Karuk Tribe • Klamath Riverkeeper • Pacific Coast Federation of Fishermen's Associations • Institute for Fisheries Resources • Friends of the Trinity River • Northern California Council, Federation of Fly Fishers • Foothills Angler Coalition • Upper American River Foundation • Butte Environmental Council • Friends of the River • Center for Biological Diversity • Friends of the North Fork • Granite Bay Flycasters • Southern California Watershed Alliance • Environmental Law Foundation • Environmental Justice Coalition for Water • Klamath-Siskiyou Wildlands Center • Rogue Riverkeeper • Environmental Protection and Information Center • California Sportfishing Protection Alliance • Mid-Klamath Watershed Council •Friends of the Eel River

May 9, 2010

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

Dear Mr. Stopher:

The groups identified below worked collaboratively and appreciate the opportunity to submit these written comments on the Department's Draft Subsequent Environmental Impact Report and Draft Regulations. It is clear that significant time and effort were expended to draft the dSEIR and proposed regulations. However, we ask that the Department take the following comments into account, as we still see significant harms that we believe can and must be mitigated. 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 are submitted on behalf of the following groups and governments: Karuk Tribe, Klamath Riverkeeper, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, Friends of the Trinity River, Northern California Council, Federation of Fly Fishers, Foothills Angler Coalition, Upper American River Foundation, Butte Environmental Council, Friends of the River, Center for Biological Diversity, Friends of the North Fork, Granite Bay Flycasters, Southern California Watershed Alliance, Environmental Law Foundation, Environmental Justice Coalition for Water, Klamath-Siskiyou Wildlands Center, Rogue Riverkeeper, Environmental Protection and Information Center, California Sportfishing Protection Alliance, Friends of the Eel River and the Mid-Klamath Watershed Council.

Sincerely,

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Karuk Tribe
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Background

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, the Institute for Fisheries Resources, Klamath Riverkeeper, the Sierra Fund, Friends of the North Fork, Friends of the River, California Trout, the California Tribal Business Alliance and others to support legislation resulting in a statewide moratorium on suction dredge mining until the court order was fulfilled (SB 670, Wiggins).

In addition, the Karuk Tribe collaborated with others in 2009, including Pacific Coast Federation of Fishermen's Associations, Institute of Fisheries Resources, Center for Biological Diversity, Klamath Riverkeeper, Friends of the Earth, and California Sportsfishing Protection Alliance, in further litigation over Fish and Game's improper use of tax payer dollars to fund the suction dredge mining permitting program. That litigation, which is ongoing, also resulted in a court ordered moratorium on issuance of permits until new regulations are adopted.

Since the legislative and court ordered moratoriums on the issuance of dredge permits were enacted the Department has moved quickly to promulgate new rules and regulations.

In December of 2009 we provided extensive comments on the Department's Initial Study of the effects of suction dredge mining. We appreciate the opportunity to continue participating in this process with these comments on the draft Subsequent Environmental Impact Report (dSEIR).

The comments below build on all information previously submitted as part of the current CEQA process.

COMMENT # 1: THE DEPARTMENT MUST COMPLY WITH THE REQUIREMENTS AND PROTECTIONS PROVIDED IN CEQA AND FISH AND GAME CODE §§5653, 5653.9 TO ENSURE THAT NO SUCTION DREDGE MINING OPERATION WILL CAUSE DELETERIOUS IMPACTS TO FISH.

Reasoning

Fish and Game Code §§5653 is a rather unique environmental statute. The plain language of subsections (a) and (b) require the Department to prohibit suction dredge mining throughout the state of California, unless the Department: (1) adopts regulations that comply with CEQA and the APA; *and* (2) makes a determination prior to the issuance of any permit that no deleterious impacts will occur to fish from the proposed suction dredge mining operation.

In other words, if the Department has information indicating that suction dredging activities *may* cause deleterious impacts to fish on a particular river segment or stream, *or if the Department lacks the data to reasonably ensure that no deleterious impacts will occur to fish*, the Department *must prohibit* suction dredge mining activities on the respective water body.

The Department can satisfy its obligations under CEQA and Fish and Game §5653 in one of two ways:

(1) during the rulemaking phase, the Department can prohibit suction dredge mining on all river segments and streams unless it has reasonable quantitative or qualitative information to establish that individual and cumulative suction dredge mining activities will not cause deleterious impacts to fish; or

(2) during the permit issuance phase, the Department can conduct the required analysis on a permit-by-permit basis (which would require permit applicants to submit site specific information about their proposed suction dredging operations).

Clearly, the first option is superior for the protection of fish, their habitat and water quality, and to avoid unreasonable time constraints on Departmental staff. Not surprisingly, the dSEIR and draft regulations indicate that the Department does not intend to undergo a deleterious impact analysis on a permit-by-permit basis. Therefore, in order to comply with CEQA and Fish and Game Code §§5653 and 5653.9, the Department must close all river segments and streams to suction dredge mining unless it has sufficient information to establish no deleterious impacts will occur to fish.

However, the dSEIR and draft regulations have done the exact opposite. The Department is allowing suction dredge mining on all river segments and streams *unless* it has evidence to establish that suction dredge mining will cause deleterious impacts to fish.[1]

[1] Moreover, as discussed in Comment Nos. 2 and 29, the Department has applied an inappropriately narrow standard to determine what is a 'deleterious impact' to fish. The Department also claims it lacks the authority to regulate impacts on water quality, even when adverse affects on water quality directly cause

For example, the dSEIR provided considerable analysis and evidence regarding the adverse impacts caused from suction dredging in rivers historically used for mining, due to the resuspension and methylization of mercury. The dSEIR provides the names of these rivers, and also identifies those rivers listed as impaired for mercury and turbidity under the [proposed] 2010 303(d) list. The dSEIR concludes that suction dredge mining on these rivers will cause significant adverse impacts to water quality and biological resources. The dSEIR logically raises the closing of these rivers to suction dredge mining to mitigate the adverse impacts.

However, the Department rejected this mitigation measure. Instead, it is *not* closing *any* rivers that were historically used for mining, *nor any* rivers listed as impaired for mercury or turbidity on the 303(d) list. The Department rationalized that it cannot definitively identify *all* river segments in which suction dredge mining will cause resuspension and methylization of mercury. Therefore, closing the rivers on which it knows this will occur may not mitigate all adverse impacts from mercury (*i.e.* some rivers may be overlooked). The Department concluded that the adverse impacts from resuspension and methylization of mercury are "unavoidable." *See also* dSEIR §6.2.3, pp. 6-4 (Significant and Unavoidable Impacts).

This analysis is nonsensical. Moreover, the Department is in clear violation of CEQA, which requires adoption of all feasible mitigation measures. In this case, feasible mitigation would involve the mere proscription all such rivers (historically used for mining and impaired for mercury and turbidity) as "Class A" under its regulations, which would prohibit suction dredge mining year round. 14 CCR §228.5(b). Such a mitigation measure is not only feasible, and therefore required under CEQA, it is mandated under Fish and Game §5653, which prohibits the issuance of permits for suction dredging activities unless the Department determines the operation will not be deleterious to fish.[2] In this case, the Department has determined the activity *will be* deleterious to fish. Thus, allowing it to occur without mitigation is without basis in law or fact.

Recommendation

Close suction dredge mining to all river segments, streams and lakes unless the Department has reasonable quantitative or qualitative information to establish that suction dredge mining activities will not cause deleterious impacts to fish or their habitat, including water quality. In addition, this determination must be made by applying a common use definition of "deleterious", such as that found in a dictionary. (See Comment No. 2.)

Such closures would at a minimum include, but not be limited to, the following:

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harm to fish. As discussed in more detail below, the Department's interpretation of the plain language of the authorizing statute for its permitting program, as well as its authority under CEQA and the Fish and Game Code, are narrow to the point of absurdity.

[2] For further discussion and details, please refer to our Initial Study comments.

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

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

3. All river segments and streams designated as components of the National or California Wild and Scenic Rivers System or deemed eligible for protection by federal or state agencies under such systems. Federal and State 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 and state protected rivers must meet or exceed federal or state criteria or federally approved state standards for aesthetics, fish and wildlife propagation, and primary contact recreation.[3]

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;[4]

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, impacts to cultural resources; fuel spillages, or handling of hazardous materials.

In addition, the Department must clearly state in the final regulations that it will deny any permit application if it has reasonable belief that suction dredge mining will occur on a river segment or in a manner that may cause deleterious impacts to fish or that was not

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

[4] Public Resources Code Section 5093.61.

reviewed for its deleterious impacts to fish during the 2011 rulemaking process, and therefore its impacts are unknown.

It is also strongly suggested that the Department state in its regulations that it will undergo a rulemaking process to reclassify any particular river segment, stream or lake if it obtains sufficient new information to warrant it, pursuant to CEQA and the APA.

COMMENT # 2: THE DSEIR INAPPROPRIATELY DEFINES "DELETERIOUS" EFFECTS TO FISH.

The dSEIR Page 2-5 states:

> *Generally, CDFG concludes that an effect which is deleterious to Fish, for purposes of section 5653, is one which manifests at the community or population level and persists for longer than one reproductive or migration cycle. The approach is also consistent with the legislative history of section 5653. The history establishes that, in enacting section 5653, the Legislature was focused principally on protecting specific fish species from suction dredging during particularly vulnerable times of those species' spawning life cycle.*

Under the cannons of statutory interpretation, it is presumed that the legislature intended undefined words to have the same meaning they are given in every day usage. Fish and Game Code §5653 does not define "deleterious." The word is defined in Webster's as *harmful, often in a subtle or unexpected way*. The definition assigned by the Department is entirely too narrow. The Department asserts that its definition is consistent with the legislative history of Fish and Game §5653. However, the Department provides no basis for its claim. In fact, a review of the legislative history makes clear that the Department's contention is patently false.

The primary references and a summary of the documented legislative history of §5653, dating back to 1873, was provided to the Department in a communication on March 10, 2010 by Friends of the North Fork. In their letter, Friends of the North Fork pointed out that:

- In 1961, "deleterious to fish" found its way into the first California statute regulating suction dredge mining, Fish and Game Code Section 5653, in Assembly Bill 1459 (Arnold). In his letter to the governor requesting a signature on the bill, Assemblyman Arnold used terms like "damage" and "disturb." He said dredging should be done so as not to cause anything other than "minimal damage" to fish, from which he specifically included disturbing eggs, disturbing fish food organisms and stirring up silt to cause an "aesthetic problem" and cover eggs.

- The intent was clear. Any "damage" from dredging activities must be "minimal." Clearly, the author's view was that disturbing eggs, disturbing fish food

organisms and stirring up silt to cause an "aesthetic problem" and cover eggs is more than minimal, and thus is “deleterious to fish.”

- In an analysis of AB 1459 provided to members of the Legislature in 1961, the Legislative Analyst’s Office said that, under the bill, “the department must then determine whether the operation will be safe for fish life and if so it will issue a permit to the applicant.” So, in that view of the intent of “not deleterious to fish,” legislators were informed that it meant the activity is “safe for fish life.”

- In a letter to the Governor requesting his signature on AB 1459, the Department of Fish and Game said, “The department shall issue a permit if it is judged that no damage will occur to fish, aquatic life, and the aquatic environment.” So in information on which the Governor based his decision to sign AB 1459 into law, “not deleterious to fish” meant “no damage” to “fish, aquatic life and the aquatic environment.”

- In the handful of bills since 1961 affecting this section, no legislation has ever used a term other than "deleterious to fish" nor offered any other interpretation of its meaning.

Thus we assert that the Department has failed to justify its claim that the definition of ‘deleterious effect’ used in the dSEIR, that is *one which manifests at the community or population level and persists for longer than one reproductive or migration cycle* is consistent with the legislative history.

Recommendation

Adopt a definition for phrase ‘deleterious effect’ that is consistent with the legally acceptable dictionary definition of the word ‘deleterious.’ We suggest the following language be included in the Fish and Game Code:

A vacuum or suction dredge operation and activities associated with its operation are deleterious to fish, mollusks, crustaceans, invertebrates, or amphibians if either (1) it deposits, alters, flours or re-suspends any substance or material in the river, stream or lake that has a harmful effect on any life stage of “fish” or (2) alters the behavior of “fish” so as to have a harmful effect or (3) results in the modification or alteration of in stream or riparian habitats in a way that has a harmful effect on the ability of “fish” to successfully feed, reproduce or evade predators.

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

The Department should evaluate whether or not it has the capacity to enforce the proposed regulations under existing fee structure and budget. We note that the Senate Natural Resources Committee staff analysis for SB 670 concluded that:

> *"In previous years, DFG has acknowledged that the dredging program's fees are inadequate to cover the cost of the program. It has previously estimated that the permits cost an average of $450 to process and to cover the costs of the program, which if extrapolated to the approximate 3000 permits would result in an expenditure of about $1.3 million…"*

Commenters note that the Department claims that the annual average revenue generated by the program is $375,000.[5]

Clearly, the fees associated with permit applications do not cover the costs of the program. This is further demonstrated by Judge Roesch's July 9, 2009 Order Granting Plaintiff's Motion for a Preliminary Injunction, which ordered the Department to *"immediately cease and desist from using funds obtained by them from the State of California General Fund to issue suction dredge permits…"*[6] *Hillman v. Dept. Of Fish and Game,* Alameda County Superior Court, Case No. RG09434444. This order effectively shut down the program.

To state it another way, the dredge program is subsidized by taxpayers at a time when budget cuts are resulting in layoffs of teachers, law enforcement, and emergency personnel. Can the Department commit itself to long term enforcement of a complex regulatory program involving thousands of miners in remote corners of the state when it depends on General Funds to finance it? This problem should be thoroughly evaluated in the dSEIR.

Although the Department asserts that is has no flexibility to alter fees without legislative consent, we note that Fish and Game §5653 (c) states:

> *The department shall issue a permit upon the payment, in the case of a resident, of a base fee of twenty-five dollars ($25**), as adjusted under Section 713**, when an onsite investigation of the project size is not deemed necessary by the department, and a base fee of one hundred thirty dollars ($130**), as adjusted under Section713**, when the department deems that an onsite investigation is necessary. In the case of a nonresident, the base fee shall be one hundred dollars ($100), as adjusted **under Section 713**, when an onsite investigation is not deemed necessary, and a base fee of two hundred twenty dollars ($220), **as adjusted under Section 713**, when an onsite investigation is deemed necessary* (emphasis added).

[5] Suction Dredge Form 399 Exhibit C.

[6] Hillman et al. v Department of Fish and Game, Alameda County Superior Court Ruling, July 9, 2009, Case RG09- 434444

Section 713 (f) states:

> *The department shall, at least every five years, analyze all fees for licenses, stamps, permits, tags, and other entitlements issued by it to ensure the appropriate fee amount is charged.* ***Where appropriate, the department shall recommend to the Legislature or the commission that fees established by the commission or the Legislature be adjusted to ensure that those fees are appropriate*** (emphasis added).

Recommendation

The Department should limit the scope of its suction dredge program on the basis of what its finances allow under the current fee structure or else propose a fee increase to allow for implementation of the proposed regulations. In other words, it should limit the program to what it can honestly and pragmatically enforce and manage or else charge more for permits. Otherwise the Department cannot assure that its obligation to regulate and monitor suction dredge mining activities to prevent a deleterious impact can be met.

The current dSEIR fails to evaluate how the department, with existing budgetary constraints, can possibly check 4,000 dredge operations for compliance with detailed regulations regarding distances to stream banks, presence of mussel beds, and presence of spawning salmonids in real time. Moreover, the dSEIR concludes that certain activities will not result in adverse impacts, based on the presumption that miners will adhere to prescribed restrictions on the respective activity, such as practicing reasonable care to limit impacts of turbidity or the responsible handling of found native artifacts, without guidance on what is expected. Without the means to enforce these key areas, the adverse impacts of dredging even under the updated regulations will be significant. We strongly suggest limiting the program to that which the Department can reasonably and pragmatically implement and enforce.

COMMENT #4: THE SEIR MUST COMPLY WITH THE DEPARTMENT'S DUTY UNDER CEQA TO INFORM THE PUBLIC OF HOW THE PROPOSED ACTION CONFLICTS WITH EXISTING LAWS AND THE FACILITATION OF OTHER PERMITTING PROGRAMS

Reasoning

An EIR is required to be an informational document from which the public can properly weigh any adverse effects presented by a project.[7] The dSEIR must fully disclose and analyze the Project's potential conflicts with existing laws and regulatory programs. More importantly, the Department is required to operate its program in conformity with other existing state and federal laws, pursuant to the Public Trust and the Business and Professions Code.

[7] 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.

Although the dSEIR does conclude that the proposed action would indeed have significant and unavoidable impacts on water quality, passerines, and cultural sites, it fails to describe how the proposed action conflicts with existing state and federal laws and what agencies would be responsible for regulating these impacts.

CEQA requires the SEIR to analyze whether the Project will "[v]iolate any water quality standards or waste discharge requirements."[8] 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. For example, we will note below inconsistencies with the Klamath TMDL.

In addition, the draft regulations allow suction dredge mining to occur on river segments and streams included in both the State and Federal Wild and Scenic Rivers Acts. See Table below (Wild and Scenic Rivers Open to Suction Dredge Mining Under Draft Regulation). In particular, the State Act requires all departments to use their authority under all existing laws to protect the free flowing nature of the rivers and prevent against negative impacts for the extraordinary values for which they were adopted into the system, such as their cold water fisheries and high clarity of the water. Public Resources Code §5093.61.

Recommendation

We assert that the SEIR 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, the state and federal Wild and Scenic Rivers Acts, and the national Endangered Species Act. In addition, the EIR should describe what additional permits may be required for mining to be consistent with other applicable laws.

We recommend, at a minimum, that suction dredge mining, currently allowed under the draft 2011 regulations, be prohibited on the river and stream segments identified in the follow six tables, due to their: (1) adoption into the State and/or Federal Wild and Scenic Rivers Act; (2) their closures under the 1994 Regulations; (3) status as California Heritage and Wild Trout Waters; (4) identification as Central Valley Steelhead and Salmon Critical Habitat and Reintroduction Areas; (5) California Red-Legged Frog Critical Habitat; and (6) Central Valley Mercury-Impaired Waters:

Wild and Scenic Rivers Open to Suction Dredge Mining Under Draft Regulations			
RIVER	SEGMENT	CLASS	REGULATION
NF American River (FD)	Upstream of Big Valley Ck	H	Open year round
NF American (FD, FE)	Clementine Dam to Big Valley Creek	G	Open Sep. 1-30
Black Butte (FD)	Mendocino County	F	Jul. 1 – Sep. 30
Cache Creek (SD)	Mainstem/tribs	F	Jul. 1 – Sep. 30
East Carson River (SD/FE)	Carson Falls to Nevada state line	G	Open Sep. 1-30
Eel River (SD/FD)	Mendocino & Humboldt Counties	F	Jul. 1 – Sep. 30

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

NF Eel River (SD/FD)	Mendocino County	F	Jul. 1 – Sep. 30
Middle Eel (SD/FD, FE)	Mendocino County	F	Jul. 1 – Sep. 30
SF Eel River (SD/FD)	Mendocino County	F	Jul. 1 – Sep. 30
MF Feather River (FD)	Main stem	D	Open Jul. 1 – Jan 31
NF/SF Kern River (FD)	1000-4000 feet elevation	F	Jul. 1 – Sep. 30
SF Kings River	1000-4000 feet elevation	F	Jul. 1 – Sep. 30
MF Kings River	1000-4000 feet elevation	F	Jul. 1 – Sep. 30
Klamath (SD/FD)	Below 4000 ft in Siskiyou and Humboldt Counties	F	Jul. 1 – Sep. 30
Klamath (SD/FD)	In Del Norte County	D	Open Jul. 1 – Jan 31
Merced/SF Merced (FD)	From 2000-5000 feet elevation	D	Open Jul. 1 – Jan 31
Merced/SF Merced (FD)	Below 2000 feet elevation	F	Open Jul. 1 – Sep. 30
Owens River Hdwtrs. (FD)	Includes Glass and Deadman Creeks	H	Open year round
Palm Canyon Creek (FD)	Main stem	H	Open year round
Middle Piru Creek (FD, FE)	Fish Creek to Pyramid Dam	H	Open year round
Salmon (SD/FD)	Below 4000 feet elevation	F	Open Jul. 1 – Sep. 30
Scott River (SD/FD)	Main stem	F	Jul. 1 – Sep. 30
Sisquoc River (FD)	Mainstem/tribs	D	Open Jul. 1 – Jan 31
Smith River (SD, FD)	Main stem downstream of NF/SF confluence	F	Jul. 1 – Sep. 30
NF Smith (SD, FD)	Mainstem/tribs	B	Open Jul. 1 – Aug. 31
MF Smith (SD, FD)	Mainstem/tribs to Knopti Creek	B	Open Jul. 1 – Aug. 31
MF Smith (SD, FD)	Mainstem/tribs upstream of Knopti Creek	F	Jul. 1 – Sep. 30
SF Smith (SD, FD)	Main stem and tribs from to Quartz Ck	B	Open Jul. 1 – Aug. 31
SF Smith (SD, FD)	Mainstem/tribs upstream of Quartz Creek	F	Jul. 1 – Sep. 30
Trinity River (SD/FD)	Main stem from Humboldt County line to North Fork	D	Open Jul. 1 – Jan 31
Trinity River (SD/FD)	Main stem from North Fork to Grass Valley Creek	C	Open Jun. 1 – Sep. 30
SF Trinity River (SD/FD)	Main stem	B	Open Jul. 1 – Aug. 31
Tuolumne River (FD)	From 2000-5500 ft	D	Open Jul. 1 – Jan 31
West Walker (SD, FE)	Mainstem/tribs below 7,000 feet	G	Open Sep. 1 – Sep. 30
South Yuba River (SD, FE)	From Yuba to Lk Spaulding	D	Open Sep. 1 – Jan. 31
Van Duzen River (SD/FD)	Eel River confluence to headwaters	F	Jul. 1 – Sep. 30

CODES:
(SD) – State designated Wild & Scenic River.
(FD) – Federal designated Wild & Scenic River.
(SD/FD) – Jointly designated state and federal Wild & Scenic River.
(FE) – Identified by a federal agency as eligible for federal designation.
(FL) – Proposed for Wild & Scenic designation or study in pending federal legislation.

