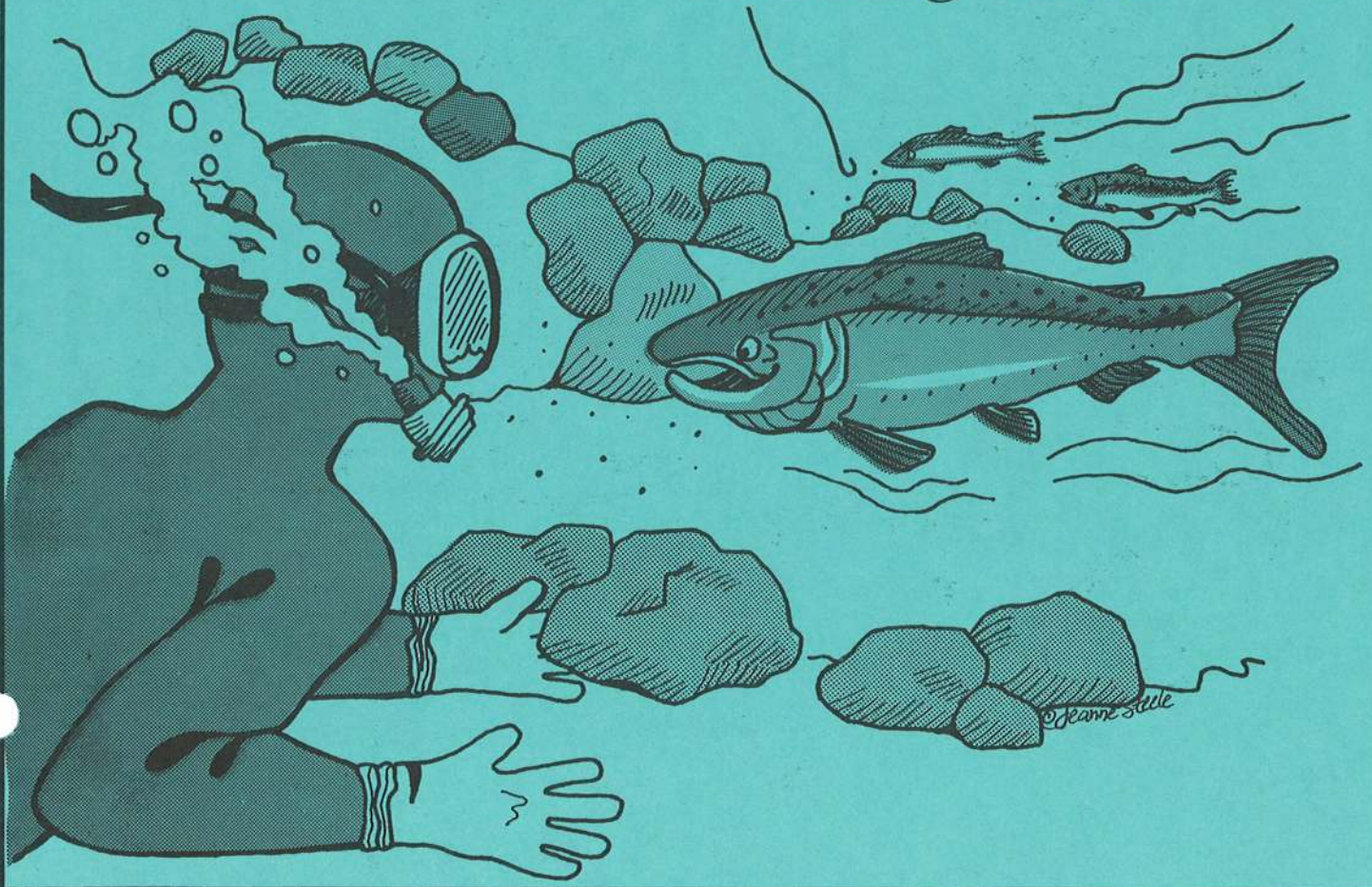


*A Gold Dredger's Primer  
to Survival in a Shrinking World*





**This booklet is not about dredging for gold, it is about the future of gold dredging:**

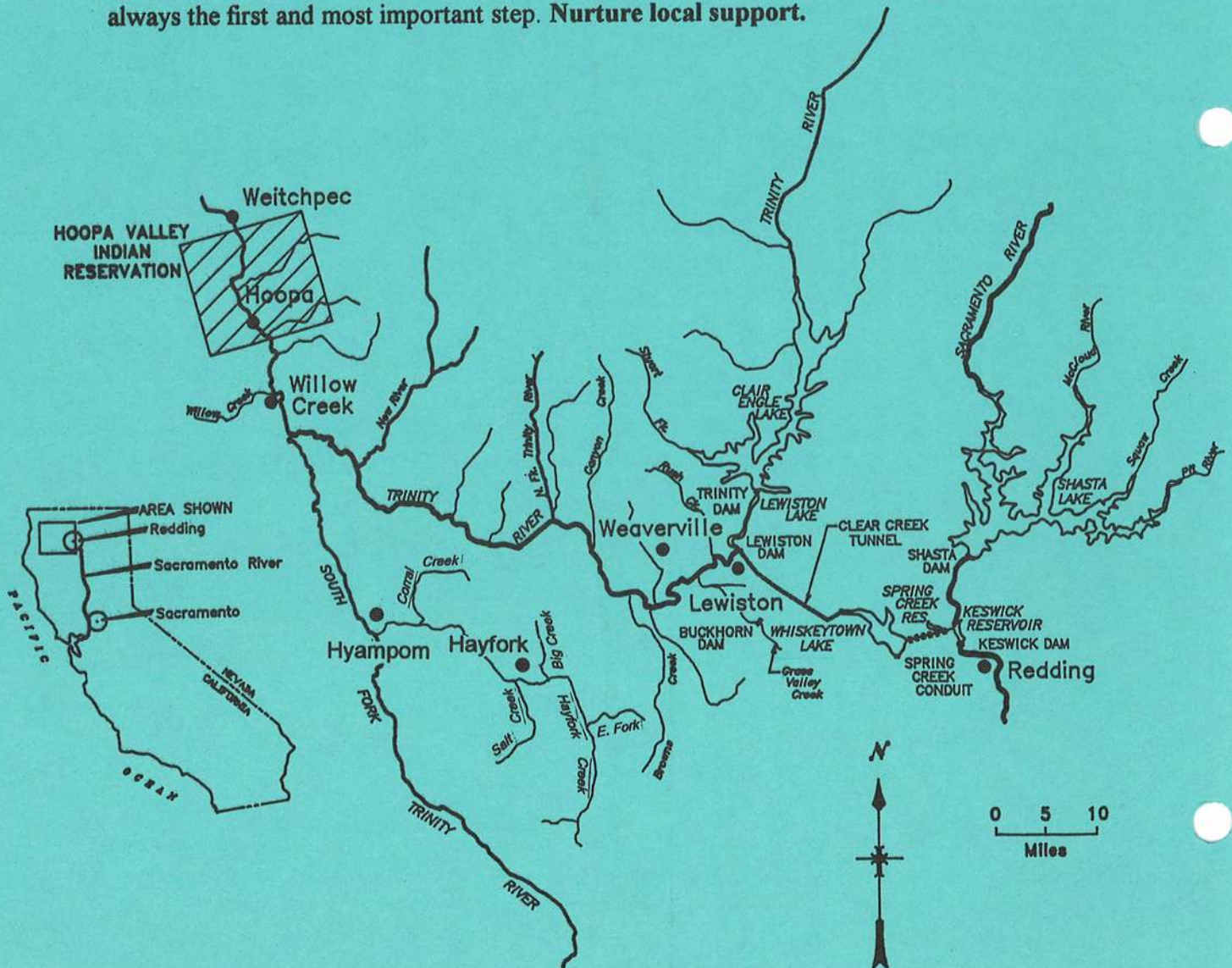
### **WILL THERE BE ONE?**

The answer may lie in our individual and collective ability to respond to our changing world.

#### **Key Ingredients:**

- **Political and environmental awareness**
- **Compatible practices**
- **Public relations: Public AND Peer education**

Though the discussion within is focused on the Trinity River Basin, suggestions for compatible practices are relevant to all California waterways. Local conditions will require different priorities; obtaining the support of your local community and local agencies is always the first and most important step. **Nurture local support.**



## Table of Contents

Our Place in the Big Picture .....	1
Fish = \$\$\$ and Jobs .....	2
How Dams Affect the Trinity River.....	2
A Little Fish Biology.....	5
Other Reasons for Dredge Closures .....	7
Special Permits .....	8
Some Practices to Keep in Mind.....	8
Keep it Underwater .....	9
Protect Streamside Vegetation.....	9
Prevent Spills.....	10
Tailings Etiquette .....	10
Courtesy: Be a Model of Multiple-Use .....	11
§ 1603 Agreements .....	12
§ 404 Permits: The Shape of Things to Come .....	12
Fish Habitat Improvement Projects.....	13
Be Part of the Solution .....	14
The Next Generation .....	15

### A Gold Dredger's Primer to Survival in a Shrinking World

Written and Edited by Lynn Gunn-Morrison

Illustrated by Jeanne Steele

with special thanks to "Computer Dave" Smith

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The author welcomes all comments, criticism and ideas.

*Sink or swim, we're in this boat together.*

Contact me at: P.O. Box 531 Big Bar, CA 96010 (916) 623-8636 or (916) 496-3166

Funded by the Trinity River Task Force through the U.S. Bureau of Reclamation & Trinity County



**From a human perspective, the world IS shrinking.** The combined pressures of technology and population create an expanding appetite for a shrinking resource base.

