concerns review of a private activity conducted pursuant to private property rights, we believe it would be much more appropriate for the Department to consider the impacts of changes to the activity and new information, not to waste public resources through a "fresh look" from the beginning. For example, in *Bloom v. McGurk* (1994) 26 Cal. App.4th 1307, 31 Cal. Rptr.2d 914, the question concerned "ongoing operation of a medical waste treatment facility under a new regulatory scheme", and the Court of Appeals rejected attempts to nullify the applicability of a categorical exemption on the basis of the absence of prior environmental documentation.

The choice of an appropriate baseline recognizing ongoing dredging is especially important because the present environmental conditions include the proven positive impacts of suction dredge mining for many years under the existing regulations, and whatever adverse impacts are imagined to arise from many years of suction dredge mining under the existing regulations. Indeed, all or substantially all of the data available to the Department will consist of studies and evaluations of the environmental conditions under ongoing suction dredge mining.

In substance, the Department is proposing to adopt an artificial baseline as to which no real-world data concerning environmental conditions is available. But "[a]n EIR must focus on impacts to the existing environment, not hypothetical situations". *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App.4th 931, 91 Cal. Rptr.2d 66; *see also Riverwatch v. County of San Diego* (1999), 76 Cal. App.4th 1428, 91 Cal. Rptr.2d 322 (trial court "abused its discretion by requiring that the EIR account for prior illegal activity by using an early baseline from which impacts could be measured").

To the extent that the Department proposes to go forward by imagining a hypothetic set of non-existent physical conditions associated with "no dredging," it will be especially important to reconstruct those conditions inimical to the salmonid species that are a focal point of the SEIR, and the listing of which provided the legal predicate for the "new information" finding in the Consent Decree. In particular, the Department will be required to assemble historical data concerning the natural, concretized state of the Lower Salmon and other California rivers prior to years of suction dredging, during which time large stretches of the Klamath and other river systems in California contained little or not suitable spawning habitat for salmon species because of the concretized nature of the river bed.[1] The Department should also consider how hypothesized global climate changes would tend to reduce the hydraulic energy available for natural reconditioning of spawning beds, making the adverse impacts of the "no project" condition even more significant.

We do understand that the Guidelines (§ 15125(a)) refer to the physical conditions "at the time the notice of preparation is published"—here October 26, 2009. But the Guidelines also recognize that "[t]his environmental setting will *normally* constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (*id.*; emphasis added), affording discretion to use common sense to adopt a baseline appropriate to the circumstances. We believe it would be unreasonable for the Department to utilize an environmental baseline premised on a single instant in time, a time of year during which many California rivers and streams are closed to suction dredging. The Department has discretion to adopt a common sense approach based on consideration of baseline suction dredging activity during the dredging season. The

[1] The Department describes suction dredge mining's impact of loosening spawning gravel only in terms of a potential initial effect of creating unstable spawning areas. There is no empirical evidence whatsoever of any incremental risk of scouring from spawning in suction dredge mining tailings, and any instability from elevated piles (not attractive to the fish in any event), would vanish after the first year, leaving behind useful spawning habitat for many years. (*Cf.* NOP at 39.)

reasonable direction would be to use a baseline which reflects recent suction dredging activity supported by the regulations which are in question.

While we doubt the Department has enough discretion to attempt to re-create imaginary conditions absent ongoing suction dredging, the Department has not articulated, and cannot articulate, any explanation that would support such a deviation. The action of the Superior Court and Legislative Assembly to impose a temporary moratorium on suction dredge mining during the CEQA analysis was plainly not intended to affect the scope of that analysis by creating an entirely distinct environmental baseline. Moreover, the positive impacts of suction dredging will clearly persist through the moratorium, as it takes many years for stream beds to become "concretized" though sedimentation.

The Miners understand that the Department believes its "baseline" approach will provide a "'fresh look' at the impacts of suction dredge mining on the environment generally," but the Department is confusing the question of the environmental baseline with the scope of the project. The Department might properly include a "no project" alternative in the SEIR, but analyze the environmental impacts of such an alternative against the real, existing environmental baseline with ongoing suction dredging.