Closures Under 1994 Regulations	Open Under 2011 Draft Regulations
Inyo County	Owens River above 3500 feet elevation, NF Bishop, Horton, Pine, and lower Rock Creeks
Marin County	Gallinas, San Clemente, San Rafael Creeks
Mendocino County	Eel River, including main stem, SF, NF, Middle Eel

Mono County	Owens River from Inyo County line to Dry Creek, East Walker River, Buckeye, Desert, Hot, Little Hot, Robinson Creeks
Napa County	Putah Creek upstream of Berryessa Res.
San Benito County	San Benito River and tributaries, except Pacheco Creek
San Luis Obispo County	Estrella River, Cuyama River, Cholame, San Juan, Huasna, Lopez, and other creeks
NF American River>Iowa Hill Bridge (Placer County)	NF American River>Iowa Hill Bridge
Big Chico Creek Manzanita Ave>Higgins Hole	Big Chico Creek (all)
Big Creek (Fresno County)	Big Creek downstream of Huntington Res.
Big Creek (Trinity County)	Big Creek
Chowchilla River upstream of Eastman Lake	Chowchilla River upstream of Eastman Lake
Clavey River (Tuolumne County)	Clavey River below 5,500 feet elevation
Deep Creek (San Bernardino County)	Deep Creek upstream of Holcomb Creek
Dillon Creek (Siskiyou County)	Dillon Creek
Dinkey Creek (Fresno County)	Dinkey Creek downstream of 4,000 feet elevation
Eel River, all forks and tribs in Mendocino County	Eel River and all forks
Horton Creek (Tuolumne County)	Horton Creek
Kaweah River upstream of Kaweah Res. (Tulare County)	Kaweah River below 4,000 feet elevation
NF Kern upstream of Isabella Res. (Kern, Tulare Counties)	NF Kern below 5,000 feet elevation
Kings Rivers Tulare Res>Pine Flat Dam	Kings River below 1,000 feet elevation
Malibu Creek (all) (La County)	Malibu Creek upstream of Rindge Dam
Merced River from San Joaquin River confluence>Crocker-Huffman Dam	Merced River (all)
Pit River (Lassen, Modoc Counties)	Pit River
Sacramento River Box Canyon Dam>SF Bay	Box Canyon Dam to Shasta Reservoir, Tehama County line to SF Bay
San Joaquin River Friant Dam>Delta	San Joaquin River below Friant Dam
San Mateo Creek (San Diego, Orange, Riverside Counties)	San Mateo Creek in Camp Pendleton & San Onofre State Beach
Santa Ana River upstream of Bear Creek (San Bernardino County)	Santa Ana River upstream of Bear Creek
Stanislaus River downstream of Goodwin Dam	Stanislaus River below Goodwin Dam
Trinity River downstream of SF Trinity (Humboldt, Trinity Counties)	Trinity River downstream of SF Trinity confluence
Tuolumne River Waterford Bridge>La Grange Dam (Stanislaus County)	Tuolumne River downstream of La Grange Dam

California Heritage and Wild Trout Waters Open To Suction Dredge Mining Under Draft Regulations			
WATER	DESCRIPTION	CLASS	SEASON
Yellow Creek	Upstream of North Fork Feather in Plumas County	D	Open Jun. 1 – Sep. 30
North/Middle Forks Stony Ck.	In Glenn County	F	Open Jul. 1 – Sep. 30
North/Middle/South Forks, & Main Stem Stony Creek	In Colusa County	D	Open Jul. 1 – Jan 31
Middle Fork Stony Creek	In Lake County	D	Open Jul. 1 – Jan 31
Truckee River	From Trout Creek to Grey Creek in Nevada County	G	Open Sep. 1-30
South Fork Merced River	Below 2,000 feet elevation in Mariposa County	F	Open Jul. 1 – Sep. 30
	From 2,000 feet elevation to Yosemite Park boundary	D	Open Jul. 1 – Jan 31
Merced River	Below 2,000 feet elevation in Mariposa County	F	Open Jul. 1 – Sep. 30
Kings River	Below 4,000 feet elevation in Fresno County	F	Open Jul. 1 – Sep. 30
SF Kings River	Below 4,000 feet elevation in Fresno County	F	Open Jun. 1 – Sep. 30
Sacramento River	Above Shasta Res. in Shasta County	D	Open Jul. 1 – Jan 31

	In Siskiyou County	H	Open All Year
Owens River	Above 3,500 feet elevation in Inyo County	E	Open Sep. 1 – Jan. 31
North Fork American River	Clementine Res. to Big Valley Canyon in Placer County Above Big Valley Canyon in Placer County	G H	Open Sep. 1-30 Open All Year
Rubicon River	Below Hell Hole Res. in El Dorado County Below Hell Hole Res. in Placer County	H E	Open All Year Open Sep. 1 – Jan. 31
Nelson Creek	Upstream of Middle Fork Feather in Plumas County	E	Open Sep. 1 – Jan. 31
Middle Fork Feather River	Upstream of Oroville Res. in Butte & Plumas Counties	D	Open Jul. 1 – Jan 31
Middle Fork Stanislaus River	From 2,000 to 5,500 feet elevation in Tuolumne County Below 2,000 feet elevation In Tuolumne County	D F	Open Jul. 1 – Jan 31 Open Jul. 1 – Sep. 30
Lavezzola Creek	North Fork Yuba tributary in Sierra County	E	Open Sep. 1 – Jan. 31
Hot Creek	Tributary of the Owens River in Inyo County	H	Open All Year
East Carson River	Carson Falls to Nevada State Line in Alpine County	G	Open Sep. 1-30
Deep Creek	Green Valley Ck. to Holcomb Ck. in San Bernardino Cnty.	H	Open All Year
Clavey River	From 2,000 to 5,500 feet elevation in Tuolumne County	D	Open Jul. 1 – Jan 31
Bear Creek	Santa Ana River tributary in San Bernardino County	E	Open Sep. 1 – Jan. 31
South Fork Kern River	1,000-4,000 feet elevation in Tulare County	F	Open Jul. 1 – Sep. 30

Central Valley Steelhead and Salmon Critical Habitat and Reintroduction Areas Open To Suction Dredge Mining Under Draft Regulations			
RIVER	SPECIES	CLASS	SEASON
Antelope Creek in Tehama County	Steelhead & Spring Salmon Critical Habitat	F	Open Jul. 1 – Sep. 30
Battle Creek in Shasta County Battle Creek in Tehama County	Steelhead & Spring Salmon Critical Habitat, Winter Salmon Reintroduction Area Steelhead & Spring Salmon Critical Habitat	F D	Open Jul. 1 – Sep. 30 Open Jul. 1 – Jan. 31
Bear River in Sutter County	Steelhead & Spring Salmon Critical Habitat	C	Open Jun. 1 – Sep. 30
Big Chico Creek in Butte County	Steelhead & Spring Salmon Critical Habitat	C	Open Jun. 1 – Sep. 30
Calaveras River in San Joaquin County	Steelhead Critical Habitat	C	Open Jun. 1 – Sep. 30
Cottonwood Creek in Shasta County Cottonwood Creek in Tehama County	Steelhead & Spring Salmon Critical Habitat Steelhead & Spring Salmon Critical Habitat	F C	Open Jul. 1 – Sep. 30 Open Jun. 1 – Sep. 30
Feather River in Yuba County	Steelhead & Spring Salmon Critical Habitat	C	Open Jun. 1 – Sep. 30
Feather River in Sutter County	Steelhead & Spring Salmon Critical Habitat	A	Closed
Stony Creek in Glenn County	Steelhead Critical Habitat	F	Open Jul. 1 – Sep. 30
Thomes Creek in Tehama County	Steelhead & Spring Salmon Critical Habitat	F	Open Jul. 1 – Sep. 30
Sacramento River above Shasta Res. in Shasta County Sacramento River above Shasta Res. in Siskiyou County	Winter & Spring Salmon & Steelhead Reintroduction Area Winter & Spring Salmon & Steelhead Reintroduction Area	D F	Open Jul. 1 – Jan. 31 Open Jul. 1 – Sep. 30
McCloud River in Shasta County from sec. 32, T38N, R3W to Shasta Res.	Winter & Spring Salmon & Steelhead Reintroduction Area	D	Open Jul. 1 – Jan. 31
North Fork Feather River upstream of East Branch confluence in Plumas County	Spring Salmon Reintroduction Area	H	Open All Year
North Yuba River below Ladies Canyon Creek in Sierra County North Yuba River above Ladies Canyon Creek in Sierra County	Steelhead & Spring Salmon Reintroduction Area Steelhead & Spring Salmon Reintroduction Area	D H	Open Jul. 1 – Jan. 31 Open All Year
Middle Yuba River below Milton Dam in	Steelhead & Spring Salmon Reintroduction	E	Open Sep. 1 – Jan. 31

Sierra, Yuba, & Nevada Counties	Area		
South Yuba River in Nevada County	Steelhead & Spring Salmon Reintroduction Area	D	Open Jul. 1 – Jan. 31
North Fork American River upstream of Folsom Res. to Middle Fork confluence in El Dorado & Placer Counties	Steelhead & Spring Salmon Reintroduction Area	C	Open Jun. 1 – Sep. 30
North Fork American River from Clementine Res. to Big Valley Canyon in Placer County	Steelhead & Spring Salmon Reintroduction Area	G	Open Sep. 1-30
North Fork American River above Big Valley Canyon in Placer County	Steelhead & Spring Salmon Reintroduction Area	H	Open All Year
Middle Fork American River downstream of Oxbow Dam in Placer and El Dorado Counties	Steelhead & Spring Salmon Reintroduction Area	D	Open Jul. 1 – Jan. 31
South Fork American River from Folsom Res. to Slab Creek Dam in El Dorado County	Steelhead & Spring Salmon Reintroduction Area	C	Open Jun. 1 – Sep. 30
South Fork American River from Slab Creek Res. to Riverton in El Dorado County	Steelhead & Spring Salmon Reintroduction Area	E	Open Sep. 1 – Jan. 31
South Fork American River above Riverton in El Dorado County	Steelhead & Spring Salmon Reintroduction Area	C	Open Jun. 1 – Sep. 30
Mokelumne River from Pardee Res. to Hwy 49 in Amador and Calaveras Counties	Steelhead & Spring Salmon Reintroduction Area	D	Open Jul. 1 – Jan. 31
Mokelumne River from Hwy 49 to North/South Forks confluence in Amador and Calaveras Counties	Steelhead & Spring Salmon Reintroduction Area	H	Open All Year
North Fork Mokelumne from South Fork confluence to Tiger Creek Dam in Amador and Calaveras Counties	Steelhead & Spring Salmon Reintroduction Area	H	Open All Year
North Fork Mokelumne from Tiger Creek Res. to Salt Springs Dam in Amador and Calaveras Counties	Steelhead & Spring Salmon Reintroduction Area	E	Open Sep. 1 – Jan. 31
North Fork Stanislaus River upstream of New Melones Res. in Calaveras and Tuolumne Counties	Spring Salmon Reintroduction Area	D	Open Jul. 1 – Jan. 31
Middle Fork Stanislaus River upstream of New Melones Res. in Tuolumne County	Steelhead Reintroduction Area	D	Open Jul. 1 – Jan. 31
Tuolumne River upstream of New Don Pedro Res. to 2,000 feet elevation (near Early Intake) in Tuolumne County	Steelhead & Spring Salmon Reintroduction Area	F	Open Jul. 1 – Sep. 30
Merced River, South Fork Merced River below 2,000 feet in Mariposa County	Steelhead & Spring Salmon Reintroduction Area	F	Open Jul. 1 – Sep. 30
San Joaquin River below Friant Dam in Madera and Fresno Counties	Spring Salmon Reintroduction Area	H	Open All Year

California Red-Legged Frog Critical Habitat Open To Suction Dredge Mining Under Draft Regulations			
UNIT	DESCRIPTION	CLASS	SEASON
BUT-1	Oroville Res. North Fork arm east bank, Chino & Rush Creeks	C	Open Jun. 1 – Sep. 30
YUB-1	Drainages flowing east into Bullards Bar Res., Burnt Bridge & Little Oregon Cks.	C	Open Jun. 1 – Sep. 30
NEV-1	South bank South Yuba River, Rock Creek	E	Open Sep. 1 – Jan. 31
PLA-1	Michigan Bluff area, Poor Man's Canyon, Skunk Creek	H	Open year round
ELD-1	Weber Creek near Pollock Pines	A	Closed
CAL-1	Tributaries to Paloma Creek	C	Open Jun. 1 – Sep. 30
ALA-2	Alameda Creek and tributaries above 300 ft elevation	F	Jul. 1 – Sep. 30
SNB-1	San Benito River west of Paicines	D	Open Jul. 1 – Jan 31
SNB-3	Chalone Creek and San Benito River in and near Pinnacles National Monument	D	Open Jul. 1 – Jan 31
SNB-2	Upper Panoche Creek	D	Open Jul. 1 – Jan 31
STB-1	La Brea Creek (Sisquoc River tributary)	D	Open Jul. 1 – Jan 31
STB-3S	Upper Sisquoc River, Manzana Creek	D	Open Jul. 1 – Jan 31
STB-7	Santa Ynez River between Cachuma Reservoir and Gibralter Dam	H	Open year round

Central Valley Mercury-Impaired Waters Open To Suction Dredge Mining Under Draft Regulations			
WATER	DESCRIPTION	CLASS	SEASON
North Fork American River	North Fork Dam to Folsom Reservoir	C	Open Jun. 1 – Sep. 30
South Fork American River	Slab Creek Dam to Folsom Reservoir	C	Open Jun. 1 – Sep. 30
Lower Bear River	Below Camp Far West Reservoir	C	Open Jul. 1 – Sep. 30
Upper Bear River	Combie Lake to Camp Far West Reservoir	C	Open Jun. 1 – Sep. 30
Big Chico Creek	Butte and Tehama Counties	C	Open Jun. 1 – Sep. 30
Butte Creek	Butte County upstream of Centerville Head Dam Butte County from De Sabla Powerhouse to Bolt Creek	E F	Open Sep. 1 – Jan. 31 Open Jul. 1 – Sep. 30
Cache Creek	Cache Creek Dam to Yolo Bypass	F	Open Jul. 1 – Sep. 30
Lower Calaveras River	Stockton Diversion Channel to San Joaquin River	C	Open Jun. 1 – Sep. 30
Commanche Reservoir	Receives water from the Mokelumne River below Hwy 49 From Hwy 49 to Tiger Creek Dam From Tiger Creek Reservoir to Salt Springs Dam	D H E	Open Jul. 1 – Jan 31 Open All Year Open Sep. 1 – Jan. 31
Camp Far West Reservoir	Receives water from the Bear River	C	Open Jun. 1 – Sep. 30
Combie Lake	Receives water from the Bear River	C	Open Jun. 1 – Sep. 30
Deer Creek (Nevada County)	Deer Creek Reservoir to Lake Wildwood	H	Open year round
Don Pedro Reservoir	Receives water from the Tuolumne River	F	Open Jul. 1 – Sep. 30
East Park Reservoir	Offstream water diversion from Stony Creek From North and Middle Forks in Glenn County From Middle Fork in Lake County From South Fork and Main Stem in Colusa County	 F D D	 Open Jul. 1 – Sep. 30 Open Jul. 1 – Jan. 31 Open Jul. 1 – Jan. 31
Englebright Reservoir	Receives water from the Yuba River North Yuba River in Yuba & Sierra Counties Middle Yuba River in Yuba, Nevada & Sierra Counties South Yuba River from Englebright Res. to Spaulding Dam	 D E D	 Open Jul. 1 – Jan. 31 Open Sep. 1 – Jan. 31 Open Jul. 1 – Jan. 31
Lower Feather River	Oroville Dam to Sacramento River confluence		

	In Yuba County	C	Open Jun. 1 – Sep. 30
North Fork Feather River	Below Lake Almanor in Plumas County	H	Open All Year
Folsom Reservoir	Receives water from the American River		
	North Fork upstream of Folsom Res. to Middle Fork	C	Open Jun. 1 – Sep. 30
	Middle Fork upstream of North Fork to Oxbow Dam	D	Open Jul. 1 – Jan. 31
Hell Hole Reservoir	Receives water from the Rubicon River	E	Open Sep. 1 – Jan. 31
Humbug Creek	Butte County	C	Open Jun. 1 – Sep. 30
Indian Valley Reservoir	Receives water from the North Fork Cache Creek	D	Open Jul. 1 – Jan. 31
Kaweah Reservoir	Receives water from the Kaweah River	F	Open Jul. 1 – Sep. 30
McClure Reservoir	Receives water from the Merced River		
	Above 2,000 feet elevation	D	Open Jul. 1 – Jan. 31
	Below 2,000 feet elevation	F	Open Jul. 1 – Sep. 30
Lower Merced River	McSwain Reservoir to San Joaquin River	F	Open Jul. 1 – Sep. 30
Millerton Reservoir	Receives water form the San Joaquin River	H	Open All Year
Lower Mokelumne River	Below Commanche Dam downstream of Burella Road	C	Open Jun. 1 – Sep. 30
Lake Natoma	Receives water from Folsom Res. and the American River	C	Open Jun. 1 – Sep. 30
New Bullards Bar Reservoir	Receives water from the North Yuba River	D	Open Jul. 1 – Jan. 31
	Receives water from the Middle Yuba River in Yuba, Nevada & Sierra Counties	E	Open Sep. 1 – Jan. 31
New Melones Reservoir	Receives water from the Stanislaus River	F	Open Jul. 1 – Sep. 30
Oroville Reservoir	Receives water from the Feather River	D	Open Jul. 1 – Jan. 31
Oxbow Reservoir	Receives water from the Middle Fork American River	D	Open Jul. 1 – Jan. 31
	Receives water from the Rubicon River	E	Open Sep. 1 – Jan. 31
Pardee Reservoir	Receives water from the Mokelumne River		
	Below Hwy 49	D	Open Jul. 1 – Jan. 31
	Above Hwy 49	H	Open All Year
Pine Flat Reservoir	Receives water from the Kings River	F	Open Jul. 1 – Sep. 30
Putah Creek	Solano Lake to Putah Creek Sinks		
	Putah Creek west of I-505	F	Open Jul. 1 – Sep. 30
	Putah Creek east of I-505	C	Open Jun. 1 – Sep. 30
Rollins Reservoir	Receives water from the Bear River	C	Open Jun. 1 – Sep. 30
San Joaquin River	Bear Creek to Delta	F	Open Jul. 1 – Sep. 30
Scotts Flat Reservoir	Receives water from Deer Creek in Nevada County	H	Open All Year
Shasta Reservoir	Receives water from the Sacramento and McCloud Rivers	D	Open Jul. 1 – Jan. 31
Slab Creek Reservoir	Receives water from the South Fork American River	E	Open Sep. 1 – Jan. 31
Solano Lake	Receives water from Putah Creek	F	Open Jul. 1 – Sep. 30
Lower Stanislaus River	Below New Melones Dam in Stanislaus and Calaveras Counties	C	Open Jun. 1 – Sep. 30
	In Tuolumne County	F	Open Jul. 1 – Sep. 30
Stony Gorge Reservoir	Receives water from Stony Creek in Colusa County	D	Open Jul. 1 – Jan. 31
	In Glenn County	F	Open Jul. 1 – Sep. 30
Tulloch Reservoir	Receives water from the Stanislaus River	F	Open Jul. 1 – Sep. 30
Lower Tuolumne River	Below Don Pedro Dam	C	Open Jun. 1 – Sep. 30
Lake Wildwood	Receives water from Deer Creek in Nevada County	H	Open All Year
Middle Yuba River	Upstream of North Yuba confluence	E	Open Sep. 1 – Jan. 31
North Yuba River	Upstream of Bullards Bar Reservoir	D	Open Jul. 1 – Jan. 31
South Yuba River	Spaulding Reservoir to Englebright Reservoir	D	Open Jul. 1 – Jan. 31

COMMENT # 5 THE DEPARTMENT MUST MITIGATE SIGNIFICANT ADVERSE IMPACTS TO WATER QUALITY AND THE dSEIR MUST INCLUDE A CLEAR STATEMENT FROM THE WATER BOARD DESCRIBING THE ACTIONS THEY WILL UNDERTAKE TO ADDRESS WATER QUALITY IMPACTS, INCLUDING AN ANTIDEGRADATION ANALYSIS.

A CEQA document must provide a sufficient description of the project, its environmental impacts and the mitigation measures that will be adopted to address identified harms. The public and decision-makers must have this information *before* the project is implemented in order to assess all direct and cumulative impacts. Analysis cannot be segmented or postponed to an unspecified future time.

In the present situation, the dSEIR does not explain how significant adverse impacts to water quality will be addressed. Typically, a CEQA document assesses impacts that the lead agency addresses. In the present situation, the State Water Board provided the Department $500,000 to assess water quality impacts caused by suction dredge mining, such as the resuspension and methylization of mercury. However, the dSEIR does not state which agency will address identified significant adverse impacts or what actions will be taken (or not taken).

Instead, the Department denies responsibility to address these impacts. It contends that its authority to regulate suction dredge mining is limited to deleterious impacts on "fish" and, therefore, water quality is beyond its jurisdiction under the Fish and Game Code. The Department's position is confusing, however, since fish cannot survive in water that is of poor quality. At the same time, there is no statement from the Water Board (either the State Board or any of the Regional Boards) regarding specific actions they will take to address the significant impacts to water quality identified in the dSEIR. The dSEIR only states that the Water Board may issue discharge permits in the future.