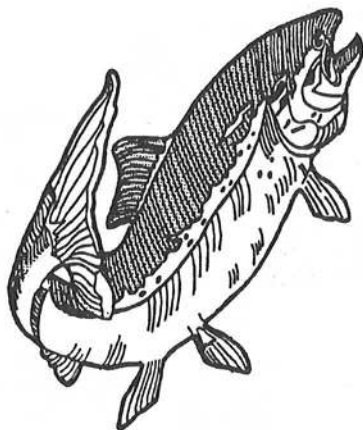


As competing interests jockey for political correctness, will gold dredgers survive the multiple use battles? Surely every other user group has more registered voters and better financed lobbyists than small-scale independent miners.

Gold dredgers are perhaps in a unique position of being able to mitigate some of the adverse impacts of other human activities. Removing toxic heavy metals is one example. Every dredger removes pounds and pounds of submerged lead from lost fishing weights and gun shot every season. Many dredgers recover quantities of mercury lost from historic mining operations.

Especially on the popular white water rivers of the Motherlode, dredgers remove unbelievable amounts of submerged debris, the legacy of the hundreds of thousands of annual white water enthusiasts.

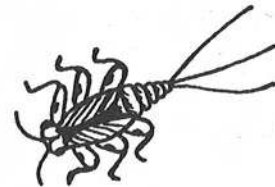
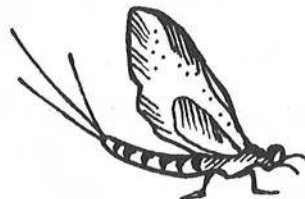
But most importantly, dredging can clean and stratify the cemented gravels ever present throughout the extensive system of dams and diversions of California's rivers. Providing clean, loose gravels improves salmonid spawning and rearing habitat, and the habitat of the bottom dwelling invertebrates on which they feed. Current dredge operations release the impacted fines from the cobble substrate, depositing it as a surface layer which can be quickly mobilized by high flows. With minor modification, standard dredging equipment can be used to separate and transport the fine sediment out of the flood plain.



The Trinity River Basin Fish & Wildlife Restoration Task Force has acknowledged that potential benefits to fish habitat can result from compatible dredge practices. They have made a commitment to encourage miner education and cooperation as an alternative to more restrictive regulation.



This is our opportunity to **be part of the solution**, to put our best foot forward, and secure our niche in the stewardship of our public lands.



# The Sacramento Bee

1993 THE SACRAMENTO BEE

NOVEMBER 18, 1993

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## Waterways deteriorating badly, report says

By Jim Mayer  
Bee Staff Writer

On the compact Smith River near the Oregon border, timber cutting and gravel mining are blamed for declining salmon.

Along California's share of the Colorado River, more species are near-

government report released Wednesday.

"Our rivers are broken, and I mean just about every river in the state," said Diana Jacobs, an ecologist and principal contributor to the State Lands Commission report.

Jacobs, who has made a career studying California streams, said the

"It was surprising and heart-breaking," Jacobs said.

The Lands Commission is a state agency with jurisdiction over tide-

San Francisco Chronicle

the docu- ivers: A public ly ap- atural

released, Sen. Mike Thompson, D-St. Helena and chairman of the Senate Natural Resources and Wildlife Committee, said he would hold hearings on the issue in Northern and Southern California.

The report itself does not contain recommendations on what should be done to arrest the decline of rivers or

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From other shed it of stre:

## U.S. Puts Strict Limits on West Coast Salmon Fishing

By Richard C. Paddock  
Los Angeles Times

With the western salmon population in steep decline because of the steady degradation of its fresh-

son for the salmon's decline is the destruction of its spawning grounds—in some cases hundreds of miles from the ocean. But the agency is powerless to protect the salmon except by limit-

ing industry from Morro Bay to Eureka is facing collapse, with many fishermen predicting they will be unable to make a living from the limited season adopted

ter streams throughout the West. The fry swim downstream to the ocean. Several years later, at the end of their lives, they return to spawn in the same streams where

tures to rise to levels that are lethal to salmon eggs.