We are concerned that adoption of an improper baseline imagining no ongoing dredging may lead to improper findings of "significant effects," which may then require the Department to issue some statement of overriding considerations to outweigh such effects (Public Resources Code § 21081). The Department will have to make special efforts to support such overriding considerations, which will presumably include invaluable assistance to distressed rural economies, with substantial evidence in the record.

We note that the Department proposes to rely upon Appendix G guidelines for ascertaining significance, and note that Appendix G ascribes significance to the "loss of availability of a known mineral resource that would be of value to the region and the residents of the state." The Department should find that restrictions on suction dredging would give rise to such significant and adverse effect that should outweigh other, lesser factors. It is troubling to see that the Department has not identified "mineral resources" as among the environmental factors potentially affected by the project decisionmaking. (NOP at 28; *see also id.* at 78 (dismissing effects as "less than significant").) Insofar as there is a very wide range of permit issuance within the scope of the broadly defined "project"—presumably all the way down to no permit issuance—the effects of the loss of ability to mine the last commercially-significant deposits of placer gold cannot be dismissed as insignificant.

Issues Concerning "Deleterious Effect"

The Department correctly recognizes "the common sense meaning of the word deleterious such that deleterious effect generally means a wide-ranging or long-lasting consequence for a fish population that extends beyond the temporal or spatial context of a

specific direct impact". (NOP at 7.) Here, however, it is important to recognize that the project involves no specific direct impact on any fish species of any practical importance, with direct impacts only upon benthic invertebrates. The Department should reject the notion that a "deleterious impact" might involve any impact whatsoever upon species listed under the state or federal Endangered Species Act, insofar as those statutes merely impose a duty upon the State to avoid jeopardizing the continued existence of the listed species. Rather, the Department should require, consistent with regulatory guidance issued under those statutes, that "deleterious effects" mean an appreciable and negative impact on populations of listed species, similar to the language proposed for non-listed fish species: "a substantial reduction in the range of any species, and/or extirpation of a population". In focusing upon population-level effects, the Department should not address effects on units of protected species which are any smaller than the management units defined for purposes of the state or federal Endangered Species Act.

Issues Concerning Land Use and Planning

Other commentators have provided the Department with substantial information concerning the federal regulatory scheme for mining on federal land, which describes most suction dredge mining in California. The Appendix G Guidelines ask, among other things, whether the project would "conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project . . .". The present claim of no conflict with such regulations (NOP at 76) does not appear to take account of federal land management agencies and their mining regulations.

Scope of Literature Reviewed

We understand that the CEQA documents at this stage might necessarily contain more speculative, subjective and qualitative information, to be refined in the course of the study. However, in assessing the significance of asserted impacts, it will be important to have a *quantitative* sense of whether or not suction dredge mining has appreciable impacts on fish populations.

The U.S. Forest Service commissioned such as study, engaging Professor Peter B. Bayley, of the Department of Fish & Wildlife at Oregon State University, to conduct a comprehensive study to assess asserted cumulative impacts on fish populations in the Siskiyou National Forest. His Final Report was issued in April 2003, and represents the only scientific study of which we are presently aware that has attempted to *measure* the asserted cumulative impacts of suction dredge mining (as opposed to merely speculating about possible effects in a qualitative manner). He concluded:

> "Localized, short-term effects of suction dredge mining have been documented in a qualitative sense. However, on the scales occupied by fish populations such local disturbances would need a strong cumulative intensity of many operations to have a measurable effect. Local information reveals that most suction dredge miners adhere more or less to guidelines that have recently been formalized by the Forest Service and generally in . . . Oregon, but there are

individual cases where egregious mismanagement of the immediate environment has occurred, particularly with respect to damaging river banks in various ways. This analysis cannot account for individual transgressions, and a study to do so at the appropriate scale would be very expensive if feasible.

"Given that this analysis could not detect an effect averaged over good and bad miners and that a more powerful study would be very expensive, it would seem that public money would be better spent on encouraging compliance with current guidelines than on further study".

This study corroborated the findings of numerous prior cumulative impact studies, all of which have previously been submitted to the Department in response to its October 2007 request for information. We trust that by the time the draft SEIR is issued, the Bayley study and other submitted materials will find their place above the more speculative references presently cited by the Department. *Cf., e.g.,* NOP at 95 (referencing "invertebrate productivity in subtropical black-water rivers"), 101 (fish behavior on "tropical reef").