Meanwhile, no mitigation measures are implemented under the dSEIR or draft regulations, but the public is left with the vague suggestion that these issues may be addressed by the Water Board in the future. Furthermore, the Water Board is required to conduct an antidegradation analysis to ensure that: any degradation is balanced against the interests of the people of the State, that under no circumstances are the minimum standards to protect beneficial uses exceeded, and that best practicable treatment and control measures are implemented.

The protections provided from the antidegradation analysis are consistent with those provided under CEQA (which requires adoption of feasible mitigation measures) and Fish and Game Code §5653 (which requires a determination that no deleterious impacts will occur to fish prior to the issuance of permits). Regardless of the law the assessment of harm and mitigation is conducted under, it is clear that the analysis must occur *before* the activity commences.

Allowing the activity to occur, with the vague possibility that harms may be address in the future is simply not acceptable. While this is true of any program, it is particularly true here. The tribal governments and organizations who submit these comments began addressing the harms that suction dredging cause to fish – and particularly to endangered fish species – in 1997 (and in some instances much earlier). It has taken two lawsuits and a Legislative enactment to force the Department to stop issuing suction dredging permits, even after the Department fully acknowledged the harm being caused to endangered fish in a court of law. Considering how hard-fought any change has been to date, the public cannot accept an environmental assessment that is vague and dismissive on key issues.

Recommendation

The Department must acknowledge its authority to address adverse impacts from suction dredge mining that are identified in the dSEIR, including adverse impacts to water quality that impact fish. The Department cannot study the impacts of water quality from suction dredge mining and then pass the buck to another agency, which cannot be held accountable for findings and statements made during this administrative process.

In addition, the Water Board's intended use of the water quality assessment in the dSEIR must be clearly stated. The Water Board must come forth and state if it intends to issue a permit for suction dredge mining, particularly the type of permit (individual or blanket permits; NPDES permit under section 402 of the Clean Water Act; a Waste Discharge Permit under Porter-Cologne; or a Waste Discharge Permit and 401 State Water Quality Certification, subsequent to the issuance of a 404 dredge permit issued by the Army Corps). The Water Board should also confirm its intention to conduct an antidegradation analysis and an anticipated timeline for the public comment period and adoption of the permit.

Lastly, if the Water Board anticipates reliance on the Department for any aspect of its own permitting program, particularly enforcement, that information must be clearly stated in detail during the public comment period on the Department's draft dSEIR and draft regulations. This information *cannot* be made public after the fact.

COMMENT # 6: THE HYDROLOGY AND WATER QUALITY SECTION FAILS TO ADEQUATELY EVALUATE DELETERIOUS EFFECTS OF RESUSPENDED MERCURY ON FISH

Reasoning

There are two potential pathways in which fish could be exposed to mercury in the aquatic environment. One pathway is direct uptake, methlymercury passing through membranes, from the water column and the second is through feeding on organisms contaminated with mercury; such as macro invertebrates, amphibians, crayfish, mussels and algae. Cumulatively these pathways result in exposure of fish to an extremely

harmful metal, mercury is a known mutagen, teratogen and carcinogen with effects in fish ranging from acute to lethal.

The following except from ***Mercury Hazards To Fish, Wildlife, and Invertebrates: A Synoptic Review***[9] describes the effects detected in mercury poisoned fish:

> *"Signs of acute mercury poisoning in fish included flaring of gill covers, increased frequency of respiratory movements, loss of equilibrium, and sluggishness (Armstrong 1979). Signs of chronic mercury poisoning included emaciation (due to appetite loss), brain lesions, cataracts, diminished response to change in light intensity, inability to capture food, abnormal motor coordination, and various erratic behaviors (Armstrong 1979; Hawryshyn et al. 1982). Mercury residues in severely poisoned fish that died soon thereafter ranged (in mg/kg fresh weight) from 26 to 68 in liver, 16 to 20 in brain, and 5 to 7 in whole body (Armstrong 1979). And at high sublethal concentrations of methylmercury, rainbow trout were listless and darkly pigmented; appetite was reduced, and digestion was poor (Rodgers and Beamish 1982)."*

LC-50 laboratory studies exposing juvenile and embryo-larva rainbow and brook trout to various levels of organic mercury, identified concentrations causing death at the various life stages, see Table 1.

Table 1: LC-50 Studies on Rainbow and Brook Trout

	Effect	*Concentration ug Hg/L medium*	*Reference*
Rainbow trout			
Larva	LC-50 (96 h)	24.0	EPA 1980
Juvenile	LC-50 (96 h)	5.0–42.0	EPA 1980
Brook trout			
Yearling	LC-50 (96 h)	65.0	EPA 1980

Mercury at low concentrations adversely affects freshwater organisms' cycles of reproduction, growth, behavior, metabolism, blood chemistry, osmoregulation and oxygen exchange. Aquatic biota accumulation of mercury is generally rapid while depuration is slow, leading to bioaccumulation. Organomercury (especially methlymercury) compounds are significantly more effective in producing adverse effects and accumulations than inorganic mercury.[7] Generally, mercury accumulation is enhanced with increasing age of the organism and when water quality conditions are

[9] Eisler, Ronald 1987. *Mercury Hazards To Fish, Wildlife, and Invertebrates: A Synoptic Review*. U. S. Fish and Wildlife Service Patuxent Wildlife Research.

such: elevated temperature, reduced salinity/hardness, reduced pH, and presence of zinc, cadmium or selenium.[7]

Water quality conditions in the Klamath River monitored during base flow by the Karuk Tribe Water Quality Program indicate annual elevated temperatures, low conductivity and pH dips characteristic of photorespiration from algal communities.[10] Water quality data collected specifically from Indian Creek detected mercury in the system along with reduced hardness, low levels of pH and increased water temperature.[11] Data collected during base flow overlaps with dredging activities in the Klamath main stem and tributaries.

The SEIR 4.2-52 indicates a single dredger could increase mercury contamination by 10%: "For example, within areas of highly elevated sediment Hg concentrations, a single suction dredge operator using an average size (4 inch) dredge could discharge approximately 10% of the entire watershed Hg loading during a dry year during an average suction dredging time of 160 hours." Given the ideal water quality conditions in the Klamath and its tributaries and the potential for a **single** dredge to discharge 10% of a watershed's mercury load, uptake of mercury by aquatic organisms is likely.

A recent study on the Trinity River, tributary to the Klamath, demonstrated uptake of mercury in larval lamprey ammocoetes and western pearlshell.[12] These are both traditional food sources to the Karuk Tribe; and as with salmonids, the bio-magnification through the food chain presents a health risk to tribal people consuming these foods.

Recommendation

In summary, the water quality conditions documented in the Klamath River and historic use of mercury for gold mining extraction poses a significant impact to fish as well as people. Mining directly for mercury also occurred in the Klamath River basin on the west fork of Beaver Creek, Oak Bar and Empire Creek. Maps of historic gold mines are available and should be used to identify "hot spots". Dredging activities in known and unknown "hot spots" have the potential to re-suspend mercury which is then absorbed by many aquatic species as proven in both the 2010 USGS study *The Effects of Sediment and Mercury Mobilization in the South Yuba River and Humbug Creek Confluence Area, Nevada County, California: Concentrations, Speciation, and Environmental Fate* as well as the 2010 Trinity River report, *A comparison of mercury contamination in mussel and ammocoete filter feeders*. Mercury is not limited to the Yuba River. The Klamath River is another hot-spot as the data from the Trinity River study confirms. The current water quality alternative presented in the DEIS does not remedy suction dredgers mobilizing

[10] Karuk Department of Natural Resources, 2009. Water Quality Report for the Mid-Klamath, Scott and Shasta Rivers: May-Dec 2009.
[11] Karuk Department of Natural Resources, 2001. Karuk Aboriginal Territories Indian Creek and Elk Creek Water Quality Monitoring Report.
[12] Bettaso JB, Goodman DH. 2010. A comparison of mercury contamination in mussel and ammocoete filter feeders. Journal of Fish and Wildlife Management 1(2):142–145; e1944-687X. doi:10.3996/112009-JFWM-019

mercury from unknown hotspots. In order to mitigate for the potential deleterious impacts that can occur to aquatic organisms in known and unknown mercury "hot spots", it is our recommendation that DFG restrict dredging in watersheds with a well-documented history of gold mining.

COMMENT # 7: DSEIR FAILS TO EVALUATE HUMAN HEALTH IMPACTS AND FISH HEALTH IMPACTS RESULTING FROM THE MECHANICAL LYSING OF MICROCYSTIS AERUGINOSA AND RELEASE OF MICROCYSTIN

Reasoning

Dredging occurs at a time when the levels of *microcystis aerugenousa*, and its associated liver toxin microcystin, are elevated to levels requiring public health postings. The cells of the algae are suspended in the water column as it flows downstream to the estuary from its source, the Copco and Iron Gate Reservoirs. When the cells of *microcystis* are lysed or broken, the toxin microcystin is then released into the water column. Dredging operations involve the sucking of the river water through a hose which then pressure pushes the water over a series of angular metal trays to extract the gold. Activities such as these have the potential to lyse the algal cells thereby releasing the toxin.[13] Unlike other water quality impacts associated with dredging activities, release of the toxin is a cumulative addition to the current elevated toxin concentration and does not diminish as it travels further away from the dredge; the toxin thus travels to the ocean.

Elevated toxin levels annually present a threat to public health as well as presenting a stress to salmonids. During the fall of 2010, the Karuk Tribe water quality department collected adult salmonid tissue for analysis of microcystin. The toxin was detected in the livers of one steelhead and four adult Chinook during the sample period.[14] Figure 1 depicts *microcystis* and microcystin sampling results from 2010, as well as highlights the time at which fish were collected with detectable levels of microcystin; sampling locations span the Klamath River below Iron Gate (site code: KRBI) to Orleans (site code: OR).

[13] Kann, Jacob, Personal communication, April 2011.
[14] Kann, Jacob., L.Bowater, G.Johnson and C.Bowman. Technical Memorandum: Preliminary 2010 Microcystin Bioaccumulation Results for Klamath River Salmonids (Updated 4-7-2011).

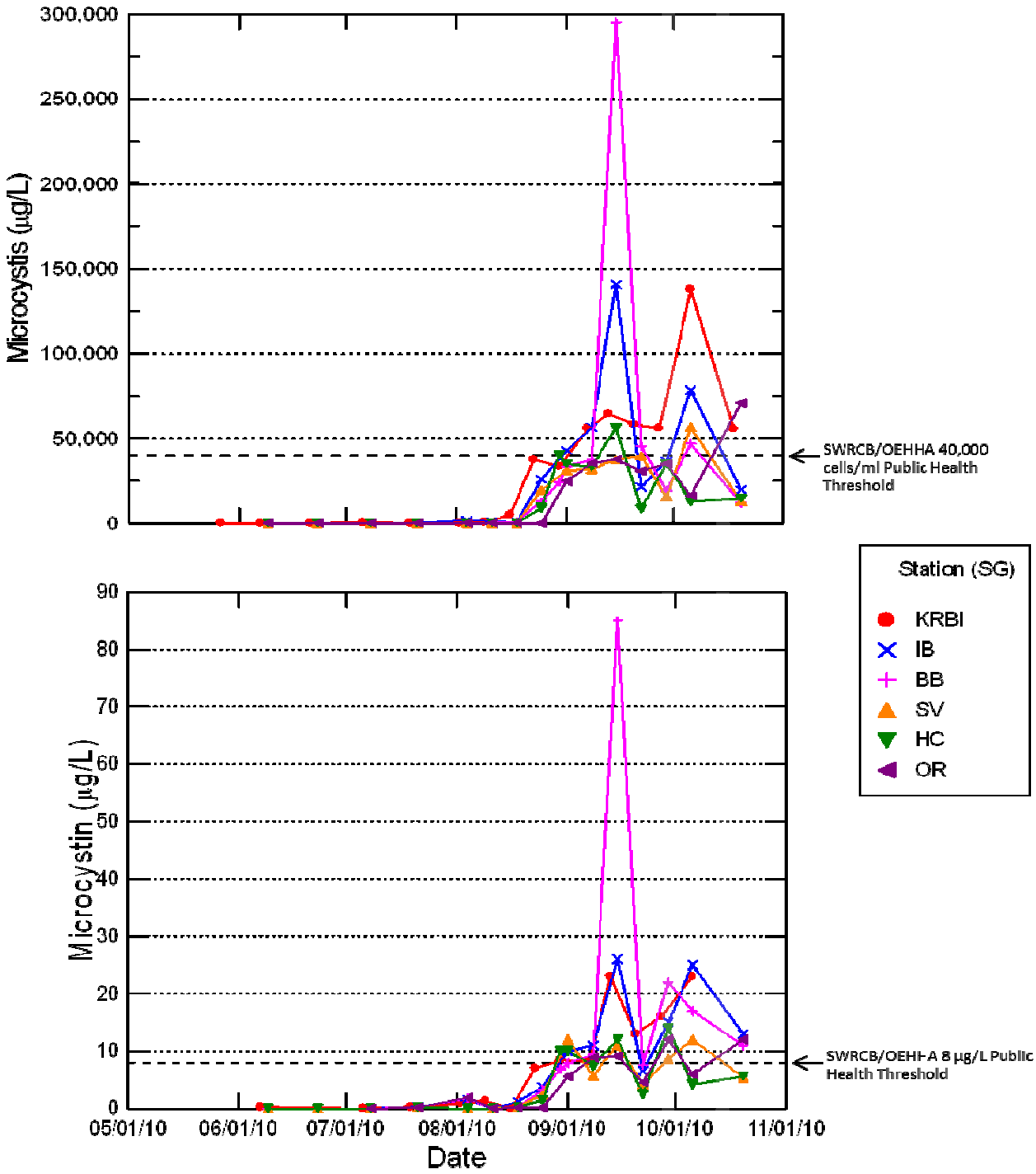

Figure 1: Public Health Sampling 2010 Microcystis and Microcystis Results; shoreline grabs. Shaded vertical lines depict time periods when fish with positive microcystin were collected.

In 2009, the Karuk Tribal Water Quality Department conducted a study to examine the levels of microcystin in fresh water mussel tissue, a traditional food of the Karuk people. Results indicated that ingestion of fresh water mussels in the Klamath River system would result in microcystin doses exceeding various public health thresholds for safe

consumption throughout the summer and fall.[15] Children are most at risk in the months of July, September, and October, when the Acute Tolerable Intake (TI) dose was exceeded by up to ~4 times. This coincides with the time of year that traditional and subsistence use of fresh water mussels occurs; even one meal could exceed safe consumption levels.

Recommendation

In order to avoid the lysing of *microcystis* which thereby increases the concentration of microcystin in the river posing a health threat to people through direct exposure to river water as well as through consumption of mussels, and posing an additional stressor to salmonids; dredging should not occur when microcystis is present in the water column. In 2010, this generally occurred between the months of August and mid-October (Figure 1). In drier years, the bloom may begin as early as July and extend into October[16,17,18]

COMMENT # 8: THE SEIR SHOULD INCLUDE A SECTION ON ENVIRONMENTAL JUSTICE

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.*[19] The affect the Program would have on these uses were not evaluated.

Reasoning

Several California laws require that state agencies, and California EPA in particular, 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."*[20]

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

[15] Kann, J., S. Corum. 2009. Toxigenic Microcystis aeruginosa bloom dynamics and cell density/chlorophyll a relationships with microcystin toxin in the Klamath River, 2005-2008. Technical Memorandum Prepared for the Karuk Tribe of California, May, 2009.
[16] Jacoby, J.M. and J. Kann. 2007. The Occurrence and Response to Toxic Cyanobacteria in the Pacific Northwest, North America. Lake and Reserv. Manage. 23:123-143.
[17] Kann, J., S. Corum. 2010. Middle Klamath River Toxic Cyanobacteria Trends, 2009. Technical Memorandum Prepared for the Karuk Tribe of California, June, 2010.
[18] Kann, J., S. Corum, K.Fetcho 2009. Technical Memorandum: Microcystin Bioaccumulation in Klamath River Freshwater Mussel Tissue: 2009 Results.
[19] http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/090619/Ch_2_PS_090619.pdf
[20] Government Code section 65040.12

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.*[21]

In addition, on December 16, 2010, the United States officially endorsed the United Nations Declaration on the Rights of Indigenous People (DRIP).

Article 19 of the DRIP states:

> *States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.*

It is our view that suction dredge mining under terms of the proposed regulations poses significant threats to water resources, subsistence resources, and leads to negative social and cultural impacts to indigenous groups.

Article 25 of the DRIP states:

> *Indigenous peoples have the right to the lands, territories, and resources which they have traditionally owned, occupied, or otherwise used or acquired…States shall give legal recognition and protection to these lands, territories, and resources…*

Articles within the DRIP are subject to review based on the Human Rights Charter which is supported, endorsed, and enforced by the United States.

Recommendation

We 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.

In addition, the Department should evaluate the consistency of proposed regulation with the United Nations Declaration on the Rights of Indigenous People.

COMMENT # 9: DRAFT SEIR FAILS TO EVALUATE IMPACTS TO PLANTS WITH CULTURAL AND MEDICINAL USES.

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

Reasoning

It is of note that the word 'plant' does not appear in the cultural resources section. The Karuk, as well as many California Tribes, traditionally and contemporarily harvest and utilize a variety of riparian and upland plants for use in traditional basket making as well as for medicinal and other cultural uses. CEQA requires that impacts to these cultural resources be evaluated.

Recommendation

Direct impacts to these specific plant species as well as access to these species by Native American cultural practitioners of should be evaluated in the EIR.

COMMENT #10: EVALUATION OF AESTHETIC IMPACTS LACK QUANTATIVE DATA

Reasoning

The department judges impacts to aesthetic values to be less than significant given the limited time frame that dredging could take place, limited number of dredges statewide (4,000), and assertion that most dredges are hidden from view sheds.

Commenters assert that dredges tend to be concentrated in areas that serve a larger community of hikers, swimmers, recreational and commercial rafters and kayakers.

The Department states in the dSEIR, "the relatively short percentage of the year that dredging activities would be occurring, adverse visual effects are not considered substantial in the statewide context of the Proposed Program."

However, it should be noted that the relatively short time of year that dredging would be occurring is also the relatively short time of year that most people hike, bike, raft, and swim - i.e. summer.

Recommendation

Use quantitative metrics such as user surveys to actually study the aesthetics issue. Compare popular mining areas to popular hiking, swimming, fishing, rafting, and boating areas and compare the time of year each activity uses the given area.

COMMENT # 11: THE INITIAL PLAN FAILS TO ADEQUATELY ASSESS THE IMPACT ON RECREATIONAL AND COMMERICAL BOATING

Reasoning

The placement of dredges, as well as transport of equipment across streams, often requires miners to set static cables and/or ropes across rivers. These cables and ropes can constitute a significant hazard to rafters, canoeists, and kayakers.

Recommendation

Use quantitative metrics such as user surveys to actually study the impact on recreational boating. Compare and cross reference locations of popular mining areas to popular commercial and non-commercial rafting and kayaking runs to identify user conflicts. Develop regulations that preclude stream-wide cables to secure dredges in place which could pose a hazardous entrapment for recreational boaters.

COMMENT 12 –THE DEPARTMENT USED THE US FISH AND WILDLIFE SERVICES'S *PACIFIC LAMPREY CONSERVATION INITIATIVE BEST MANAGEMENT PRACTICES* AS A GUIDE FOR ESTABLISHING FISHING LIMITS ON LAMPREY. THE DEPARTMENT SHOULD REFER TO THIS SAME DOCUMENT FOR PURPOSES OF SETTING LIMITATION ON DREDGE MINING.

Reasoning

The 2010 California Department of Fish and Game Hunting and Sport Fishing Regulations established a 5 fish bag limit in lamprey for the first time in California history. In deciding on this rule change, the Fish and Game Commission considered the US Fish and Wildlife Service's Best Management Practices (BMP's) for Lamprey:

> *"The Department proposes to establish a bag limit of 5 for Pacific Lamprey within state waters. Pacific Lamprey stocks are depressed throughout much of its west coast range. The Pacific Lamprey Conservation Initiative is an effort presently led by the U.S. Fish and Wildlife Service (FWS) to facilitate communication and coordination relative to the conservation of Pacific lampreys throughout their range. The goal of the initiative is to develop a Pacific Lamprey Conservation Plan that will lead to restored Pacific lamprey populations and improvement of their habitat. This initiative is addressing the consideration of Pacific Lamprey when implementing in stream activities, mercury contamination and bioaccumulation, spawning characteristics, biological and ecological needs, and threats. Department staff are part of this conservation initiative. The department proposed to establish California bag limits similar to others west coast states as a reasonable management measure.* [22]*"*

[22] State of California Fish and Game Commission Amended Initial Statement for Reasons for Regulatory Action, August 29 2010, **http://www.fgc.ca.gov/regulations/new/2009/5_00isor2.pdf**

Although the BMP's do not offer any specific recommendations on fishing regulations, the document does describe dredging impacts to lamprey:

> *"Ammocoetes spend most of their time burrowed in stream substrates, moving during flow events and mostly at night. Many age classes can concentrate together in the same areas because of habitat preference, making ammocoete populations particularly susceptible to activities that involve dredging/excavating, stranding and use of toxic chemicals...Dredging from construction, channel maintenance and mining activities can impact all age classes of ammocoetes. Removal of substrate with a backhoe or trackhoe could remove several hundred lamprey per bucket load.*[23]*"*

The document also recommends restricting dredging in lamprey habitat:

> *"Instream channel reconstruction, re-routing,* ***dredging****, and other activities that disturb or remove substrate materials may result in ammocoetes being trapped or killed.*
>
> *• Ammocoetes burrowed in the substrate can and will move if disturbed but are very susceptible to being trapped given their reluctance to move and propensity to avoid light;*
> *•* ***Timing restrictions do not address this risk of direct mortality****.*
>
> *Recommendations:*
>
> *•* ***Avoid these activities where ammocoetes are known to exist****. Where this is not possible, salvage efforts using methods outlined in Attachment A should be attempted prior to activity* (bold emphasis added)*"*
> *• Sift through the removed substrate and salvage any ammocoetes within and return them to the stream away from the construction activity.* (emphasis added)[24]**"**

Recommendation

The Department should comply with the recommendations of the US Fish and Wildlife Services' *Pacific Lamprey Conservation Initiative Best Management Practices* when drafting suction dredge mining regulations.