"You can't keep destroying rivers and forests and have salmon," said Zake Grader, executive direc-

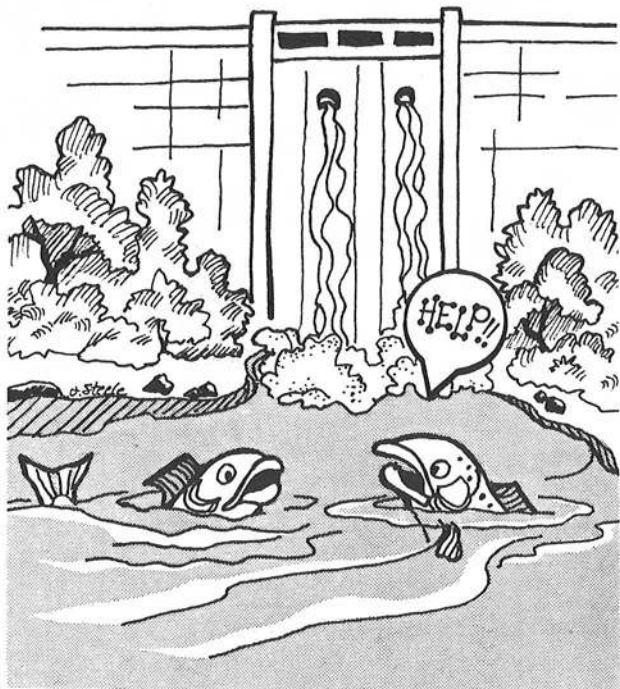
fishing will be permitted all se from the Mexican border to Arena, 100 miles north of Francisco.

The once legendary runs of salmon throughout the Pacific Northwest have diminished to the point of endangerment. The recovery and sustainability of these native fisheries must become a foremost concern to every California dredger.

### Why? Because Fish = \$\$\$ and Jobs

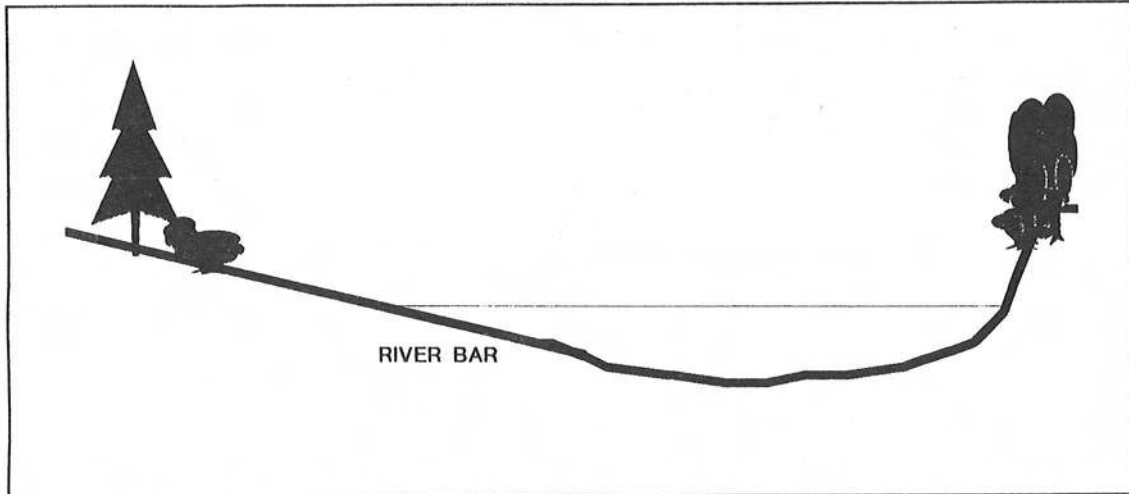
The commercial salmon fishery in California is a 100 million dollar a year industry. Every year, more and more commercial fishermen are regulated out of business, and the maze of sport fishing regulations increases. Yet the numbers of fish continue to decline. For many Native American tribes, the annual salmon harvest has always been a cornerstone of their culture... one that is now rapidly vanishing.

What has caused this perilous decline is a combination of complex factors. Yet it is clear that meaningful recovery of this resource will not occur until the effects of dams - the impoundment and diversion of water - are fully understood and effectively resolved. Our challenge is to find a way to receive the benefits of dams, and sustain and restore the aquatic environment.



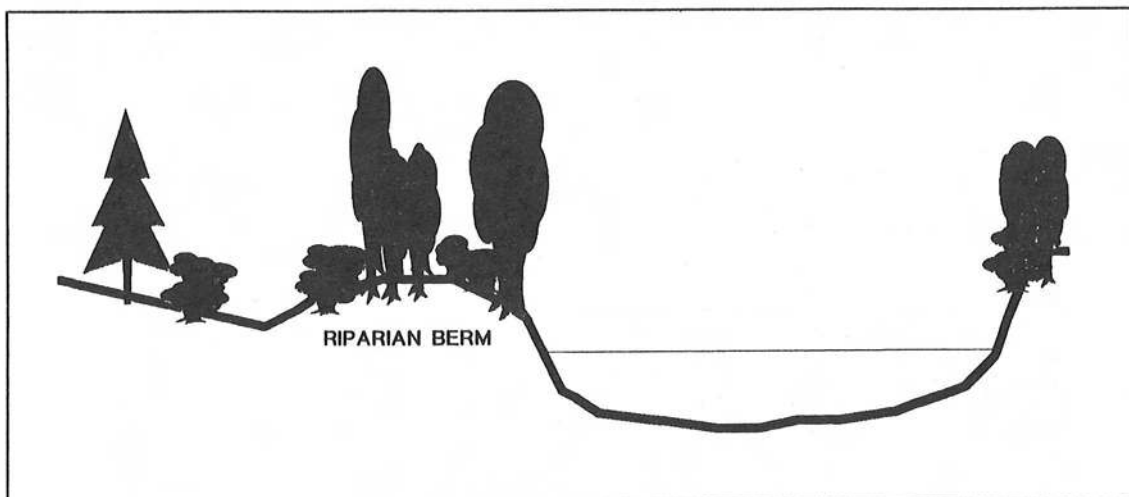
The completion of the Trinity and Lewiston dams in 1963 cut off fish access to most of the historical spawning and rearing habitat in the watershed. Dams usually serve to store water, control releases and produce electricity. But unlike most projects, water from the Trinity is actually transported out of the basin into the Sacramento Valley. Currently about 3/4 of the annual flow of the Trinity River never gets below Lewiston.