COMMENT # 13 CONTRARY TO WHAT IS STATED IN THE SEIR (4.3 25,29,31; IMPACT BIO-FISH-2; IMPACT BIO-FISH-4), SUCTION DREDGING

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[23] Best Management Practices to Minimize Adverse Effects to Pacific Lamprey, p. 11, http://www.fws.gov/pacific/Fisheries/sp_habcon/Lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf

[24] Ibid. p. 19

WOULD HAVE SIGNIFICANT IMPACTS ON JUVENILE LAMPREY (AMMOCOETES) AND MUSSELS BECAUSE THEY WOULD LIKELY SUFFER HIGH RATES OF MORTALITY WHEN EXCAVATED FROM THE SUBSTRATE.

Reasoning

The SEIR (4.3-24 lines 9-12) acknowledges the vulnerability of lamprey ammocoetes because "unlike salmonids, lamprey larvae may also emerge from the redd and find backwater or low gradient areas of sand and silt to continue development for up to seven years, filtering substrates to feed on detritus (Moyle, 2002). Therefore, for lamprey, many areas of the channel may be considered sensitive to disturbance." (emphasis added) Despite the acknowledgement that lamprey are unlike salmon because they would remain sensitive to channel disturbance from dredging, the DEPARTMENT erred by categorizing them as "other fish species" (Table 4.3-2 p.12) and provided no life history data in Appendix K. Figure 1 (below) provides illustrations of basic life history for this very important fish. Classifying lamprey as "other fish species" was also inappropriate because "surrogate protection" designed for free swimming juvenile salmon species would not protect juvenile lamprey that reside immediately below the stream substrate (Fig.1). Rather than seeking effective ways to protect lamprey ammocoetes from suction dredging, the SEIR falsely states that "[r]esidual impacts including disturbance of ammocoetes, not likely to result in deleterious effect to species." The SEIR provides no data or analysis to support this statement. This conclusion is arbitrary and not supported by what is known about lamprey species.

Lamprey may be at extremely low numbers in some stream systems. Moyle states that "lampreys are still present in most of their native areas, but large runs that once characterized streams such as the Eel River seem to have largely disappeared. Certainly the once-common 'great wriggling masses' are rarely seen. Unfortunately, little attention has been paid to lamprey, and there is only anecdotal evidence (mainly from Native American fishermen) that runs in North Coast streams are much smaller than they used to be.[25]"

Lampreys have only a 3%-26% survival rate when passed through a dredge.[26] Ammocoetes that survived entrainment would likely suffer high rates of predation (Harvey and Lisle 1998:9). The U.S. Fish and Wildlife Service[27,28,29] report that many

[25] Moyle, P. B. 2002. Inland Fishes of California. Revised and expanded. University of California Press. Berkley, CA.: 502 pp.

[26] Beamish, R.J. and J.H. Youson. 1987. Life history and abundance of young adult *Lampretra ayresi* in the Fraser River and their possible impact on salmon and herring stocks in the Strait of Georgia. Can. J. Fish and Aquatic Sci. 44: 525-537

[27] USFWS (US Fish and Wildlife Service). 2008a. Fact Sheet Pacific Lamprey. http://www.fws.gov/oregonFWO/Species/Data/PacificLamprey/Documents/012808PL-FactSheet.pdf

age classes of Pacific lamprey ammocoetes can be impacted by mining or dredging activities. As an example, suction-dredge mining is thought to be one of the reasons for the loss of lamprey in the upper John Day River basin in Oregon.

Similar to lamprey species, mussel species are vulnerable to dredging because they would likely die from being buried in tailings (SEIR 4.3-26). Once again the Department erred by placing mussel species in the "other fish species" even though there is no surrogate protection from other "action species" and they have a high potential for deleterious effect. The SEIR (4.3-28 lines27-43 and 4.3-29 lines 1-2) asserts that five regulations would minimize burial or displacement of mussels and further state that "the amount of burial of mollusks that is likely to occur is also considered less than significant based on the restriction on dredging in mussel beds, and the historical and projected level of suction dredging activity."

The less than significant determination is based in part on the false statement that "Section 228(k)(13): prohibits dredging in mussel beds" (SEIR 4.3-28 line 33). Section 228(k)(13) actually only limits protection to mussel beds that have a density of 40 or more mussels per square yard (SEIR 2-21 lines 28-32). This regulation is likely to be ignored by dredgers because it would be nearly impossible to comply with and even more problematic to enforce. The less than significant determination is also based in part on the false statement that Section 228(k)(16): requires dredgers to avoid the disturbance of eggs, redds, tadpoles and mollusks. Mollusks are not mentioned in 228(k)(16) as written in SEIR 2-22. It appears that various wordings of regulations were arbitrarily developed so as to provide some plausible rationale for a "less than significant" determination for mussels.

The less than significant determination is based in part on "historical and projected level of suction dredging activity." No analysis accompanies this statement. Based on the information provided in the SEIR about mussels a "significant impact" determination would also be justified if "historic and projected level of suction dredging would continue."

Lamprey ammocoetes, mussels and other filter feeders function at a community level. Impacts to the functioning of this community cannot be dismissed with "less than significant impacts" to individual species or species groups. Reductions of the filter feeding community would have undesirable trophic consequences. Productivity of streams would be reduced as excessive organic detritus (nitrogen and phosphorus) would pollute rather than be captured in organisms' bodies. The SEIR (Figure 4.3-2) failed to

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[28] USFWS (USFWS) 2008b. Draft Outline of the Pacific Lamprey Conservation Plan. http://www.fws.gov/pacific/fisheries/sp_habcon/lamprey/pdf/Pacific%20Lamprey%20Conservation%20Initiative%20ver%20060809.pdf (Accessed 4/15/2010)

[29] USFWS (US Fish and Wildlife Service). 2009. Proceedings of the Pacific Lamprey Conservation Initiative Work Session. Available at http://www.fws.gov/columbiariver/publications/Lamprey_Conservation_Proceedings_Final_09.pdf

take a hard look at dredging impacts to filter feeding communities except for how mercury bioaccumulates.

Recommendation

Undertake a more thorough evaluation of the impacts to lamprey ammocoetes, mussels, and other filter feeders.

COMMENT # 14: PROPOSED REGULATIONS VIOLATE KLAMATH BASIN PLAN AND EXISTING STATE LAW

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.

Although the Department did propose significant dredging restrictions in Klamath River cold water refugia, it failed to propose restrictions wholly consistent with the restrictions mandated by the Klamath TMDLs. The Porter-Cologne Act requires State Agencies to comply with State Water Quality standards:

> ***§ 13146. State agency compliance***
> *State offices, departments and boards, in carrying out activities which affect water quality, shall comply with state policy for water quality control unless otherwise directed or authorized by statute, in which case they shall indicate to the state board in writing their authority for not complying with such policy.*

Specifically, the refugial areas identified in the TMDL not identified in the Department's proposed regulations are:

- Canyon Creek (Siskiyou county)
- Cottonwood (Siskiyou county)
- Little Horse Creek (Siskiyou county)
- West Grider Creek (Siskiyou county)

The following creeks have a 1500 foot thermal protection zone in TMDLs but only 500 foot protection zone in proposed Regulations:

- Aubry Creek (Siskiyou County)
- Clear Creek (Siskiyou County)
- Dillon Creek (Siskiyou County)
- Elk Creek (Siskiyou County)
- Grider Creek (Siskiyou County)

- Horse Creek (Siskiyou County)
- Indian Creek (Siskiyou County)
- Rock Creek (Siskiyou County)
- Swillup Creek (Siskiyou County)
- Ukonom Creek (Siskiyou County)

Additional Creeks have additional in stream restrictions on dredging described in the TMDLs that are not reflected in proposed DFG regulations. A full comparison between proposed DFG regulations and restrictions on dredging included in the TMDLs can be seen in the following table:

Klamath River Tributaries	**Refugia Protection proposed by DFG**	**Refugia Protection Provided by TMDL**
Aubrey Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Beaver Creek	500 ft radius	1500 + 3000 feet up the Creek
Canyon Creek	0	500 ft radius
Cottonwood Creek	0	500 ft radius
Clear Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Dillon Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Elk Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Empire Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Fort Goff Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Grider Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Horse Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Indian Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Jenny Creek	0	500 ft radius
King Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Little Horse Creek	0	500 ft radius + 3000 feet up the creek
Little Humbug Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Mill Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Nantucket Creek	500 ft radius	500 ft radius + 3000 feet up the creek
O'Neil Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Portuguese Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Reynolds Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Rock Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Sandy Bar Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Seiad Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Stanshaw Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Swillup Creek	500 ft radius	1500 ft radius + 3000 feet up the Creek
Ti Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Titus Creek	500 ft radius	500 ft radius + 3000 feet up the creek
Ukonom Creek	500 ft radius	1500 ft radius
West Grider Creek	0	500 ft radius
Scott River Tributaries		
Boulder Creek	none	500 ft radius
Canyon Creek	none	500 ft radius
Kelsey Creek	none	500 ft radius

Recommendation

Dredge mining regulations should not be inconsistent with California water quality laws such as the Klamath Basin Plan, or any other state or federal river management plans.

COMMENT # 15: PROPOSED REGULATIONS FAIL TO PROTECT HABITATS AGREED TO IN THE DFG/KARUK PROPOSED SETTLEMENT AGREEMENT

In 2005 the Karuk Tribe filed litigation against the Department alleging that suction dredge mining regulations were insufficient to protect fish. Shortly thereafter, the Department and the Tribe negotiated mining restrictions in the Klamath Basin that the Department agreed achieved the statutory standard of "not deleterious to fish."

This agreement was based on the consideration of data exchanged between the Tribe and the Department. The data established that the impact of suction dredge mining in these waters would cause deleterious impacts to endangered and special status fish species, including the Coho salmon. That reasoning and data were described in the concurrently filed declaration of Dr. Peter Moyle, fisheries biologist and professor in the Department of Wildlife, Fish, and Conservation Biology at the University of California at Davis, and Associate Director of its Center for Watershed Science. Some of Dr. Moyle's studies were reviewed by the Department in drafting the dSEIR and draft regulations (included in the Literature Review).

Dr. Moyle testified as follows:

"The general effects of suction dredging on fish are well described in Harvey (1986) and Harvey and Lisle (1998) and so will be described only briefly here. The effects vary according to a variety of factors including size of stream, fish species present, season of dredging, and frequency and intensity of dredging. The key is that suction dredging represents a chronic unnatural disturbance of natural habitats that are already likely to be stressed by other factors and can therefore have a negative impact on fishes that use the reach being dredged. Direct effects include entrainment of invertebrates and small fish in the dredges, altering of the habitat that supports the food supply of fishes, and changing channel structure in ways that make it less favorable for fish (usually by making it less stable and complex). An area of particular concern in the Klamath, Salmon and Scott Rivers and their tributaries is the creation of piles of dredge tailings that are attractive for the spawning of salmonids but that are so unstable they are likely to scour under high flows, greatly reducing survival of the embryos placed within the gravel.

"A more immediate effect is the impact of chronic disturbance of the fishes, which can change their behavior and cause them to move to less favorable conditions. I am particularly concerned in this regard with dredging in or near thermal refugia of juvenile salmonids. As discussed in the NRC (2003) report and references therein, the Klamath River and some of its tributaries can reach temperatures in excess of 65-70ºF during the

day in late summer. Such temperatures are very stressful or even lethal for many salmonids, so the fish seek out cooler areas, where small tributaries flow into the river or there is upwelling of ground water. Juvenile Coho salmon, Chinook salmon, and steelhead will often be packed into these areas during the day. This past August, I spent a day with Dr. Michael Deas, who was documenting the nature of a thermal refuge created by the inflow of single creek into the Klamath River. When I swam through the refuge area with a mask and snorkel I was impressed with the concentrations of fish in the area (and the lack of them in the main river) and how much even a minor disturbance of the habitat would reduce the ability of the area to support fish.

"Adult salmon and steelhead can also be disturbed by the intense dredging activities. I am particularly concerned with spring-run Chinook salmon, a species with which I have worked closely in the Sacramento River drainage. Adult spring-run Chinook spend the summer in pools in rivers, especially the Salmon River (and its forks) and Wooley Creek. They have to survive the summer without feeding, using reserves of fats and oils they bring up from the ocean. Chronic disturbance of the type created by dredging and dredgers can increase stress on these fish and has the potential to reduce their over-summer survival. An often overlooked impact of dredging is that the people involved often live on or close to the stream in remote areas for weeks at a time, where they not only dredge, but swim, bathe, and fish (sometimes illegally). Such activity can cause spring-run Chinook to use up precious energy reserves if they have to move to less favorable areas or swim about avoiding people.

"It is important to note that the Klamath River and its tributaries support the highest diversity of anadromous fishes of any river in California including: Coho salmon, chum salmon, multiple runs of Chinook salmon, coastal cutthroat trout, multiple runs of steelhead, eulachon, green sturgeon, white sturgeon, Pacific lamprey, and river lamprey. This is the reason, of course, why the river also supported a rich and diverse fishery by the native peoples who live along the river. Today virtually all the species are in decline or threatened with declines from multiple factors (see NRC 2003). Therefore, in my professional opinion, suction dredging should only be allowed in areas where it can be demonstrated there will no immediate or cumulative impact on the anadromous fishes. It should be assumed there is harm, unless it can be proven otherwise. One reason for my taking this conservative position is that we simply do not know the effects of dredging on many species, especially when the intensity of dredging is increasing. For example, the larvae (ammocoetes) of Pacific and river lamprey live in soft materials along the stream edge or in slow-moving sections of stream. Dredging of areas where ammocoetes are abundant will push them into the water column where they can be readily consumed by predators, contributing further to the likely declines of the species. Even for salmonids, information on the effects of dredging, with the exception of a few studies such as that of Harvey (1989), is largely anecdotal or in non-peer reviewed reports (see, for example, the bibliography of DFG 1994). Studies are also largely confined to looking at immediate effects of single dredges and they do not examine the cumulative or long-term effects of multiple dredges and activities associated with the dredges. Indeed little has changed since DFG (1994, p. 71) listed the need for additional studies on practically every

important aspect of the environmental impacts of dredging. Harvey and Lisle (1998) present a strategy for acquiring much of the needed information.

"The NRC (2003) report emphasized two important considerations for the recovery of Klamath basin fishes that are especially relevant here: (1) cold water refuges are key to the persistence of many species, especially Coho salmon and (2) the entire array of anadromous fishes (i.e., the Tribal Trust Species) need large scale and pro-active measures to assure recovery. Suction dredging is one more insult to these fishes that is likely to hurt their chances for recovery. In particular, Coho salmon, spring-run Chinook salmon, and summer (spring) steelhead are particularly vulnerable to the immediate effects of dredging and have been reduced to low numbers in the Klamath Basin so need special protection."

However, the newly proposed regulations allow suction dredge mining, contrary to the data and reasoning agreed upon in 2005 and as described above by Dr. Moyle. For most of the river segments, the proposed regulations extend the season deeper into the fall. For the Salmon and Scott, all tributaries where mining would have been banned in the proposed settlement are open to dredging in the proposed regulations.

The Department agreed that a ban on dredging in the following tributaries were necessary to avoid a deleterious impact on fish in the proposed Karuk Settlement:

Salmon River tributaries
Butler
East Fork of Knownothing
Indian
Kelly Gulch
Knownothing
Little N. Fork
Methodist
Negro
Nordheimer
North Fork
South Fork
Specimen
Wooley

Scott River Tributaries
E. F. Big Mill
SF Boulder
Canyon
Etna
French
Kangaroo
Kelsy
Kidder
McAdam
Mill (Scott Bar)
Mill (aka Shackleford/Mill)

Moffett
Patterson
Shackleford
SF Scott
Suger
Tompkins
Wildcat
Wooliver

In addition, the dredging season in the main-stem Salmon was banned from the mouth to Forks of Salmon and the season was 15 days shorter in the main-stem Klamath.

Recommendation

The Department should explain in detail why it no longer judges dredging in these tributaries to be deleterious to fish as it once did. In addition, the Department should explain in detail why the Department decided to change its policy position established in the proposed Karuk settlement such that dredging from September 15 to September 30 in the main-stem Klamath no longer causes deleterious impacts to fish.

COMMENT # 16: PROTECTING COHO FROM DELETERIOUS EFFECTS OF DREDGES MEANS PROTECTING BEAVER FROM DELETERIOUS EFFECTS OF DREDGES

Recent data suggest that a critical step in restoring Coho salmon is the restoration of beaver and beaver habitat (http://www.surcp.org/beavers/conference.html). Indeed, recent surveys of beaver bonds in the Klamath Basin reveal improved juvenile rearing populations of Coho in areas flooded by beaver ponds (Toz Soto, Will Harling, personal communication).

Recommendation

Ban dredges where established or suitable beaver habitat coincides with that of Coho salmon.

COMMENT # 17: EVALUATE RISK TO PUBLIC CREATED BY HIDDEN UNDERWATER PITS EXCAVATED BY DREDGERS

Reasoning

Dredging often leaves behind deep under water pits excavated by the dredge. Although the draft regulations require dredgers to fill in pits, this rule will not likely address this concern. The material excavated from the pit often washes downstream and is therefore not available to put back in the pit. Furthermore, commenters assert that it is highly unlikely that unsupervised miners would make the effort to fill in the pits and the Department lacks the manpower and resources to properly enforce this provision.

Video footage of the pits, some as much as six feet deep, can be viewed online at: http://www.youtube.com/watch?v=PJYyT2U3iAg

These holes create deathtraps for unsuspecting swimmers and children playing in what were previously shallow pools.

Recommendation

Ban dredging in any areas used by swimmers.

COMMENT # 18: THE FEBRUARY 11, 2011 DECISION BY THE NATIONAL MARINE FISHERIES SERVICE TO CONDUCT AN ENDANGERED SPECIES ACT STATUS REVIEW OF UPPER KLAMATH AND TRINITY RIVERS ESU CHINOOK (NATIONAL MARINES FISHERIES SERVICE 2011) AND THEIR INTERIM DESIGNATION AS A CANDIDATE SPECIES REPRESENTS A SIGNIFICANT CHANGE SINCE THE SEIR WAS WRITTEN AND SHOULD TRIGGER A MORE THOROUGH EVALUATION OF THE PROGRAM'S IMPACTS TO KLAMATH-TRINITY RIVERS (KTR) CHINOOK AND, IN PARTICULAR, KTR *SPRING-RUN* CHINOOK.

Reasoning

A primary reason for the re-evaluation of CDFG's suction dredge permitting program at this time stems from the Department's failure to update the 1994 suction dredge regulations after the SONCC Coho was federally listed as "threatened" in 1997. The recent declaration of Upper Klamath and Trinity Rivers ESU Chinook as a federal ESA Candidate Species as defined by 50 CFR 424.02(b) underscores the fact that KTR Chinook meet the criteria for consideration as an endangered or threatened species for the purposes of a CEQA analysis pursuant to CA Title 14 Sec. 15380(d). The very fact that NMFS is now evaluating Klamath-Trinity Chinook for addition to the federal listing indicates that this species *may* be "threatened" as that term is used in the Federal Endangered Species Act[30] (see SEIR 4.3-5 lines 3-16).

Recommendation

The Department should proceed from this point with the assumption that Upper Klamath and Trinity Rivers ESU Chinook (inclusive of KTR spring-run Chinook) will be federally listed so that the proposed program's CEQA analysis and subsequent regulations will not be out-of-date and/or out of compliance should Upper Klamath and Trinity Rivers ESU Chinook be federally listed on or before the statutory deadline of January 28, 2012 for NMFS to issue their listing decision. Table 4.3-1 ("Action Species") should be updated to

[30] National Marine Fisheries Service. 2011. Listing Endangered and Threatened Species; 90-Day Finding on a Petition To List Chinook Salmon, Federal Register (Proposed Rules), 76: 70 (April 12, 2011) p. 20302 http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-20302.pdf, accessed 4/25/11.

show Upper Klamath and Trinity Rivers ESU Chinook as a federal Endangered Species Act Candidate Species as defined in 50 CFR 424.02(b).

COMMENT # 19: THE SEIR INCORRECTLY ASSUMES THAT SALMON RIVER'S DISTINCT METAPOPULATION OF KTR SPRING-RUN CHINOOK IS NOT LIMITED ENOUGH IN NUMBER OR GEOGRAPHIC DISTRIBUTION TO WARRANT CONSIDERATION OF IMPACTS TO INDIVIDUAL FISH AS POTENTIALLY AFFECTING THE SPECIES AT THE POPULATION- AND RANGE-LEVEL.

Reasoning

The SEIR on p. 4.3-23 line 26, states that:

> *"CDFG did not consider impacts to individual members of a population to be significant, unless the species was extremely rare. While a more conservative approach was contemplated, it was determined to be inappropriate because it would not be an effect that would be considered "substantial," especially given the statewide scope of the Proposed Program. For these reasons, the analysis focuses instead on population- and range-level effects."*

Thirty years of Salmon River spring-run Chinook census population surveys between 1980 and 2010 provide unequivocal evidence that this species is, in fact, rare and very limited in distribution. Total census population numbers of adult spring Chinook in the Salmon River have ranged between 78 and 1,304 individuals with a 30-year median census population of 466 adults[31].

Further underscoring the significance of these low numbers, Nehlsen et al. (1991)[32] point out that, for wild stock, *effective population* size may be one-half of the *census population* because "the effective population size is defined as one in which each spawner contributes equally to the subsequent generation (which requires equal sex ratios and equal spawning success among all individuals)." Using the ratio of effective population = ½ census population, the Salmon River spring-run Chinook has a 30-year median *effective population* of 233 fish (and a low of 39 fish and a high of 652 fish).

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[31] Salmon River Restoration Council. 2010. Spring Chinook Summer Steelhead Survey Results 1980-2010 (Excel spreadsheet). http://www.srrc.org/publications/programs/fisheries/SRRC%20Spring%20Chinook%20Summer%20Steelhead%20Survey%20Results%201980-2010.xls, accessed 4/25/11.

[32] Nehlsen, W., J.E. Williams, and J.A. Lichatowich. 1991. Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington. Fisheries, Vol. 16, No. 2. pps 4-21. http://www.krisweb.com/krisrussian/krisdb/html/krisweb/biblio/gen_afs_nehlsenetal_1991.pdf, accessed 4/25/11.

Effective populations of more than 500 fish may be necessary to reduce a stock's vulnerability to environmental stochasticity,[33] and the Salmon River KTR spring-run Chinook have a median effective population far below this threshold (as well as a median census population also below this threshold). Elder et al. (2002)[34] concluded that Salmon River spring-run Chinook escapement is low enough to place the population at elevated risk of significant mortality due to stochastic events in many years.[35] Nehlsen et al. (1991) classify the greater Klamath River spring-run Chinook as being at "high risk of extinction."

Given these critical numbers, any additional stress to Salmon River KTR spring-run Chinook—including impacts to individual fish, holding habitat, or spawning substrate, etc.—can be conservatively estimated to be likely to adversely affect the run at a population- or range-level and pose deleterious effects to these fish. It is significant to note the main areas of summer holding habitat coincide with areas most commonly dredged in the Salmon River watershed, and CDFG has identified the entire range of KTR spring-run Chinook as receiving moderate to high suction dredging activity (SEIR Appendix F).

The Salmon River's KTR spring-run Chinook are a distinct wild metapopulation, distinct from the Trinity River's hatchery-influenced stock. In fact, the Salmon River's stock is the largest wild run of spring Chinook in the entire Klamath River system[36] and one of the last in California[37]. The Klamath River Basin Stock Identification Committee of the Klamath River Basin Fisheries Task Force identified the Salmon River spring-run Chinook as a distinct metapopulation.[38] Fin-clipped Trinity River hatchery spring-run Chinook have never been found in the Salmon River (Peter Brucker, personal

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[33] Nehlsen, W., J.E. Williams, and J.A. Lichatowich. 1991. Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington. Fisheries, Vol. 16, No. 2. pps 4-21. http://www.krisweb.com/krisrussian/krisdb/html/krisweb/biblio/gen_afs_nehlsenetal_1991.pdf, accessed 4/25/11

[34] Elder, D., B. Olson, A. Olson, J. Villeponteaux, and P. Brucker. 2002. Salmon River Sub-basin Restoration Strategy: Steps to Recovery and Conservation of Aquatic Resources. Report for Klamath River Basin Fisheries Restoration Task Force, IA Agreement No. 14-48-11333-98-H019: 52 pp. http://www.srrc.org/publications/general/SRRC%20Salmon%20River%20Subbasin%20Restoration%20Strategy.pdf, accessed 4/25/11.

[35] Nehlsen, W., J.E. Williams, and J.A. Lichatowich. 1991. Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington. Fisheries, Vol. 16, No. 2. pps 4-21. http://www.krisweb.com/krisrussian/krisdb/html/krisweb/biblio/gen_afs_nehlsenetal_1991.pdf, accessed 4/25/11.

[36] West, J.R., O.J. Dix, A.D. Olson, M.V. Anderson, S.A. Fox, and J.H. Power. 1992. Evaluation of Fish Habitat Conditions and Utilization in Salmon, Scott, Shasta, and Mid-Klamath Sub- Basin Tributaries 1989-1991. U.S. Department of Agriculture Forest Service. Klamath National Forest. Yreka, CA. http://www.fws.gov/yreka/Final-Reports/rmaap/1990-FP-2.21-KNF.pdf, accessed 4/25/11.

[37] Moyle, P. B. 2002. Inland Fishes of California. Revised and expanded. University of California Press. Berkley, CA.: 502 pp.

[38] Barnhart, R. A. 1994. Salmon and steelhead populations of the Klamath-Trinity Basin, California. pp. 73-97 In: T. J. Hassler (ed.) Klamath Basin Fisheries Symposium. Humboldt State University. Arcata, CA.

communication, April 2011),[39] suggesting that there is no crossover between the Salmon River and Trinity River spring-run Chinook.

Additionally, although the proposed program would operate statewide, basing the determination of whether an impact is "substantial" on the statewide scale is inappropriate for a species of very limited population and limited geographic distribution, such as KTR spring-run Chinook. More appropriate for KTR spring-run Chinook on the Salmon River would be to analyze impacts on a geographic scale defined by the boundaries of a recognized distinct metapopulation for the species and on individual members of the population since, with a median annual census population of 466 adults, impacts to individual Salmon River KTR spring-run Chinook can be reasonably assumed to have an impact on the remarkably small Salmon River population as a whole.

Recommendation

The SEIR should more comprehensively analyze impacts to Salmon River's metapopulation of KTR spring-run Chinook including impacts to individuals as they relate to population- and range-level impacts.

COMMENT #20: THE PROPOSED SPATIAL AND TEMPORAL RESTRICTIONS DO NOT AVOID THE ADVERSE IMPACTS IDENTIFIED IN IMPACT-BIO-FISH-1 FOR SALMON RIVER KTR SPRING-RUN CHINOOK

Reasoning

The SEIR purports that potentially significant adverse impacts to fish (Impact BIO-FISH-1) are avoided by spatial and temporal restrictions on dredging (SEIR 4.3-24):

> *"If left unrestricted, impacts of suction dredging on spawning of Fish would be potentially significant with respect to Significance Criteria A and D. However, the Proposed Program incorporates spatial and temporal restrictions on suction dredging activities that are based on life history, distribution and abundance of Fish action species. This includes restrictions on suction dredging in the period immediately before spawning and during critical early life stages (i.e., spawning, incubation, and early emergence) of Fish action species (Table 4.3-1). Streams within the state that provide habitat for Fish species that are either very limited in number and/or distribution are proposed to be closed to suction dredging (Class A), or closed during critical spawning periods."*

However, in the case of KTR spring-run Chinook in the Salmon River watershed, the life history, abundance, and distribution of the fish are improperly accounted for in the spatial and temporal restrictions proposed by CDFG. The Class F suction dredging season (July 1 – Sept. 30) overlaps a minimum of two weeks with the well-documented start of spring-run Chinook spawning season beginning on the Salmon River no later than mid-

[39] Brucker, P. 2011. Personal communication with Peter Brucker, Program Director of the Salmon River Restoration Council, Sawyers Bar, CA. www.srrc.org

September[40] and does not, as the SEIR claims, restrict suction dredging "in the period immediately *before* spawning" (which would be late August or early September for the Salmon River KTR spring-run Chinook). As such, dredging will be permitted concurrently with the spawning of Salmon River KTR spring-run Chinook.

The Class F season, therefore, fails to adequately avoid potentially significant impacts identified in Impact-BIO-FISH-1 to KTR spring-run Chinook during spawning.

Additionally, the very limited number and limited distribution of KTR spring-run Chinook in general and of the Salmon River's distinct wild metapopulation in particular, suggest that this species would be adequately protected solely via a Class A closure so that direct, indirect, concurrent, and delayed impacts of dredging do not adversely impact the species.

The SEIR continues its rationale of how the "proposed program regulations will minimize the potential for disturbance to all spawning Fishes and their habitats" on 4.3-24 & 25:

- *"Section 228(c)(2): requires dredgers to provide CDFG with information regarding the location of their dredging operation(s). This will allow CDFG to monitor and manage areas with high dredging use, and potentially modify regulations if deleterious effects are identified.*
- *Section 228(k)(15): requires dredgers to level all tailing piles prior to working another excavation site or abandoning the excavation site. This will minimize the potential for Fish to spawn on unstable substrate.*
- *Section 228(k)(16): requires dredgers to avoid the disturbance of redds and adult fish."*

As for Section 228(c)(2): the proposed program does not establish any formal or organized effort to monitor the impacts of suction dredging nor to review regulations in light of further examination of the proposed programs actual impacts once implemented. In fact, the SEIR dismissed the alternative of tracking and adaptively managing stream use by suction dredgers. (SEIR 6-16, lines 26-33). With CDFG under tight budgetary restrictions and with no plan to request the Legislature to increase suction dredge permit fees to pay for monitoring or the additional expense of enforcing increasingly complex regulations, there is no reason to believe nor any evidence presented that indicates the dredge location reporting requirement will provide any reduction of impact to any biologic resource. Without a plan for monitoring in place nor the budgetary likelihood of being able to pay for such monitoring, this regulation is, in effect, meaningless.

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[40] Salmon River Restoration Council. 2011. Salmon River Spring Run Chinook Escapement Survey 2010-FISHERIES-FP-07. http://www.srrc.org/publications/programs/fisheries/SRRC%20Spring%20Chinook%20Spawner%20Surveys%202010%20Report.pdf, accessed 4/25/11.

As for Section 228(k)(15): the SEIR provides no scientific evidence in support of the claim that the requirement for dredgers to level all tailings piles will minimize the potential for fish to spawn on unstable substrate. In fact, Harvey & Lisle[41] indicate that "where managers determine that unstable dredge tailings may lead to unacceptable effects on spawning success, these effects could be reduced or eliminated through regulations that require that **tailings piles be redistributed to restore the original bed topography *and* particle size distribution**" (emphasis added). The proposed program's regulations do not require dredgers to meet this standard. Even if it were possible to restore original bed topography (and dredgers are submitting comments on this SEIR indicating that this requirement cannot be met), the regulations do not require restoration of original particle size distribution as the best available science indicates is necessary to reduce unacceptable effects on spawning success. As such, the best available science suggests that this regulation is insufficient to minimize adverse impacts and potential deleterious effects.

As for Section 228(k)(16): the proposed program allows dredging to occur concurrently with the start of KTR spring-run Chinook spawning season on the Salmon River. Although this regulation prohibits the disturbance of redds and adult fish, the proposed program should not be creating a situation in which dredging season overlaps with spawning season and early fry emergence and, having recognized yet allowed a potential deleterious effect of overlapping seasons, is in violation of Fish and Game Code § 5653. This regulation is no substitute for prohibiting all dredging during all parts of spawning season and fry emergence with enough of a temporal buffer to ensure no overlap even during atypical years or issuing a Class A closure on the Salmon River and its forks.

COMMENT # 21: SPATIAL AND TEMPORAL RESTRICTIONS DO NOT AVOID SEASONAL USE RESTRICTIONS AND OTHER REGULATIONS WOULD NOT PREVENT SIGNIFICANT DIRECT EFFECTS ON SPAWNING FISH SUCCESS AND THEIR HABITAT STATEWIDE. (SEIR 4.3-23,24,25).

The most relevant new information since the 1994 EIR and 1997 EIR are research findings reported by Harvey and Lisle[22] that found reduced egg-to-fry survival for Chinook salmon spawning in areas disturbed by suction dredging. Similar reduced survival would be expected for other fall spawning species such as federally listed Coho salmon. Disturbance of stream substrate by suction dredging indirectly kills developing eggs and alevins because the eggs and alevins tend to be scoured out during winter floods at a greater proportion than if the substrate had not been previously disturbed by dredging. This is not surprising. Anyone who understands or studies the perilous environment of a developing salmon egg would expect lethal impacts from streambed disturbance.[42] The SEIR (4.3-24 lines 15-22) acknowledges lethal fish impact by stating that:

[41] Harvey, B.C. and Lisle, T.E. 1999. Scour of Chinook Salmon Redds on Suction Dredge Tailings, North American Journal of Fisheries Management 19:613-617 http://www.fs.fed.us/psw/publications/harvey/Harvey99.PDF, accessed 4/25/11

[42] Nawa, R.K. and C.A. Frissell. 1993. Measuring Scour and Fill of Gravel Streambeds with Scour Chains and Sliding-Bead Monitors. North American Journal of Fisheries Management 13: 634-693.

15 Although dredge tailings may be attractive to spawning *Fish*,
16 they may be potentially less suitable for spawning than natural gravels. The loose substrate
17 often found in dredge tailings may be too unstable; embryos may experience reduced
18 survival under these conditions due to increased scouring (Thomas, 1985; Harvey and Lisle,
19 1999), which can be exacerbated as embryo development frequently coincides with periods
20 of high flow which mobilizes streambeds (Holtby and Healey, 1986; Lisle and Lewis, 1992).
21 Hence, loose tailings could have a substantial adverse effect on eggs and developing *Fish*
22 unless this material is allowed to disperse before spawning commences.

These statements are mostly accurate except for speculation about severity of dredging impacts and line 22 that implies that dispersal of dredged material somehow prevents or reduces the degraded conditions created by dredging. There is no scientific data to support this speculative assertion. Published findings by Harvey and Lisle[43] make it unnecessary to speculate about the reduced quality of dredged tailings for spawning salmon and expected lethal effects. This critical paragraph needs to be rewritten without speculation and caveats to be more consistent with published information. We suggest:

> *"Although dredge tailings are likely to be attractive to spawning Fish, they are less suitable for spawning than natural gravels. The loose substrate often found in dredge tailings are unstable; embryos experience reduced survival under these conditions due to increased scouring (Thomas, 1985; Harvey and Lisle, 1999), which are exacerbated as embryo development frequently coincides with periods of high flow which mobilizes streambeds (Holtby and Healey, 1986; Lisle and Lewis, 1992). Hence, tailings have a substantial adverse effect on eggs and developing Fish."*

Despite new information about the lethal effects of disturbed substrate, the SEIR continues to falsely purport that a temporal restriction immediately before fish spawning commences would result in "no significance" determination for fish species such as salmon. Contrary to what is stated in the SEIR (4-3-24, line 37), the three Proposed Program regulations (4.3-24 lines 39-42 and p. 25 lines 1-5) do not minimize the expected decreased egg-to-fry survival of salmon spawning on substrates previously disturbed by suction dredging.

Section 228 (c) (2) that requires dredgers to provide CDFG with information regarding the location of their dredging operations would not reduce lethal effects to salmon since

[43] Harvey, B.C. and Lisle, T.E. 1999. Scour of Chinook Salmon Redds on Suction Dredge Tailings, North American Journal of Fisheries Management 19:613-617
http://www.fs.fed.us/psw/publications/harvey/Harvey99.PDF, accessed 4/25/11.

CDFG lacks the funding to make pre-dredging site inspections (4.3-24 lines39-42;6-15 lines 11-23. Once the stream substrate has been disturbed by dredging the decreased survival of subsequent spawning salmon is certain. Monitoring of disturbance would not be effective since the irreversible damage to the substrate has already occurred. The SEIR provides no parameters for a "threshold" of disturbance at the site or reach that monitoring could detect and prevent with subsequent management. In addition CDFG lacks funding to conduct such monitoring.

"Section 228(k)(15): requires dredgers to level all tailing piles prior to working another excavation site or abandoning the excavation site." (4.3-25 lines 1-3) The assertion that "[t]his will minimize the potential for fish to spawn on unstable substrate" is speculative and not supported by scientific data. Spawning salmon will continue to be attracted to areas disturbed by mining. There is no feasible way to prevent this. It is also not technically feasible to restore the pre-disturbance sediment texture and stream bed grade once the sediments have been spewed out by a dredge and scattered downstream. Compliance with this requirement is not likely, mostly because it cannot be done easily, especially on larger rivers with relatively strong currents. R. Nawa has observed dozens of suction dredge sites and not one has had the holes filled or the streambed returned to pre-mining grade as required in regulations. Suction dredgers are not likely to change habits developed over decades of dredging. Even if tailings are leveled there is no scientific data that demonstrates that the deleterious effects found by Harvey and Lisle (1999) will be eliminated or even reduced.

"Section 228(k)(16): requires dredgers to avoid the disturbance of redds and adult fish." (4.3-25, lines 4-5). Fish would likely hide before dredgers see them and dredgers are not trained biologists. Dredgers cannot be expected to make an effort to locate redds that would preclude them from dredging. Only a trained biologist would likely recognize a redd, especially a steelhead redd or lamprey redd that is several weeks old.

Seasonal restriction that prevent dredging from occurring when salmon are attempting to spawn have been shown to be ineffective because pre-spawning disturbance causes reduced egg-to-fry survival that occurs when salmon spawn on the dredge tailings.[44]

The SEIR is deceptive about BIO-FISH -1 impact (SEIR4.3 p.23-25) because it couches scientifically proven lethal effects as "may" or "could" while assigning certainty "will" to protective regulations that have been demonstrated to be ineffective or remain unproven. The exact opposite is closer to what is known. The dredging effects are certain. The regulatory restrictions could or may reduce the impacts. The dredgers may not follow the regulations.

The SEIR fails to identify federally listed Coho salmon as a fish species that requires <u>all</u> of its occupied streams to be closed to dredging. The National Marine Fisheries Service

[44] Harvey, B.C. and Lisle, T.E. 1999. Scour of Chinook Salmon Redds on Suction Dredge Tailings, North American Journal of Fisheries Management 19:613-617
<u>http://www.fs.fed.us/psw/publications/harvey/Harvey99.PDF</u>, accessed 4/25/11

has listed suction dredging as a limiting factor for Coho.[45] All critical habitats for Coho would logically need to be Class A since suction dredging is discretionary and certainly does not contribute to the recovery of Coho salmon.

The CDFG has created a very high standard for dredging impact to be considered "deleterious" and did not consider impacts to individual members of a population to be significant, unless the species was extremely rare (SEIR 4.2-23 lines26-27). This arbitrary definition is unfortunate because it is grossly less protective than the Federal Endangered Species Act which prohibits the "take" of threatened or endangered species with more stringent protection of individuals and habitat: "Take may include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering." (SEIR4.3-3 lines 21-23)

For the Southern Oregon/northern California Coast (SONNC) Evolutionarily Significant Unit (ESU), the SEIR Proposed Program has identified "select" Coho salmon streams as Class A (no dredging) but many other Coho streams appear to be left open with seasonal restrictions that do not protect spawning habitat and would result in lethal effects (reduced egg-to-fry survival). For example, the Scott River, a tributary to the Klamath River, is habitat for federally threatened Coho salmon. The main stem Scott River and all tributaries accessible to Coho salmon have been identified as critical habitat (64FR24049-24061). The CDFG map of Coho salmon habitat indicates Coho present in the main stem as well as several west side tributaries (Shackleford Cr., Kidder Cr., Patterson Cr., Crystal Cr. , Etna Cr. , French Cr. , South Fork Scott River.[46] The Proposed Program has identified only some tributaries of the Scott River as Class A closed to dredging (Shackleford Cr., French Cr. and Sugar Cr. [SEIR 2-54,55]). The main stem Scott River and most other tributaries would be classified C and open to unlimited dredging with 4 inch dredges between July 1 and September 30. In addition the Scott River would be open to up to 8 inch commercial dredges at the discretion of CDFG (SEIR 2-17,18). Except for 3 minor tributaries, the spawning substrate of federally listed Coho salmon would be open to despoliation contrary to federal law. Coho salmon that spawn on dredge tailings would be expected to have lethal effects with reduced egg-to-fry survival. The SEIR appears to have provided minor stream protections to federally listed Coho salmon in the Scott River basin while promulgating regulations similar to those of the 1994 EIR despite the federal listing of Coho salmon. The CDFG cannot arbitrarily pick some Coho streams within the SONNC ESU to protect from the lethal effects of suction dredging while leaving others open to despoliation. Despite research that indicates that degradation of spawning habitat is the primary pathway of dredging effects to salmon, the SEIR clings to the notion that temperature is an overriding issue by apparently selecting Coho streams for Class A protection based on thermal refugia (SEIR Table 4.3-1 p. 3). All Coho salmon streams in California merit the Class A closure.

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[45] http://swr.nmfs.noaa.gov/recovery/Coho_SONCCC.htm#Conservation_Actions

[46] http://www.dfg.ca.gov/fish/documents/SAL_SH/SAL_Coho_Recovery/ReportToCommission_2004/HiResFigs/Figure_2-3.pdf

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Additional unexplained bias can be found with the proposed dredging restrictions for the Central California Coast Coho salmon ESU. The SEIR (Table 4.3-1 p.3) correctly proposes Class A closure for all Central Coast Coho streams and correctly acknowledges that "[n]o seasonal restrictions would avoid potential impacts to organisms or their habitat. Thus Class A restriction is proposed." Contrast this to SONNC Coho on the same page where the SEIR falsely states that "class C seasonal restriction on dredging would avoid or minimize potential impacts to spawning adults, egg incubation and emergence." All Coho salmon streams in California merit the Class A closure.

The SEIR failed to analyze, predict, or estimate quantitatively how many spawning salmon could be adversely affected in a typical high use river system based on the intensity of dredging (Appendix G-7). For example, the number of spawning salmon impacted by suction dredging in the Scott River could be estimated. Data about volume moved (Table 3-2), suction dredge survey results (Appendix G) and observations of spawning Chinook salmon suggest that each dredging day affects roughly the amount of gravel needed by one spawning female salmon. In 2008, the Scott River had an estimated 1,587 dredger days. This estimated amount of dredging would create the same number of potential salmon spawning sites disturbed. Salmon seem to seek out dredge disturbed sites for spawning and a four inch dredge passes gravel of suitable size for spawning. Both factors would cause salmon to use tailings at a higher rate than similar areas not disturbed. A conservative estimate would be that 10% of the disturbed sites would have spawning salmon. This means that an estimated 159 salmon would suffer reduced egg-to-fry survival. Regardless of the assumptions made, the number of spawning salmon and salmon eggs affected is never zero or even an insignificant number because of the relatively low numbers of salmon spawning, relatively high intensity of dredging, observed propensity of salmon to prefer dredged sediments for spawning (SEIR 4.3-24 line15), and dredge size limits that corresponds with the size of suitable spawning gravel.