Before the dams were constructed, the Trinity, like all rivers in the Pacific Northwest, experienced annual random flooding as the spring run-off raced to the sea. These "flushing" flows would mobilize the riverbed, tumbling and stratifying the gravels, lifting the fine sediments and sifting and concentrating the heavier particles. The forces that created gold deposits, annually scoured and re-formed the natural gravel bars.



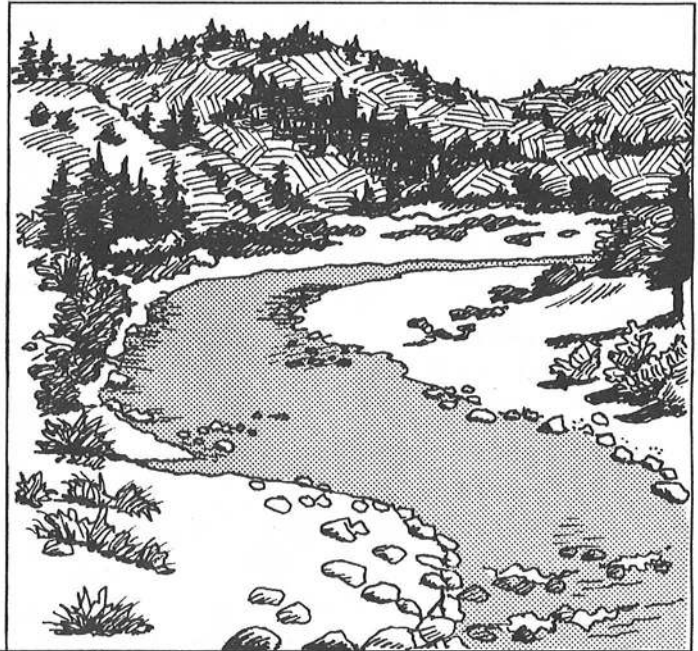
**A. Before Dam Construction: Cross-Section of Natural Historic Trinity River Channel**

The absence of these natural winter/spring "flushing" flows, combined with unnaturally stable flows maintained throughout the summer, has allowed prodigious volumes of sand and silt to fill holes, smother the gravels, cement the riverbeds, and "accrete", or build up the banks. The bank-deposited silt encourages dense riparian growth - willows, berries, alders - which encourages further deposition. And the cycle continues, so that the once gently sloping rock and gravel bars have been replaced by steep "berms" of sand.



**B. After Dam Construction: Cross-Section of Modified Trinity River Channel**

**C. An unregulated Trinity River: the banks are open and gradual due to the effects of random flooding. Natural gravel bars and pool/riffle combinations provide a wide selection of various types of habitat. See diagram A.**



**D. Since dam construction: the banks build up with silt and close in with overgrown riparian vegetation due to reduced and controlled water flows. The shape of the river becomes uniformly channelized and lacks habitat diversity. See diagram B.**

Notice that while this overhanging vegetation is a sign of a choked-up main stem RIVER, it is a vital characteristic of a healthy tributary CREEK. See discussion on page 9.

In addition, many human activities have accelerated erosion in the tributaries, multiplying the amount of sediment entering the mainstem and magnifying the effects of controlled flows.

The result is a profoundly modified river channel, nearly devoid of the historic, wide gravel bars and sediment-free riffles that provided habitat for the food base, as well as the various life stages of the once famous salmon runs of the Pacific Northwest. In less than 30 years, the Trinity dams have entirely altered the landscape that these species have depended on and adapted to for thousands of years.



## A LITTLE BIOLOGY IS NECESSARY...

Because the health of the fishery is of major concern in the debates over California's waters, the future of gold dredging is inseparably tied to the successful recovery of the fishery.

These are terms you will hear frequently:

- **Salmonid** (sal mon' id) - a group of cold water fish, including salmon, steelhead, trout, and char.
- **Anadromous** (uh na' druh mus) - means "up running", refers to fishes which spend part of their lives in the ocean, but return to fresh water to spawn. Includes salmon, steelhead, sturgeon, also pacific lamprey ("eels").