The SEIR has not demonstrated that there is a surplus of salmon eggs that can be wasted to promote recreational suction dredging. Due to low abundance of salmon and degraded spawning habitat, every salmon egg deposited in the Scott River (and most other river systems) is too precious to waste for a recreational endeavor. During low Chinook escapement years (e.g., 2004), as few as 445 Chinook salmon spawned in the Scott River. The numbers of spawning Coho salmon in Klamath River sub-basins always much lower than Chinook numbers. Spawning habitat is generally poor in the Scott River and its tributaries because of high amounts of fine sediment from mining, agriculture, grazing, logging, and high road densities.

Sophisticated modeling has shown that a single dredger can have a significant impact on mercury concentrations in a moderate sized river system (SEIR 4.2-52:23-26). Similarly, even a minor amount of dredging in a small Coho stream could mean the difference between maintaining a viable population and eventual extirpation. New information from salmon spawning research (Harvey and Lisle, 1999) suggests that forty years of suction dredging is likely to have significantly contributed to declining or low salmon numbers in

some tributary systems. The SEIR fails to discuss or analyze the likely past effects of suction dredging on salmon populations.

Recommendation

Assign a Class A or Class B use classification to KTR spring-run Chinook (SEIR Table 2-1) to address temporal problems with the Class C use classification and impacts of a Class C season. Reassess and quantitatively analyze whether Section 228(c)(2) and Section 228(k)(15) regulations truly reduce the proposed program's adverse impact on anadromous fish statewide.

COMMENT #22: THE PROPOSED PROGRAM DOES NOT AVOID THE ADVERSE IMPACTS IDENTIFIED IN IMPACT-BIO-FISH-2 FOR SALMON RIVER KTR SPRING-RUN CHINOOK AS WELL AS OTHER SPAWNING FISH SPECIES ON RIVERS THROUGHOUT THE STATE.

Reasoning

The SEIR purports that potentially significant adverse impacts to fish (Impact BIO-FISH-2) are avoided by spatial and temporal restrictions on dredging (SEIR 4.3-28):

> *"If left unrestricted, direct entrainment, displacement or burial of eggs, larvae and mollusks by suction dredging would be potentially significant with respect to Significance Criteria A and D. However, the Proposed Program incorporates spatial and temporal restrictions to protect the most vulnerable early life stages of Fish action species (Table 4.3-1)."*

However, in the case of KTR spring-run Chinook in the Salmon River watershed, the life history, abundance, and distribution of the fish are improperly accounted for in the spatial and temporal restrictions proposed by CDFG. The Class C suction dredging season (June 1 – Sept. 30) overlaps a minimum of two weeks with the well-documented start of spring-run Chinook spawning season beginning on the Salmon River no later than mid-September[47] and does not, as the SEIR claims, restrict suction dredging "in the period immediately *before* spawning" (which would be late August or early September for the Salmon River KTR spring-run Chinook). As such, dredging will be permitted concurrently with the spawning of Salmon River KTR spring-run Chinook.

The Class F season, therefore, fails to adequately avoid the potentially significant direct impacts identified in Impact-BIO-FISH-2 to KTR spring-run Chinook during spawning.

Additionally, the very limited number and distribution of KTR spring-run Chinook in general and of the Salmon River's predominantly or exclusively wild subpopulation in particular, make this species protected from adverse impacts solely via a Class A closure

[47] Salmon River Restoration Council. 2010. Spring Chinook Summer Steelhead Survey Results 1980-2010 (Excel spreadsheet). http://www.srrc.org/publications/programs/fisheries/SRRC%20Spring%20Chinook%20Summer%20Steelhead%20Survey%20Results%201980-2010.xls, accessed 4/25/11.)

so that direct, indirect, concurrent, and delayed impacts of dredging do not adversely impact the species. As proposed, the program fails to close the Salmon River to dredging for the complete spawning season much less provide the more protective Class A closure.

The SEIR continues its rationale of how the proposed program regulations "would further minimize the potential for entrainment, displacement, or burial of eggs, larvae and mollusks in areas open to suction dredging:" on 4.3-28:

- *"Section 228(c)(2): requires dredgers to provide CDFG with information regarding the location of their dredging operation(s). This will allow CDFG to monitor and manage areas with high dredging use, and potentially modify regulations if deleterious effects are identified.*
- *Section 228(k)(13): prohibits dredging in mussel beds.*
- *Section 228(k)(14): requires dredgers to take reasonable care to avoid dredging silt and clay materials that may result in increased turbidity and deposition of fines on the gravels.*
- *Section 228(k)(15): requires dredgers to level all tailing piles prior to working another excavation site or abandoning the excavation site.*
- *Section 228(k)(16): requires dredgers to avoid the disturbance of eggs, redds, tadpoles and mollusks."*

As for Section 228(c)(2): the proposed program does not establish any formal or organized effort to monitor the impacts of suction dredging nor to review regulations in light of further examination of the proposed programs actual impacts once implemented. In fact, the SEIR dismissed the alternative of tracking and adaptively managing stream use by suction dredgers. (SEIR 6-16, lines 26-33). With CDFG under tight budgetary restrictions and with no plan to request the Legislature to increase suction dredge permit fees to pay for monitoring or the additional expense of enforcing increasingly complex regulations, there is no reason to believe nor any evidence presented that indicates the dredge location reporting requirement will provide any reduction of impact to any biologic resource. Without a plan for monitoring in place nor the budgetary likelihood of being able to pay for such monitoring, this regulation is, in effect, meaningless.

As for Section 228(k)(14): this requirement is based on a subjective determination of what "reasonable care" means as well as a subjective determination of what defines a "significant increase in increased turbidity." No scientific study has ever indicated that dredging does not increase turbidity or deposition of fines on gravel. It is important to note that despite the SEIR's claim to the contrary on p. 4.3-28, Section 22k(k)(14) does not actually address the issue of deposition of fines on gravels (see Proposed Amendments To Regulations, Title 14, p.15).

As for Section 228(k)(15): the SEIR provides no scientific evidence in support of the claim that the requirement for dredgers to level all tailings piles will minimize the potential for fish to spawn on unstable substrate. In fact, Harvey & Lisle (1999) indicate that "Where managers determine that unstable dredge tailings may lead to unacceptable effects on spawning success, these effects could be reduced or eliminated through

regulations that require that **tailings piles be redistributed to restore the original bed topography *and* particle size distribution**" (emphasis added). The proposed program's regulations do not require dredgers to meet this standard. Even if it were possible to restore original bed topography (and dredgers are submitting comments on this SEIR indicating that this requirement cannot be met), the regulations do not require restoration of original particle size distribution as the best available science indicates is necessary to reduce unacceptable effects on spawning success. As such, the best available science suggests that this regulation is insufficient to minimize adverse impacts and potential deleterious effects.

As for Section 228(k)(16): the proposed program allows dredging to occur concurrently with the start of KTR spring-run Chinook spawning season on the Salmon River. Although this regulation prohibits the disturbance of redds and adult fish, the proposed program should not be creating a situation in which dredging season overlaps with spawning season and early fry emergence and, having recognized yet allowed a potential deleterious effect of overlapping seasons, is in violation of Fish and Game Code § 5653. This regulation is no substitute for prohibiting all dredging during all parts of spawning season and fry emergence with enough of a temporal buffer to ensure no overlap even during atypical years or issuing a Class A closure on the Salmon River and its forks.

Recommendation

Assign a Class A or Class B use classification to KTR spring-run Chinook (SEIR Table 2-1) to address temporal problems with the Class C use classification and impacts of a Class C season. Reassess and quantitatively analyze whether Section 228(c)(2), Section 228(c)(14) and Section 228(k)(15) regulations truly reduce the proposed program's adverse impact on KTR spring-run Chinook.

COMMENT #23: THE PROPOSED PROGRAM DOES NOT AVOID THE ADVERSE IMPACTS IDENTIFIED IN IMPACT-BIO-FISH-3 FOR SALMON RIVER KTR SPRING-RUN CHINOOK AS WELL AS OTHER SPECIES ON RIVERS THROUGHOUT CALIFORNIA.

Reasoning

The SEIR purports that potentially significant adverse impacts to fish (Impact BIO-FISH-3) are avoided by spatial and temporal restrictions on dredging (SEIR 4.3-30):

> *"If left unrestricted, impacts of suction dredging early life stages of Fish would be potentially significant under Significance Criteria A and D. However, the Proposed Program incorporates spatial and temporal restrictions on suction dredging where necessary to protect the development of critical early life stages of Fish action species (Table 4.3□1). Spatial and temporal closures of streams for Fish action species provides surrogate protection for many other species of aquatic fauna with life histories similar to the action species."*

Again, in the case of KTR spring-run Chinook in the Salmon River watershed, the life history, abundance, and distribution of the fish are improperly accounted for in the spatial and temporal restrictions proposed by CDFG. The Class C suction dredging season (June 1 – Sept. 30) overlaps a minimum of two weeks with the well-documented start of spring-run Chinook spawning season beginning on the Salmon River no later than mid-September (Salmon River Restoration Council 2011) and does not, as the SEIR claims, restrict suction dredging "in the period immediately *before* spawning" (which would be late August or early September for the Salmon River KTR spring-run Chinook). As such, dredging will be permitted concurrently with the spawning of Salmon River KTR spring-run Chinook.

West et al. found spring-run Chinook survival to fry emergence in the South Fork Salmon River was highest in areas with the lowest volume of sediment, and lowest in areas with the most sediment.[48] The SEIR (p. 4.3-29) recognizes that "dredging has potential to release fine materials which can clog interstitial spaces" and "can result in a number of negative effects, including the reduced size of embryos at various developmental stages, premature emergence of alevins (newly hatched salmon still attached to the yolk sac), increased alevin development time, and higher pre□and post-hatching mortality." According to the Salmon River TMDL, "local residents have observed turbidity plumes and deposition of fine material downstream of suction dredges" (North Coast Regional Water Quality Control Board 2005).

The SEIR continues its rationale of how the proposed program regulations "would further minimize the potential impacts to critical early life stages:" on 4.3-30 & 31:

- *"Section 228(k)(3): prohibits dredgers from dredging within 3 feet of the lateral edge of the current water level. This regulation would protect against streambank destabilization that could result in release of fine sediment.*
- *Section 228(k)(4): prohibits dredgers from damaging or removing streamside vegetation. This regulation would protect against streambank destabilization that could result in release of fine sediment.*
- *Section 228(k)(14): requires dredgers to take reasonable care to avoid dredging silt and clay materials that may result in increased turbidity and deposition of fines on the gravels.*
- *Section 228(k)(15): requires dredgers to level all tailing piles prior to working another excavation site or abandoning the excavation site.*
- *Section 228(k)(16): requires dredgers to avoid the disturbance of eggs, redds, tadpoles and mollusks."*

[48] West, John R. 1991. A Proposed Strategy to Recover Endemic Spring-Run Chinook Salmon Populations and Their Habitats in the Klamath River Basin, USDA Forest Service, Klamath National Forest, 1312 Fairlane Road, Yreka, CA 96097 http://www.krisweb.com/biblio/klamath_usfs_west_1991.pdf, accessed 4/25/11.)

While Section 228(k)(3) and (4) regulations are likely to assist in minimizing sedimentation originating outside the active stream channel, the requirement to level all tailings piles in Section 22(k)(15) is unlikely to minimize impacts associated with sedimentation or redistribution of fines on gravels because it is inconceivable for dredgers to be able to place fines and sediment back into a dredge hole. In many situations, dredging re-suspends and transports most or all of the fine sediment that may clog interstices of gravel and impact early life stages of fish well away from the dredge and tailings pile. The SEIR provides no indication of how this easily transported fine sediment may be captured returned to the originating dredge hole.

As for Section 228(k)(14): this requirement is based on a subjective determination of what "reasonable care" means as well as a subjective determination of what defines a "significant increase in increased turbidity." This is too vague and subjective and can be expected to result in less than adequate compliance. No scientific study has ever indicated that dredging does not increase turbidity or deposition of fines on gravel. It is important to note that despite the SEIR's claim to the contrary on p. 4.3-28, Section 22k(k)(14) does not actually address the issue of deposition of fines on gravels but rather simply the subjective and qualitative interpretation of increased turbidity (see Proposed Amendments To Regulations, Title 14, p.15).

Recommendation

Assign a Class A or Class B use classification to KTR spring-run Chinook (SEIR Table 2-1) to address temporal problems with the Class C use classification and impacts of a Class C season. Reassess and quantitatively analyze whether Section 228(c)(14) and Section 228(k)(15) regulations truly reduce the proposed program's adverse impact on KTR spring-run Chinook.

COMMENT #24: THE PROPOSED PROGRAM DOES NOT AVOID THE ADVERSE IMPACTS IDENTIFIED IN IMPACT-BIO-FISH-8 FOR SALMON RIVER KTR SPRING-RUN CHINOOK BECAUSE MANY IMPORTANT AND WELL-DOCUMENTED THERMAL REFUGIA HAVE BEEN OMITTED FROM THE LIST OF AREAS CLOSED TO DREDGING.

Reasoning

The SEIR purports that potentially significant adverse impacts to fish (Impact BIO-FISH-8) are avoided by "specific year round closures of areas within streams that are known to provide thermal refugia for this species" (SEIR 4.3-41):

> *"If left unrestricted, impacts of suction dredging on thermal refugia would be potentially significant with respect to Significance Criteria A, B and D. More specifically, unrestricted dredging of thermal refugia utilized by Chinook salmon in the Klamath and Salmon River watersheds could result in a substantial decline of the species, alteration of thermal refugia habitat, and affect movement of the species within summer holding areas. However, the Proposed Program regulations include specific year-round*

> *closures of areas within streams that are known to provide thermal refugia for this species (Appendix L). Closures of these areas, and appropriate buffers in the upstream direction, will provide protection for this type of habitat."*

Salmon River thermal refugia with holding habitat that have been documented both on the ground and/or by airborne remote sensing surveys but are omitted from the SEIR's Appendix L ("Species Based Restrictions On Proposed Program Activities") include:

1. Wooley Creek confluence with main stem Salmon River *†
2. Tom Payne Creek confluence with main stem Salmon River †
3. Grants Creek confluence with main stem Salmon River †
4. Morehouse Creek confluence with main stem Salmon River *†
5. Lewis Creek confluence with main stem Salmon River *†
6. Springs at Bloomer Falls on main stem Salmon River *
7. Crapo Creek confluence with main stem Salmon River *†
8. Knownothing Creek confluence with SF Salmon River *†
9. Hotelling Creek confluence with SF Salmon River *
10. Black Bear Creek *†‡
11. Indian Creek confluence with SF Salmon River *
12. East Fork of the SF Salmon River confluence with SF Salmon River *†
13. Picayune Gulch confluence with NF Salmon River †
14. Peck Gulch confluence with NF Salmon River †
15. Cronan Gulch confluence with NF Salmon River *†‡
16. Olsen Gulch confluence with NF Salmon River *
17. Glasgow Creek confluence with NF Salmon River *†
18. Whites Gulch confluence with NF Salmon River *†‡ (SRRC 2005 thermal refugia survey documented dredge tailings filling in much of the pool)
19. North Russian Creek confluence with NF Salmon River *†‡
20. South Russian Creek confluence with North Russian Creek (NF Salmon drainage) *†‡

* = identified by Salmon River Restoration Council's Thermal Refugia Surveys, 2004 & 2005
† = identified by Salmon River Basin Thermal Infrared (TIR) Survey, 2009
‡ = Coho present in refugia during Salmon River Restoration Council's Thermal Refugia Survey, 2005
All data from Salmon River Restoration Council, PO Box 1089, Sawyers Bar, CA, (530) 462-4665

Not all thermal refugia occur at mouths of cooler tributary streams. Interactions with groundwater and hyporheic flows also provide cool water for thermal refugia or to otherwise buffer stream temperatures along discernable sections of stream reach, providing local habitat and refugia from warmer main-stem temperatures.[49] An airborne thermal infrared remote sensing survey of the Salmon River and its forks conducted by Watershed Sciences, Inc. on July 22 & 23, 2009 identified several areas in the Salmon

[49] Burkholder, B.K., Grant, G.E., Haggerty, R., Khangaonkar, T., and Wampler, P.J. 2008. Influence of hyporheic flow and geomorphology on temperature of a large, gravel-bed river, Clackamas River, Oregon, USA. Hydrological Processes 22, 941–953 (2008)

River watershed where subsurface and hyporheic flows create areas of cooler water, sometimes providing substantial cool water inputs for long reaches.[50] Areas with an important contribution of cool water from subsurface flows, hyporheic flows, seeps and springs identified by the 2009 Salmon River Basin Thermal Infrared Survey include:

1. the 2.5 mile long reach on the main stem Salmon River immediately below the confluence of the NF and SF Salmon Rivers at Forks of Salmon, CA,
2. at river mile 9.25 on the NF Salmon River,
3. the vicinity around and below Little North Fork confluence with the NF Salmon River,
4. at river mile 14.79 on the NF Salmon near Sawyers Bar, CA,
5. at river mile 14.93 on the NF Salmon near Sawyers Bar, CA,
6. near the confluence of Little Grizzly Creek and the South Fork Salmon River.

Despite the clear understanding of the significance of thermal refugia for the survival of salmonids and other species, the locations of thermal refugia created by springs, seeps, subsurface, and hyporheic flows are poorly known. Nevertheless, all identified areas of cool water holding habitat should be closed to all dredging.

Recommendation

Add all omitted thermal refugia listed above to Appendix L and place a Class A closure on these areas with an effective 500 foot closure. Obtain and closely review the Salmon River Restoration Council's detailed July 2009 TIR data to identify all areas where hyporheic thermal refugia are likely to exist and close these areas to dredging.

COMMENT #25: THE COMPLEX SET OF THERMAL REFUGIA CLOSURES AND REGULATIONS REQUIRED TO ATTEMPT AVOIDANCE OF ADVERSE IMPACT TO FISH ON THE SALMON RIVER CREATES A FAILURE-PRONE SYSTEM DEPENDENT UPON MICROMANAGEMENT OF TOO MANY VARIABLES TO BE EFFECTIVE.

Reasoning

In order to avoid adverse impacts to fish, the proposed program relies very heavily on a complex set of regulations to micromanage when, where, and how a dredge may be used. Nowhere is this more apparent—or prone to failure—than on the Salmon River with its 38 known thermal refugia that, if closed to dredging, will create a complex and confusing patchwork of opened and closed areas throughout the river system. If any component in this system of micromanagement is not working flawlessly—whether that is the result of an individual dredger knowingly or unknowingly violating the regulations or a systemic

[50] Watershed Sciences, Inc. 2010. Salmon River Basin Thermal Infrared (TIR) Survey Report, prepared for Salmon River Restoration Council. http://www.srrc.org/publications/programs/monitoring/SRRC%20Salmon_River_TIR_Report%202009.pdf , accessed 4/25/11.

issue with the regulations to begin with (e.g., how will a thermal refugia and its 500 foot radius be identified on the ground)—there are likely to be adverse and potentially deleterious effects to sensitive, rare, and threatened species. Given the significance of potential impact and the likelihood of some degree of failure to successfully micromanage the many potentially adverse impacts, an added degree of caution is required.

For example, how will CDFG manage the multitude of thermal refugia closures on the Salmon River? There are a minimum of 38 known thermal refugia at tributary confluences alone, and managing these 38 closed areas as is required to avoid significant impacts to fish would require an extraordinary effort on part of CDFG *and* the willing and knowledgeable cooperation of all dredgers. Almost none of the tributaries that form thermal refugia at their mouths are identified on the ground by signs at all (and none of them are signed at the refugia). Every dredger would need a detailed map and geographic awareness to be able to determine whether or not they are dredging in a closed thermal refugia. It is unrealistic to assume that placing a thermal refugia on a Class A closure list will equate to compliance on the ground when there are so many different refugia in a small area. This is not a situation where one or two places are closed; it is a large number of unmarked closed areas within a heavily dredged river corridor. The SEIR does not discuss how this will be successfully managed nor provide any analysis of consequences of failure.

Any failure of the proposed program's complex set of regulations, seasonal restrictions, and geographic closures to avoid impacts of dredging on KTR spring-run Chinook could have a significant impact and deleterious effect on these fish. Due to the exceptionally low population of KTR spring-run Chinook on the Salmon River—as few as 78 adult fish have been counted some years and the median population is only 466[51]—an impact on any individual fish could have an impact at the population level.

Recommendation

Rather than relying on a complex program of micromanagement prone to failure, the proposed program should close the Salmon River, its forks and tributaries to all dredging year-round (Class A).

COMMENT #26: THE PROPOSED PROGRAM'S REGULATIONS EXTEND THE OPEN DREDGING SEASON ON THE SALMON RIVER AND ITS FORKS AS COMPARED TO THE 1994 REGULATIONS, OVERLAPPING DREDGING WITH THE BEGINNING OF SPRING-RUN CHINOOK SPAWNING SEASON IN FALL AND THE LATTER PORTION OF FRY EMERGENCE IN SPRING. THIS CREATES A SITUATION WHERE MINING ACTIVITY WILL

[51] Salmon River Restoration Council. 2010. Spring Chinook Summer Steelhead Survey Results 1980-2010 (Excel spreadsheet). http://www.srrc.org/publications/programs/fisheries/SRRC%20Spring%20Chinook%20Summer%20Steelhead%20Survey%20Results%201980-2010.xls, accessed 4/25/11.

DIRECTLY THREATEN AND ADVERSELY IMPACT SPAWNING ADULT FISH, REDDS, EMERGING FRY, AND HABITAT ACTIVELY BEING USED FOR REPRODUCTION.

Reasoning

Although this discrepancy is mentioned in several of the previous comments, it is of such significance that it merits its own comment. If anything, the increase in knowledge and understanding of the impacts of suction dredging on salmonids coupled with the continued decline of KTR spring-run Chinook population on the Salmon River since 1994, these fish should be receiving an increase in temporal protection by the proposed program's new regulations, not a decrease in temporal protection as is proposed.