**In the Trinity**, the major species of concern at this time include the chinook (also called king) salmon, the coho (also called silver) salmon, and steelhead trout. These are *anadromous salmonids*.

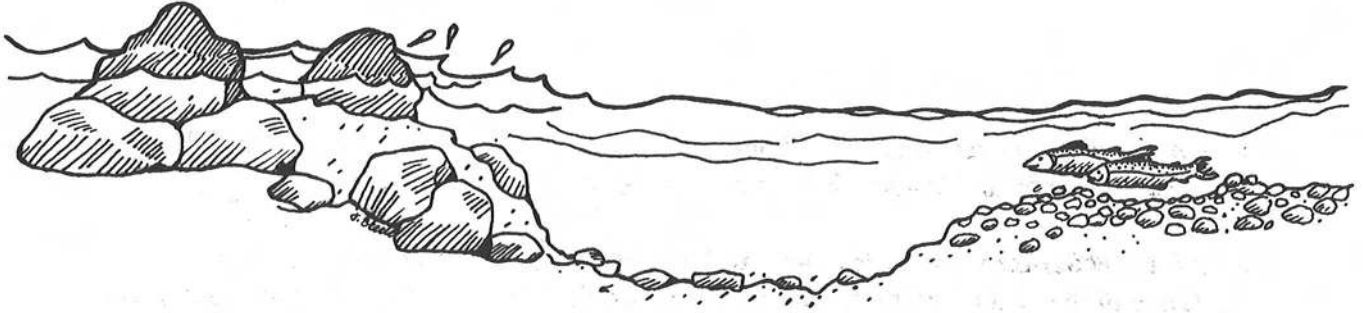
Most salmon and steelhead begin to migrate upriver anytime from April through October, but spawning takes place mainly from September through December. Some Steelhead spawn through April.

Spawning salmonids require clean, coarse gravels, with adequate water velocity to "oxygenate" the eggs, which the female buries in a nest called a "**redd**".



The size and depth of the redd varies (for king salmon, it may be 18" deep and 6' across), but it is almost always clearly visible during the active spawning period. Usually, but not always in shallow water, it will appear as a round or oval depression where the gravels are cleaner or brighter.

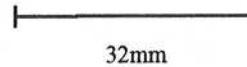




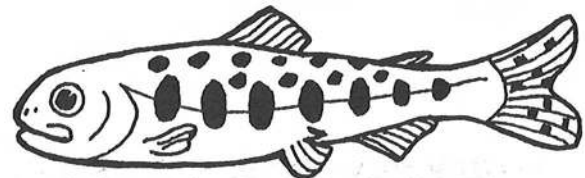
Studies have shown that spawning salmon select areas of coarse gravel (less than 6" in diameter) where the water depth averages 1-2 feet. Water velocity at these sites will be 1-2 feet per second. Float an object on the surface: it would travel about 5 to 10 feet in 5 seconds. Preferred areas include shallow gravel bars covered by fairly rapid flow, and the back section of a pool, where the riverbed begins to crest toward the riffle.



**"Yolk sac fry" working their way up through the gravels are especially vulnerable. By the time they reach the surface the yolk should be absorbed, and the tiny, transparent fish will be free-swimming and about this long:**



Variously referred to as juveniles, alevins, or smolt, the young salmonids begin to "grow" their way downstream to the ocean. We see these little guys feeding at the working face of the dredge hole and off the end of the sluice.



Depending on the water temperature, the eggs will hatch in 50-70 days. Each tiny fry has an attached "yolk sac" which it feeds from during the 35-45 days it takes to work its way to the surface of the gravel. At the surface it becomes free-swimming and can begin to feed. Any disturbance to the redd before the fry become free-swimming (even wading through it) may kill the developing fish.

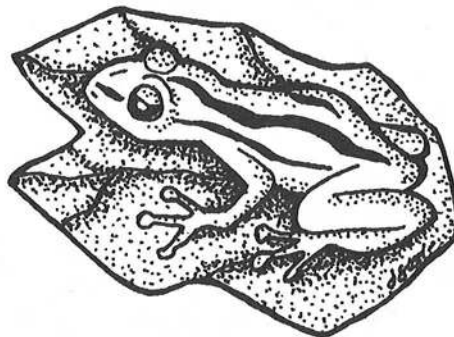
- **Eggs or yolk sac fry that get sucked through a dredge will probably die.**
- **Tailings or sediment deposited on the redd could cut off the flow of oxygen and suffocate it; or could trap the fry, causing them to starve to death.**

Most dredge season closures mandated by the California Dept. of Fish & Game (CDFG) are designated to avoid these potential impacts that could interrupt the fish life cycle.

**Learn to recognize redds** and avoid operating in the vicinity. Remember: even walking on a redd or depositing visible silt on it may cause increased fish mortality.

**Learn to recognize those areas likely to be selected** by spawning fish, and avoid operating in the vicinity in the spring (in the higher elevations, up to and through July). By the time the fry are hatched and still emerging (perhaps their most vulnerable time), the redd will no longer be clearly visible.

Fortunately, the water depth and velocity that favors deposition of gold, is the opposite of that which creates ideal spawning habitat. But as every gold dredger knows, each site is unique. **Evaluate your site for local spawning conditions, and avoid operating around likely spawning areas until any potential fry are sure to have emerged.**



### **OTHER REASONS FOR CLOSURES**

Spring salmon and summer steelhead enter the river during spring flows when the higher water levels allow them to reach the upper elevations of the tributaries. Here they hold over in deep, cold water pools until the fall spawning activity begins.

The largest populations of summer steelhead remaining in California are found in the North Fork Trinity and the New River. Though these particular populations have been increasing, spring/summer run populations in general have dwindled to alarming levels. Because disturbances may affect their viability to spawn, some streams are listed as closed year round to dredging.

Streams are also closed year round to protect **Threatened and Endangered** species.

**Special permits may be issued in these areas on a site-specific basis.**



## SPECIAL PERMITS

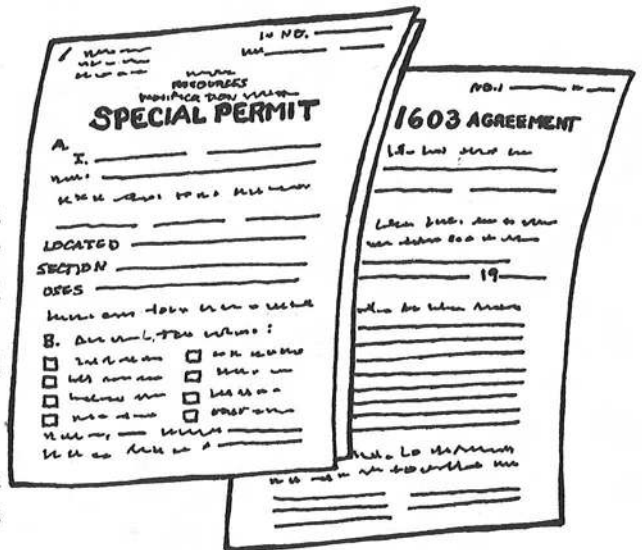
Special permits are reviewed and approved on a case-by-case basis where site specific conditions, or agreed upon performance standards and mitigation measures will meet the purposes of the closure. They may be obtained to operate on a "closed" listed water or with a larger than designated intake.

For instance, it is possible to dredge in a stream during a period closed to protect spawning if it is clear that no spawning is occurring at the specific site or within a downstream distance that may be affected. Some stretches of stream are obvious candidates. Even so, if it is your intention to operate in late spring, it would be sensible to submit your application for special permit in the fall, when it is more easily determined whether or not spawning is taking place.

Actual studies of suction dredges operating over long stretches of stream found that the density and distribution of holding adult fish were not affected. An infinite combination of geologic, hydrologic and biological factors create widely varying conditions from one site to the next. This is why case-by-case review is appropriate, especially where prior existing rights have been established.

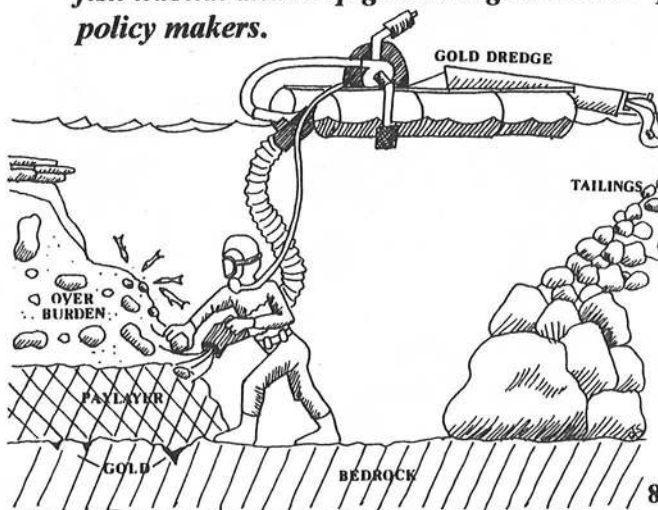
Winching or dredging activity that will affect an area outside the wetted perimeter of the stream may require a § 1603 Agreement (see p12).

If you would like help through these processes, contact your local mining organization, or this author.