Spawning surveys on the Salmon River have located redds as early as September 14 indicating that KTR spring-run Chinook spawning is, at least in some years, taking place prior to mid-September.[52]

West (1992) recommended "CDFG should consider changing suction dredge operating season for Klamath River tributaries in Siskiyou County (Zone D) to June 15 or July 1 to September 15, to reduce potential impacts to larval steelhead development.[53]" Combining this earlier recommendation aimed at protecting steelhead with the known dates of spring-run Chinook spawning and fry emergence, *at the very minimum* the Salmon River should not be open to any dredging between September 1 and July 1 (Class B). As stated earlier, the challenge of successfully implementing a program reliant on micromanaging the time, space, and specific methods of suction dredging combined with the likelihood for significant adverse impact and deleterious effect on an already rare population of the last remaining wild KTR spring-run Chinook, the only logical and reasonable method of protecting these fish from harm is to completely close the Salmon River to dredging (Class A).

Further, Dr. Peter Moyle's expert opinion on the potential effects of suction dredging on fishes of the Klamath River and tributaries, provided on behalf of the plaintiffs in Karuk Tribe vs. California Department of Fish and Game states[54]:

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[52] Salmon River Restoration Council. 2011. Salmon River Spring Run Chinook Escapement Survey 2010-FISHERIES-FP-07. http://www.srrc.org/publications/programs/fisheries/SRRC%20Spring%20Chinook%20Spawner%20Surveys%202010%20Report.pdf, accessed 4/25/11.

[53] West, J.R., O.J. Dix, A.D. Olson, M.V. Anderson, S.A. Fox, and J.H. Power. 1992. Evaluation of Fish Habitat Conditions and Utilization in Salmon, Scott, Shasta, and Mid-Klamath Sub- Basin Tributaries 1989-1991. U.S. Department of Agriculture Forest Service. Klamath National Forest. Yreka, CA. http://www.fws.gov/yreka/Final-Reports/rmaap/1990-FP-2.21-KNF.pdf, accessed 4/25/11.

[54] Superior Court of California, Alameda County, RG0521197) (Moyle, P.B. 2004. Expert Report of Professor Peter B. Moyle, Ph.D. Provided as testimony in Karuk Tribe vs. California Department of Fish and Game (Superior Court of California, Alameda County, RG0521197).

> "In my professional opinion, the following waters should be Class A (no dredging permitted) waters beyond what is already classified as such: …Salmon River including the north and south forks and all tributaries. This designation is to protect the entire suite of Klamath Basin anadromous fishes, especially Coho salmon in the tributaries, spring-run Chinook and summer steelhead in the two forks of the Salmon River, and green sturgeon and lamprey in the main stem salmon."

Recommendation

Designate the Salmon River as Class A to adequately protect KTR spring-run Chinook and other species, such as steelhead, from temporal conflicts with active dredging and residual adverse habitat impacts that remain following any dredge season.

COMMENT # 27: THE DSEIR FAILS TO IDENTIFY WHAT ENTITY IS CHARGED WITH PROTECTING CULTURAL RESOURCES FROM 'UNMITIGABLE IMPACTS' ASSOCIATED WITH DREDGE MINING

Reasoning

Commenters appreciate the thorough description, as developed in *Sections 4.5.1 – 4.5.3*, of the regulatory and environmental settings that accurately contextualize the proposed Suction Dredge Permitting Program. It is clear from both archaeological and ethnographic evidence, as well as from indigenous oral histories, that California prehistory offers irreplaceable resources that are part of our shared heritage.

The *Criteria for Determining Significance* defines three significant impacts: Resources eligible for national, state, or local registers of historic places; unique archaeological resources; and human remains. The document further states that suction dredge mining has the potential to affect significant historical resources, traditional cultural properties, and archaeological resources. Your document recognizes that significant archaeological resources and traditional cultural properties "are located along waterways throughout California," and may be impacted by this project, and that these resources may also retain the integrity needed for National Register Nomination as addressed in *Chapter 4.5.2 – Regulatory Setting.*

In *Section 4.5.9:27-30*, the DEIR states that "all mining activities have left their mark on the landscape, including river diversions, waste rock and tailing piles, dredge tailings, cut banks, prospect pits, shafts, adits, and water conveyance systems such as dams, reservoirs, ditches, and flumes." However, the draft language (*4.5.10:17-20*) goes further in acknowledging that "regardless of these natural and human-made disturbances, the state's waterways remain abundant with both recorded and unrecorded cultural resources, all of which provide a detailed record of California's rich cultural heritage." Thus you have clearly established the potential to adversely impact significant cultural resources in the Suction Dredge Permitting Program.

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http://karuk.us/press/mining_pdfs/Peter-Moyle-Expert-Report-on-Suction-Dredging-on-Klamath.pdf, accessed 5/3/11.

However, Commenters strongly disagree with the Department's findings that such impacts are "unavoidable," and that CDFG has no jurisdictional authority for enforcement or mitigation. Those statements have no supporting documentation. If DFG lacks such authority, it is obligated under CEQA to disclose who does. The DSEIR also suggests that DFG does not have the resources for Native American consultation (*4.5.14:1-4*). This statement is very problematic. Sovereign tribal governments, such as the Karuk Tribe, must have the ability to negotiate in good faith through formal government-to-government consultation. This consultation needs to be on-going.

Recommendation

The Department should engage in Government-to-Government consultations with Tribes with cultural resources at stake. Prohibit suction dredge mining on all rivers and streams for which the Department cannot affirmatively establish that suction dredging will not cause deleterious impacts to fish. Meanwhile, Department should identify a dependable mechanism by which these resources can be protected. After the Department has gathered sufficient data, if it later determines that certain rivers or streams can be dredged without deleterious impacts to fish, to may amend its regulations pursuant to CEQA and APA to reclassify the respective water body.

COMMENT # 28: THE DEPARTMENT'S RECOMMENDED MEASURES FOR PROTECTION OF CULTURAL RESOURCES ARE INADEQUATE, INEFFECTIVE, AND IN SOME CASES WOULD LEAD TO EVEN GREATER DESTRUCTION OF CULTURAL RESOURCES

Reasoning

The Department suggests providing an advisory informational packet to each suction dredge permit holder to provide "Best Management Practices" guidance that will "include guidelines to minimize and avoid adverse affects…such guidance would only be advisory and would therefore not reduce adverse effects to a less-than-significant level" (*4.5.13*). Such an approach is likely to encourage rather than mitigate unauthorized looting, and would typically function to identify resources that have been discovered following site disturbance. The information would effectively help permit holders to identify resources in the tradition of "amateur archaeologists," an avocation whose adverse impacts on these resources are well documented by both Native people and the scientific community.

In addition, the Department proposes archival research and "field surveys by qualified archaeologists and/or architectural historians, to determine the location of recorded resources prior to dredging activities, and data recovery and other documentation efforts designed to collect or record the significant data associated with resources" (*4.5.13:15-19*). This language does not address the unrecorded resources that may be encountered, and suggests "data recovery" as appropriate mitigation for dredging impacts. This also implies that priority would be given to suction dredging, even if potentially significant cultural resources are discovered, and without any professional evaluation of eligibility for nomination to the National Register. The potential for impacts to Traditional Cultural Properties (which may or may not contain tangible cultural resources) is also not addressed.

Recommendations

In the context of cultural resource management, Commenters are uncomfortable with these proposed actions, and the reinstatement of largely unmanaged ground disturbing activity along the Klamath River and its tributaries. Commenters support the following recommendations provided by the Karuk Tribal Historic Preservation Office:

- At a minimum, prior professional archaeological and tribal review and evaluation of all sites to be permitted for suction dredging. This assessment recognizes that many sites are unrecorded throughout California, and maintain both their significance and integrity.

- Funding for such site review to be provided by through Dredge Permit fees.

- Clear provision for enforcement and defined jurisdictional authority.

- All permit holders must be advised of Federal and State laws that govern cultural resources, and the associated penalties for any infractions of those laws.

- All cultural resource information must remain confidential, and not made public. Any associated records, site maps, and associated materials are to be kept in a secure facility – either the appropriate Information Center and/or THPO office.

- Annual review of the program with key stakeholders, including tribal government representatives. Development of a clear and comprehensive mechanism to provide findings and assess impacts, including cultural resource protection and management.

COMMENT # 29: THE SEIR FAILS TO PROVIDE ANY RECENTLY COLLECTED SUCTION DREDGE TURBIDITY DATA FROM 303(D) SEDIMENT LISTED STREAMS ON THE NORTH COAST TO SUBSTANTIATE THE "LESS THAN SIGNIFICANT" DETERMINATION FOR EFFECT OF TURBIDITY/TSS DISCHARGES FROM SUCTION DREDGING (IMPACT WQ-3 SEIR 4.2-28).

Reasoning

The SEIR (4.2-31 lines 39-44) states that "[w]hen the levels of suspended solids (and thus turbidity) become extremely high, they can adversely impact fish and macro invertebrates by making it difficult for sight feeders to locate prey, causing abrasive injuries, clogging gills and respiratory passages, and/or by blanketing the streambed, thereby killing incubating fish eggs/larvae and benthic macro invertebrates (McKee and Wolf, 1963; EIFAC, 1965; NAS, 1972; Alabaster and Lloyd, 1980)." The Proposed Program has a new provision that states "reasonable care shall be used to avoid dredging silt and clay material, the disturbance of which would significantly increase in turbidity." Dredging into silt/clay stream banks, which is known to occur regularly, is likely to create extremely high TSS and turbidity, but the SEIR conveniently assumes that this will

not happen because "the Program would provide enforceable conditions." (SEIR4.2-32).

In reality, neither dredgers nor law enforcement officials can reasonably be expected to recognize silt or clay material (less than 63 micrometers) or what "reasonable care" means. A significant effect is certain when stream banks are excavated in conjunction with dredging on small remote Coho streams (e.g., Smith River and Scott River tributaries). Extreme turbidity, exceeding that commonly reported in controlled studies (SEIR 4.2-29 lines 12-15) is likely to occur and have significant impacts of fish.

The SEIR fails to acknowledge that the reason many streams are listed for sediment is because the streambed has a relatively high content of silt/clay. "Reasonable care" could mean no dredging in silt/clay laden 303(d) listed streams. In small, low-gradient streams favored by Coho salmon, dredgers are likely to create extremely high turbidity which could extend very far down the stream. Coho could not avoid the plume in small streams because it would extend from bank to bank. For example, Nawa[55]reports having to discontinue snorkel counting of juvenile Coho salmon when turbid water from a single suction dredge muddied an estimated 1,000 feet of a small unnamed tributary to Middle Fork Sixes River in Oregon. The entire water column was muddied and the juvenile Coho salmon had no place to escape the turbidity. Assumptions made by the dSEIR about fish avoidance of turbidity would only be valid on larger streams such as the Klamath River.

The dSEIR provides no data about turbidity/TSS measurements in 303(d) sediment listed streams to demonstrate the validity of dSEIR speculation of how dredging would actually affect turbidity/TSS. In the absence of data collected from suction dredgers in 303(d) streams, the only valid assumption is that they would adversely affect fish, especially federally listed Coho salmon.

The SEIR (5-28) fails to explain or provide a scientifically valid reason why the CDFG "believes" that SEIR reported significant cumulative turbidity and significant cumulative discharges (that would appear to warrant dredging closures) are not "believed" to be necessary to avoid deleterious effects to fish. Opinions not supported by facts are not valid.

Recommendation

Ban suction dredge mining in all 303(d) impaired streams until such time that studies can be designed and conducted, data collected and impacts assessed such that the Department has sufficient data to determine that no suction dredging operation will cause deleterious impacts to fish. Once the latter has occurred, the Department should amend the regulations, if the data supports reclassification of the respective streams to allow suction dredge mining to occur.

[55] Nawa, R.K. 2010. Mining Impacts in the Siskiyou Wild Rivers Area Southwest Oregon. Siskiyou Project. Grants Pass, Oregon.

COMMENT # 30: The DSEIR FAILS TO REPORT OR ESTIMATE THE ACTUAL ANNUAL LOSS OR REDUCTION OF ECONOMICALLY AND CULTURALLY IMPORTANT SPECIES DUE TO SUCTION DREDGING.

Reasoning

The SEIR asserts that economically important and culturally significant species such as salmonids, lamprey, mussels, and sturgeon will not experience deleterious effects as defined in the SEIR (2-4, 5). Impacts to these species are routinely listed as "less than significant" meaning that there is a measurable impact, but the impact is not likely to result in an adverse population-level effect on a particular species (SEIR 4.3-23 lines 16-20; 4.3 pp. 23-26; Tables 4.3-1, 2, 3). Since the impact is measurable, one would expect the Department to have measured it and determined in an analytic manner that it is "less than significant". The Department has reported no such measurements. The Department has not provided any scientific data about the numeric severity of impacts to species of concern. The Department cannot report how many fish, fish eggs, and mussels the dredgers kill every year, but whatever the number is, the Department can assure the public that it is "less than significant". The lack of any credible data whatsoever demonstrates that the assertions of "less than significant" for *fish* species are purely speculative and not based on any credible quantitative science. Since the Department has no funds to measure scientifically the fish, fish eggs, and mussels the dredgers are killing directly or indirectly, the dredging must be prohibited in stream areas where economically important and culturally significant species live and breed. The only recent study (Harvey and Lisle 1999) that took a hard look at the effectiveness of protecting spawning salmon from suction dredging with seasonal restrictions found significant lethal effects despite the restrictions.

Recommendation

Prohibit suction dredge mining on all rivers and streams for which the Department cannot affirmatively establish that suction dredging will not cause deleterious impacts to fish. Meanwhile, quantitatively evaluate impacts to culturally important species before considering whether or not dredge mining has a deleterious effect on these species. After the Department has gathered sufficient data, if it later determines that certain rivers or streams can be dredged without deleterious impacts to fish, to may amend its regulations pursuant to CEQA and APA to reclassify the respective water body. .

COMMENT # 31: THE DSEIR FAILED TO DEVELOP A FRAMEWORK FOR ASSESSING CUMULATIVE SEDIMENT EFFECTS ON SPAWNING SUCCESS OF SALMONIDS AND OTHER AQUATIC ANIMALS. ASSUMING THAT STREAMBEDS, REGARDLESS OF CONDITION, ARE SUITABLE FOR DREDGING WILL LIKELY RESULT IN SIGNIFICANT IMPACTS TO AQUATIC ANIMALS CURRENTLY USING DEGRADED STREAM CHANNELS.

Reasoning

The SEIR (Figure 4.3-2) provides a diagram of possible effects but fails to integrate temporal impacts with life history information from affected species. For example, nesting birds such as harlequin ducks that complete reproduction prior to dredging seasons would not be impacted except by Class H streams. Mussels and juvenile lamprey which are in the substrate all year (benthic) would be vulnerable to dredging impacts regardless of dredging season. Dredge tailings are used by spawning salmon whose eggs and alevins can be scoured out at higher rates by subsequent winter floods[22]. Even in undredged areas, scour and fill is a major factor affecting egg-to-fry survival.[56] The stability of spawning substrate has been greatly compromised by logging, roads, and mining which have at least doubled the natural rates of erosion and increased fish killing fine sediment.[57] A cumulative effects analysis for streams would allow some analysis of increased risk to spawning salmon when dredgers work substrates already heavily impacted. For example, the Scott River main stem has extremely high fine sediment content. Standards could be developed that would exclude dredging in substrates already at marginal quality for spawning salmon. Data are available from stream surveys and watershed analyses but were not used in the analysis. A starting point would be 303(d) listed streams for sediment, but the SEIR has inappropriately limited sediment considerations to turbidity with Water Quality alternative (SEIR 6-10 lines 33-39). The more relevant issue for salmon is streambed texture and stability because of findings by Harvey and Lisle (1999). The SEIR has failed to investigate the quality of spawning substrate as it would be affected by dredging. This area of inquiry would be much more relevant to salmon than turbidity.

Another recurring stream deficiency in the Klamath Mountains and coastal streams is high amounts of bedrock in some stream systems impacted by logging, landslides, wood removal, and dredging. Every patch of gravel in bedrock dominated channels is acutely valuable to benthic animals and salmonids. Dredgers would be forced to disturb what little gravel is available or worse they would excavate stream banks for material to sort. Bedrock dominated streams could also be identified and excluded with data available from stream surveys.

Recommendation

Prohibit suction dredge mining on all rivers and streams for which the Department cannot affirmatively establish that suction dredging will not cause deleterious impacts to fish. Meanwhile, investigate and discuss the cumulative impacts of sediment introduction to streams on salmonids and other aquatic animals. After the Department has gathered sufficient data, if it later determines that certain rivers or streams can be dredged without

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[56] Nawa, R.K. and C.A. Frissell. 1993. Measuring Scour and Fill of Gravel Streambeds with Scour Chains and Sliding-Bead Monitors. North American Journal of Fisheries Management 13: 634-693.

[57] Columbaroli, D and D.G. Gavin. 2010. Highly episodic fire and erosion regime over the past 2,000 y in the Siskiyou Mountains, Oregon. Proceedings National Academy of Science Early Edition. http://www.pnas.org/content/107/44/18909

deleterious impacts to fish, to may amend its regulations pursuant to CEQA and APA to reclassify the respective water body.

COMMENT # 32: THE DEPARTMENT FAILED TO MAKE A GOOD FAITH EFFORT TO INTEGRATE ASPECTS OF ALTERNATIVES DISMISSED (SEIR 6 P.14-16) INTO AN ACCEPTABLE AND ENVIRONMENTALLY PREFERABLE ALTERNATIVE THAT WOULD FULLY PROTECT ANADROMOUS FISHES WITH CLASS A DESIGNATIONS.

Reasoning

A motivating factor for the SEIR was a legal challenge to the existing permitting program because of impacts to anadromous fish such as federally listed Coho salmon (SEIR 1-1, 2 lines 6-8). First, the Department dismissed alternatives to the Project for reasons that are not supported by fact or law. For example, the Department asserts that its lack of information regarding whether a particular mitigation measure will completely mitigate all adverse impacts is justification for rejecting the mitigation measure and adopting no mitigation to eliminate or even reduce the respective adverse impacts of the activity. The Department's logic is faulty and its reasoning does not comply with either CEQA or Fish and Game §5653, as discussed in Comment No. 1.

In addition, the Department concluded that certain significant impacts were "unavoidable", based on its reasoning described above. However, in fact, the Department need only proscribed a certain river segment or stream as "Class A", mitigating the impact without impacting the project objectives in the least. The Department's failure to adopt such mitigation measures is wholly in violation with CEQA's requirement to adopt feasible mitigation.

Lastly, the SEIR failed to even integrate appealing aspects of dismissed alternatives (SEIR 6 p. 14-17), scoping comments (Appendix C) and Public Advisory Committee Meeting comments (Appendix G) into an alternative that could be supported by commenters. For example, an "Anadromous Fish Alternative" could have been developed which would have provided Class A protection to all streams with federally listed aquatic species (e.g. Coho salmon) as well as unlisted culturally and economically important anadromous species (e.g., Chinook salmon, Pacific lamprey, summer steelhead, green sturgeon).

Recommendation

Prohibit suction dredge mining on all rivers and streams for which the Department cannot affirmatively establish that suction dredging will not cause deleterious impacts to fish. Meanwhile, develop an 'Anadramous Fish Alternative' for evaluation. After the Department has gathered data, if it later determines that certain rivers or streams can be dredged without deleterious impacts to fish, to may amend its regulations pursuant to CEQA and APA to reclassify the respective water body.

COMMENT # 33: THE SEIR FAILED TO PROVIDE MEANINGFUL QUANTITATIVE COMPARISONS BETWEEN THE PROPOSED PROGRAM AND ACTION ALTERNATIVES. QUANTITATIVE PARAMETERS THAT ADDRESS MAJOR ISSUES NEED TO BE INCLUDED IN ADDITION TO QUALITATIVE DESCRIPTIONS.

Reasoning

Comparisons of the action alternatives to the Proposed Program are misleading and confusing (Table 6-1 and accompanying narrative descriptions). Since some streams that were previously closed to suction dredging (1994 SEIR) are now proposed to be open in Proposed Program and vice versa, it is impossible to make an informed choice about which action alternative allows more or less dredging and by how much. No useful quantitative parameter was provided to compare impacts. An obvious metric is stream miles. Stream miles with 2008 high/medium dredging intensity as listed in Appendix F and illustrated in Figure 3-5 would be an appropriate measurement for quantitative alternative comparison. Streams with no use or very low use would need to be excluded or kept in a separate low use category. A spreadsheet that illustrates dredge seasons for high/medium intensity streams and streams with anadromous fish would help readers and decision makers make a more informed decision and highlight specific areas of controversy (e.g., Dillon Creek with summer steelhead would be open to dredging in Proposed Program).

Recommendation

Develop a more reader friendly format for comparing alternatives.

COMMENT # 34: THE SEIR FAILS TO DISCLOSE THAT THE PROPOSED PROGRAM WOULD SUBSTANTIALLY INCREASE INTENSITY OF DREDGING AS COMPARED TO 2000-2008 USE LEVELS.

Reasoning

The Proposed Program would issue up to 4,000 permits which is substantially greater than the 2,500 -3,000 permits issued annually during the period 2000-2008 (See Table 3-1 p.3-3). Intensity of use can be expected to increase from 2008 use levels on high use areas such as the Scott River and Salmon River (Appendix F). Only the Reduced Intensity alternative (SEIR 6-12) can be expected to actually decrease disturbance and damage as compared to dredging impacts during 2000-2008.

Recommendation

The SEIR needs to make a quantitative comparison of the Reduced Intensity alternative with No Program to fully disclose the impact of this alternative.

COMMENT # 35: THE 500 FT. SPACING REQUIREMENT IN REDUCED INTENSITY ALTERNATIVE WOULD BE DIFFICULT TO ENFORCE AND WOULD NOT REDUCE IMPACTS TO SPAWNING SUBSTRATE.

Reasoning

The spacing requirement provides no reduction of known lethal impacts to spawning gravel. Dredgers could simply synchronize dredging up and down the stream and have the same impact on spawning substrate. Spacing could reduce temporary turbidity increases which are generally not lethal or long lasting. In actual practice, this restriction could reduce the ability of one miner to actually run two or more dredges in one location. Experienced dredgers often have an inexperienced friend or spouse accompany them so they can run two or more dredges in the same location.

Recommendation

Re-evaluate benefits of 500 foot spacing requirement.

COMMENT # 36: THE DSEIR PROVIDES NO DATA OR ANALYSIS TO DEMONSTRATE THE EFFECTIVENESS OR PRACTICALITY OF NEW REGULATIONS OSTENSIBLY DESIGNED TO PREVENT SIGNIFICANT DAMAGE TO STREAM HABITAT AND SIGNIFICANT IMPACT TO AQUATIC ANIMALS. IT APPEARS THAT MANY NEW REGULATIONS' PURPOSE IS NOT TO EFFECTIVELY PROTECT AQUATIC ANIMALS BUT RATHER TO RATIONALIZE A "LESS THAN SIGNIFICANT" DETERMINATION.

Reasoning

One of the most important regulations is the prohibition on disturbing stream banks. Despite its illegality, several studies including those by Nawa (2002)[58] found this to be the most common long-term damage caused by suction dredgers. The "less than significant impact" determinations in the SEIR rely heavily on many new and even more restrictive regulations that have never been implemented. Dredgers would now be required to dredge 3 feet inside the wetted perimeter, as if that would now deter miners from excavating stream banks. If the original regulation had poor compliance, a new and more stringent regulation is not likely to have different results. Table ES-1 identifies 17 new or expanded provisions. Determinations of "less than significant" impacts are directly dependent with compliance on many of these new or expanded regulations.

The SEIR fails to provide any data or analysis of the likely outcome when compliance is less than 100%. As noted in the dSEIR, actual studies and modeling indicate that a single miner in non-compliance with restrictions about mercury could have significant water quality effects. Many new regulations have had no analysis as to their technical

[58] Nawa, R.K. 2002. Observations of Mining Activities in the Siskiyou National Forest Riparian Reserves and Probably Impacts to Aquatic Organisms. Siskiyou Project. Grants Pass, Oregon.

feasibility and likely compliance (e.g., regulations requiring dredgers to restore the pre-mining streambed grade). In many locations the majority of the tailings will be swept downstream or most dredgers will simply ignore this requirement as has been the practice for decades. Making what is actually a best management practice (BMP) or desirable discretionary action (SEIR ES-8) into a regulation will not make it automatically happen in the real world where fish struggle to survive in degraded streams. Many regulations are actually BMPs and will be interpreted as discretionary by dredgers (e.g., avoid disturbing fish, avoid mussel beds, avoid amphibian eggs, avoid redds, avoid silt/clay etc.). These ethically and environmentally desirable precautions have been made into regulations to support "less than significant" impact determinations. If the dredgers strictly adhered to every regulation as written they would not be able to dredge anywhere in the state. The Department's Proposed Program, in true bureaucratic form, has created a system where the dredgers will have to violate some obscure regulations so they can dredge somewhere, while the paper regulations they routinely violate will be used by the Department to underwrite "less than significant" determinations. The Commenters view this as simply poor policy development by the Department.

Recommendation

Thoroughly evaluate implications of failure to achieve 100%, 75%, or 50% compliance. Consider and evaluate likeliness of compliance given the complexity of proposed regulations and ability to enforce these regulations given the limited resources of the Department.

COMMENT # 37: THE DSEIR FAILS TO FULLY EVALUATE THE DELETERIOUS EFFECTS OF DREDGE INDUCED TURBIDITY ON FISH

Reasoning

The DSEIR has critical uncertainty whether water quality and fisheries will be protected from increased turbidity (water visibility or measure of light penetration into water). Gregory et al. found that "Salmonid populations not normally exposed to high levels of natural turbidity or exposed to anthropogenic sediment sources may be deleteriously affected by levels of turbidity considered to be relatively low (18-70 NTU). Other studies reveal that "Low levels of turbidity appear to correspond to sediment concentrations that may adversely affect coldwater salmonids (Lloyd 1987)." Bash et al

The DSEIR acknowledges the need to protect streams from increased levels of turbidity, but describes no measurable limits or tangible method of protection for streams where suction dredging is allowed. The DSEIR on page 15 states that "Reasonable care shall be used to avoid dredging silt and clay materials that would result in significant increase in turbidity." This is a vague statement and not a clear restriction. The statement is simply a "recommendation" for the dredge operator to act in "good faith" to avoid actions causing high levels of turbidity and lacks the measurable elements needed to be an enforceable restriction. Turbidity is typically measured in nephelopmetric turbidity units or NTU's and requires specific instruments for measurement in a stream. A much simpler method of assessing turbidity is measuring

the depth of water visibility. However, even this method would be a difficult standard to enforce.

Increased turbidity causes a reduction in juvenile salmon growth and decreases survival. Turbidity downstream of suction dredges operation has been measured as high as 50 NTU's. Juvenile salmon survival is reduced when turbidity measurements are above 20 NTU's. Turbidity limits juvenile salmon's ability to use sight to capture food items; species such as Coho are highly dependent on sight feeding for optimal growth and survival. Increased turbidity also reduces primary production and reduces the basic food supply for salmon and other aquatic animals.

Recommendation
Suction dredging should be prohibited in streams that contain clay and silt deposits so that high turbidity can not be avoided. Where dredging is allowed, a simple method of assessing turbidity levels should be developed which allows for enforcement action.

COMMENT # 38: THE DSEIR IS NOT CONSISTENT OR COMPREHENSIVE IN DETERMINING CLOSURES FOR PROTECTION OF SPECIES LISTED UNDER FEDERAL AND STATE ENDANGERED SPECIES ACT (ESA-LISTED) AND OR BEEN DETERMINED BY ONE OR MORE GOVERNMENT AGENCIES TO BE "AT-RISK" OF BECOMING ESA-LISTED OR GOING EXTINCT. STREAMS WITH "AT-RISK" SPECIES ARE PROPOSED FOR OPEN SUCTION DREDGING.

"Where threatened or endangered species exist, managers would be prudent to assume activities such as dredging are harmful unless proven otherwise (Dayton 1998)." Harvey and Lisle

Reasoning
The designation of class A streams (year round closures) for protection of sensitive species is justified, but there are inconsistencies in locations where protection is provided. For example; on the Klamath River the DSEIR has closures on most streams with ESA-listed Coho salmon and at-risk summer steelhead, but does not on other streams where sensitive species are found. These stream include; Dillon, Red Cap, Beaver, Cade, China, Fort Goff, Little Grider, Little Horse, King, Portuguese, Stanshaw, Titus, Ukonom, and Walker Creeks.

Dillon Creek is especially of concern because it supports one of the few large populations of summer steelhead in California. At this point it seems inconceivable that California's fisheries resource protection agency, California Department of Fish and Game, would allow suction dredging in Dillon Creek given the rare fishes and known impacts to fish from suction dredging. Dillon Creek was originally closed to dredging under the 1994 regulations specifically for protection of summer steelhead. Furthermore, it was closed to fishing in 1997 for protection of summer steelhead. Since that time, Coho salmon were added to the ESA list for protection.

Recommendation

All streams open in the DSEIR should be revaluated to determine if sensitive or ESA listed species would be affected and re-classified as closure streams. Specifically for the Klamath River a class A designation should be added to **Dillon, Red Cap, Beaver, Cade, China, Fort Goff, Little Grider, Little Horse, King, Portuguese, Stanshaw, Titus, Ukonom, and Walker Creeks.**

COMMENT # 39: THE DSEIR DOES NOT HAVE RESTRICTIONS THAT LIMIT POTENTIAL FOR NEGATIVE CUMULATIVE EFFECTS WITH RESPECT TO TEMPORAL AND SPATIAL SCALE. SIMPLY, THE DSEIR DOES NOT LIMIT THE NUMBER OF DREDGES WORKING WITHIN CLOSE PROXIMITY AND OVER LONG PERIODS OF TIME. DREDGING IMPACTS SHOULD ALSO BE ANALYZED IN CONTEXT WITH OTHER NEGATIVE WATERSHED IMPACTS INCLUDING REDUCED FLOWS, POOR WATER QUALITY, HABITAT CONNECTIVITY AND HARVEST.

"no research has been dedicated to measuring the cumulative physical or biological effects of many closely spaced dredges. Cumulative effects of dredging and other human activities deserve attention, particularly where reaches are dredged year after year" Harvey and Lisle

Reasoning

The synergistic effects of habitat degradation from multiple sources, including suction dredging, compounds effects on species and puts them more at risk of extinction.

Recommendation

A comprehensive cumulative effect analysis should be completed for each stream or watershed proposed for suction dredging therefore closures could be implemented in accordance with other protection measures such as TMDL's.

COMMENT #40: DSEIR FAILS TO EVALUATE DREDGING IMPACTS ON GREEN STURGEON IN KLAMATH AND SALMON RIVERS

Reasoning

The Karuk Tribal Fisheries Program documents juvenile green sturgeon during out-migrant fish monitoring in the lower Salmon River using rotary screw traps. Trapping has been ongoing since 2001 and juvenile sturgeons are found at the trap almost every year. Adult green sturgeons have been documented in the lower 8 miles of the Salmon River, but are suspected to use higher reaches.

A Salmon River closure would protect green sturgeon that spawn and rear in the lower main stem Salmon River from Freight Train Rapid (RM 8) to the mouth. Green sturgeons enter the

lower Salmon main stem between late February and late July and spawn from March through July (see table below). Green sturgeon enter an embryo and larval stage after hatching and have no or very poor swimming ability during this developmental period which can last into September. Green sturgeon juveniles rear in freshwater for as long as 110 days before large-scale downstream migrations begin to overwinting areas. Green sturgeon juveniles are largely nocturnal in their first 10 months of life and generally remain concealed in the substrate during the day (Kynard 2005) when suction dredging would be occurring. Closure of the Salmon River main stem would eliminate the risk of entrainment, entrapment, loss of cover, or other deleterious effects of suction dredging on juvenile green sturgeon.

M = spawning migration, S = spawning, I = incubation, E = emergence, O = outmigration, R = rearing																									
	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		
Green Sturgeon			M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M						
								S	S	S	S	S	S												
								I	I	I	I	I	I	I											
								O	O	O	O	O	O	O	O	O	O	O	O	O					
								R	R	R	R	R	R	R	R	R	R	R	R	R					

Comments on CDFG Draft SEIR for Suction Dredge Mining Regulations Relating to Freshwater Mussels

COMMENT # 41: THE DSEIR FAILS TO FULLY EVALUATE IMPACTS TO FREWSHWATER MUSSELS; DRAFT REGULATIONS FAIL TO PREVENT DELETERIOUS IMPACT ON FRESH WATER MUSSELS

Reasoning

Freshwater mussels, besides providing valuable ecosystem services in freshwater environments are also culturally significant for native peoples in the State of California. This fauna historically formed an important part of the diets and material culture of indigenous peoples statewide, including members of the Karuk Tribe [59,60]; mussels continue to provide part of the traditional diet for some tribal members in the present day.

There are few comprehensive surveys and little basic knowledge of ecology, life history, genetics, taxonomy, or zoogeography of mussels in the Western United States.[61]

[59] Kroeber, A.L., and S.A. Barrett. 1960. Fishing among the Indians of northwestern California. University of California Press: Berkeley, CA

[60] Ferrara, J., editor. 2004. Ananakupheekxunnikich: Karuk ethnographic notes as spoken principally by Phoebe Maddux, and heard and written in the years 1926-1929 by J.P. Harrington. Karuk Tribe of California: Happy Camp, CA.

[61] Brim Box, J., J. Howard, D.Wolf, C. O'Brien, D. Nez, and D. Close. 2006. Freshwater mussels (Bivalvia: Unionoida) of the Umatilla and Middle Fork John Day Rivers in Eastern Oregon. Northwest Science 80:95-107.

However, with what little we do know, it is possible for managers to act now to preserve these key components of freshwater ecosystems. It is already known that some Western mussels, including some anodontines and *Gonidea angulata*, are likely to have been extirpated from parts of their former ranges due to human activities.[62,63]. Howard (2010) provided a recent synthesis of historical observations of mussel populations in California. Howard's 2010 synthesis, covering all ecoregions and major drainages in California and including follow-up snorkel surveys of historical sites, concluded that all three genera of Western mussels, *Gonidea, Margaritifera* and *Anodonta*, are in decline statewide, with populations completely extirpated from some drainages[64].

Given the ecological importance of mussels and their declining status, any management action that is likely to disturb mussels or their habitat warrants caution, particularly because there are so few in depth studies—four or five at last count—of how serious benthic disturbances such as dredging could affect mussels. Additionally, none of the existing studies on dredging actually took place in California rivers. In the Klamath River alone, freshwater mussels only emerged as an object of scientific study four years ago. The current regulation to avoid dredging in mussel beds, while well-meaning, does not go far enough to protect these declining species about which we know so little. It will be difficult for miners to comply with this regulation (for those who even attempt compliance) and difficult if not impossible to enforce by The Department.

The DSEIR briefly cites a 2007 study by Krueger *et al.* which studied the short-term effects of suction dredge mining on mussels in two rivers in Washington State, pointing out that none of the mussels in the study died from entrainment in the suction dredge experiments. However, besides this one point which the DSEIR has spun in the favor of dredge mining, CDFG completely fails to note the other major findings of the study, which revealed that, although entrainment alone failed to kill mussels, a significant percentage of mussels used in the experiments died in the process of attempting to excavate themselves from burial in piles of dredge tailings. Krueger *et al.* point out that the study only looked at the effects on mussels over 48 hours and did not investigate long-term mortality. Many mussels used in the experiments, while still alive, had not managed to excavate themselves from the dredge tailings after 48 hours, and the authors note that it is possible these mussels would have died over the longer term. In addition, the authors note that their study was not comprehensive in that it did not investigate the effects of dredging on juvenile mussels, which are presumably more sensitive to the

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[62] Nedeau, E., A.K. Smith, J. Stone , S. Jepsen. 2009. Freshwater Mussels of the Pacific Northwest, 2nd Edition. The Xerces Society, Portland, OR.

[63] Krueger, K., P. Chapman, M. Hallock, and T. Quinn. 2007. Some effects of suction dredge placer mining on the short-term survival of freshwater mussels in Washington. Northwest Science 81: 323-332.

[64] Howard, J. 2010. Sensitive Freshwater Mussel Surveys in the Pacific Southwest Region: Assessment of Conservation Status. Final report. Prepared by The Nature Conservancy for USDA Forest Service, Pacific Southwest Region, 1323 Club Drive, Vallejo, California.

effects of entrainment and burial as they are much smaller and have much thinner shells than their adult counterparts. The Krueger study pointed out that all the mussels that succeeded in excavating themselves from dredge tailings in one river were larger mussels than the mussels in a different river that did not succeed in excavating themselves. This suggests to me that large, old mussels have an advantage in removing themselves from piles of dredge tailings, and that dredging would in effect "select" for larger mussels while killing a percentage of younger mussels through burial—something which could have drastic longer-term effects on mussel populations.

Krueger *et al.* did not study the effects of dredging on thin-shelled species of mussels such as those in the genus *Anodonta*, but only the effects on the (very) thick-shelled species *Margaritifera falcata* and *Gonidea angulata*. Even these thick-shelled species had some difficulty in excavating themselves from dredge tailings, resulting in mortalities. Researchers note that these thick-shelled species can withstand a certain amount of scouring during high flows (Nedeau *et al.* 2009), so it makes sense that they could survive entrainment in a dredge with a quantity of gravel and rubble substrate. *Anodonta spp.*, however, has a much thinner shell and cannot withstand any scouring.[49] Species in the genus *Anodonta* are currently present in the Klamath, Shasta, and Scott rivers, and it should be noted that one, *A. californiensis*, is a species of special concern in California. Krueger *et al.* also caution that dredging up mussels and burying them or washing them downstream in the current and hence changing the spatial orientation of mussels to one another, could have negative implications for mussel reproduction, which often depends on a specific density ratio of males to females, as well as proximity of one mussel gender to the other[65]

Overall, the DSEIR failed to include the major conclusion of the Krueger study, which was that, because aquatic ecologists currently know so little about the effects of dredging on mussels, managers should use the precautionary principle in dredging regulations.

While *Anodonta spp*. may be more sensitive to entrainment by dredging due to its thin shell, *M. falcata* may be sensitive to burial under tailings due to its noted sensitivity to sedimentation. Vannote and Minshall observed that in the Salmon River, Idaho, which underwent sedimentation in the last century due to large-scale hydraulic mining and other land use practices, the mussel fauna had undergone a community composition shift from a fauna dominated by *M. falcata* to one dominated by *G. angulata*. They noted dead relict beds of *M. falcata* buried under decades' worth of sedimentation. Their follow-up experiments found *M. falcata* to be somewhat more sensitive to burial than *G. angulata*. This sensitivity to burial and sedimentation suggests that dredging could be proportionally more detrimental to *M. falcata* than to other species.[66] It should be noted

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[65] Amyot, J.P, and J.A. Downing. 1998. Locomotion in *Elipto complanata* (Mollusca: Unionidae): a reproductive function? Freshwater Biology 39: 351-358.

[66] Vannote, R.L., and G.W. Minshall. 1982. Fluvial processes and local lithology controlling abundance, structure, and composition of mussel beds. Proceedings of the National Academy of Sciences of the United States of America 79:4103-4107.

that, at least in the Klamath, *M. falcata* is relatively rare and has a restricted range compared to *G. angulata*. In addition, *M. falcata* may already be more at risk in certain drainages due to its sensitivity to pollution and its need for declining salmonid host fish to complete its life cycle (Nedeau *et al*., 2009).

Any restrictions on mining in mussel beds will be difficult to follow for those dredge miners who actually concern themselves with compliance. Furthermore, how does CDFG propose to enforce the regulation against mining in mussel beds? Will all proposed mining locations be pre-scoped for the presence of mussels by a CDFG agent, or will miners need to follow these regulations on the honor system? Mussels are cryptic and difficult for anyone, including miners, to see, even when located in large, dense, relatively easier-to-observe beds. However, mussels are not always distributed in large, dense, easy-to-observe beds. In the Klamath, Salmon, Scott and Shasta Rivers, mussels are observed frequently, but often not in large concentrations—a sparse, "patchy" distribution. They are difficult to observe under turbid or high water conditions without knowing what you are looking for. The regulation preventing miners from dredging in mussel beds will almost certainly not prevent them from entraining and burying the many sparsely dispersed mussels not located in dense beds on the surface or easy-to-see areas such as sandy bottoms (as opposed to wedged into and underneath bedrock cracks, a popular place for miners to obtain gravels). This includes juveniles, which are almost always buried and near-impossible to see in the field with the naked eye. In the Karuk Tribe's 2009 study of mussel population age structure in the Klamath River, we found that a large percentage (approximately one-fourth) of freshwater mussels occur beneath the surface of the benthos, burrowed up to six inches into the substrate and not visible to the eye of a trained scientist, let alone a miner.

A recent study by the US Geological Service in California's South Yuba River found that there is a strong link between suction dredge mining and the release of mercury into the aquatic environment,[67] which could negatively affect mussels. In areas such as the Sierra Nevada and the Klamath Basin) where historical large-scale hydraulic gold mining washed huge quantities of upslope sediment into the riverbeds, contemporary suction dredge mining disturbs fine particles of sediment that contain mercury (Fleck *et al.* 2011). The mercury gets converted into methylmercury, a highly neurotoxic compound, which then enters the food chain (Fleck *et al.* 2011). Because fine grained sediment is more likely to be carried downstream, disturbance of these kinds of sediment while dredge mining likely increases the concentration and amount of mercury downstream; the researchers found elevated concentrations of methylmercury in invertebrates collected from the study area compared with invertebrates from another site relatively unaffected by historical gold mining operations (Fleck *et al.* 2011). Mussels, as sedentary filter feeders often comprising the majority of the biomass in aquatic ecosystems, would be one of the first organisms to uptake and bioaccumulate methylmercury as it worked its way

[67] Fleck, J.A., et al. 2011. The Effects of Sediment and Mercury Mobilization in the South Yuba River and Humbug Creek Confluence Area, Nevada County, California: Concentrations, Speciation and Environmental Fate—Part 1: Field Characterization. U.S. Geological Survey Open-File Report 2010-1325A, 104 p.

up the food chain. This is a concern not only for the mussels themselves, but also for the repercussions through the food web for the many organisms, which forage on mussels, such as muskrat, beaver, mink, otters, and humans. Freshwater mussels have been a traditional food item for the indigenous peoples of California including the Karuk Tribe for thousands of years; while historically comprising a significant portion of the diet, they are now consumed by Karuk tribal members around ceremonial times of the year. Potential bioaccumulation of methylmercury in freshwater mussels would be a threat to any tribal members consuming mussels, particularly children, pregnant women, or women about to become pregnant.

Finally, managers should recognize the potential impact of suction dredge mining to mussel fish hosts and their habitat. Mussels use fish as hosts during a parasitic larval stage before metamorphosing into juveniles and dropping to the substrate; they cannot complete this life stage without their host fishes and are sometimes dependent on a certain host species rather than being able to use several species. If dredge mining reduces or degrades habitat for host fishes or causes fish mortality, this could negatively impact mussel reproductive success.

In summary, the many factors that warrant caution against dredging, where mussels are concerned, include: the documented decline of mussel populations statewide, the status of *A. californiensis* as a species of special concern, the known sensitivity of *M. falcata* to the sediment-disruption produced by dredging, the unknown effect of dredging on juveniles or thin-shelled species, the observed mortality by burial of mussels in dredging experiments, the low potential for compliance and enforcement of the proposed regulation, the known detriment to fish hosts by dredging, and the high potential for release of mercury into the aquatic food web. Given these many red flags, it seems prudent at this time to use the little we know to protect mussel populations via banning dredge mining. To benefit freshwater mussels along with all other benthic invertebrates and sensitive fish species in California fresh waters, I highly recommend that CDFG maintain a complete ban on suction dredge mining in streams, rivers and lakes.

Recommendation

Ban dredge mining in all fresh water mussel habitat.