✧ ✧ ✧

*There are many common sense, and economically feasible practices that will protect fish habitat and keep gold dredgers on the "politically correct" side of both public and policy makers.*



- Operate within the wetted perimeter
- Protect streamside vegetation
- Prevent spills
- Control tailings
- Be considerate of other users

## OPERATE WITHIN THE WETTED PERIMETER

Never winch boulders or log debris out of the water or place them in a position that could deflect high flows in a manner that may cause bank erosion (See discussion regarding § 1603, page 12).

Never undermine the bank, or winch boulders or large debris that are anchored into and protruding from the bank. These provide important cover and feeding places for fish.

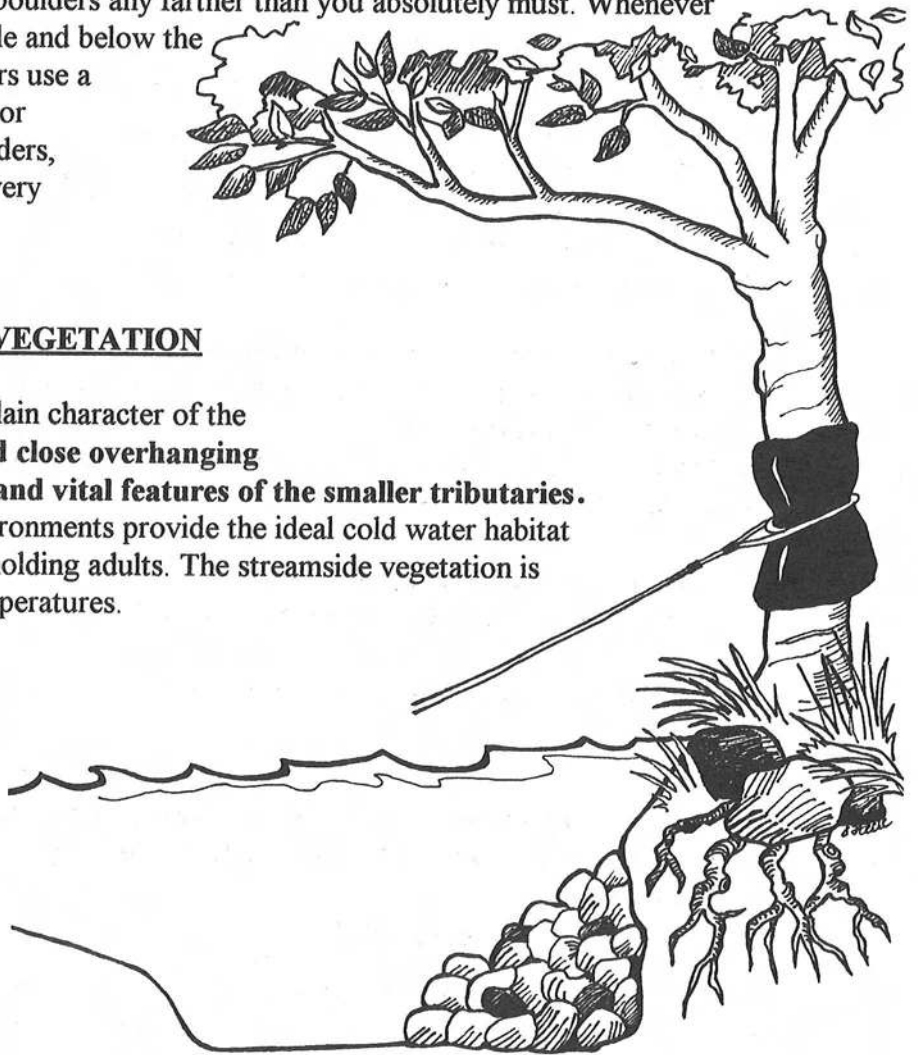
It just isn't economic to move boulders any farther than you absolutely must. Whenever possible, keep them in your hole and below the riverbed surface. Some dredgers use a separate float mounted winch, or pressurized barrels, to lift boulders, then set them back in place. Every site has its own limitations.

**First: be safe.**

## PROTECT STREAMSIDE VEGETATION

In contrast to the open, floodplain character of the mainstem, earthen banks and close overhanging riparian growth are natural and vital features of the smaller tributaries. These very different creek environments provide the ideal cold water habitat for both rearing juveniles and holding adults. The streamside vegetation is critical to maintaining cold temperatures.

If there is any chance that your activity may place the vegetation or bank at risk of collapsing during winter flows, take the time to stack your cobbles at the base of the steepened bank or exposed roots to provide an armoring or riprap effect.



When anchoring cables to trees, wrap the trunk with an old inner tube or insert the cable through an old hose to protect the tree. Always remove any cables and ropes when your operation is complete.

Whenever possible, refrain from camping in the riparian zone. Keep trails and other clearings to a minimum.



## PREVENT FUEL OR OIL SPILLS

Many other river recreationists express concern about the use of petroleum products around the river. Of course, the amount of fuel used by a dredge is miniscule compared to the amount of petroleum products consumed and exhausted by the boats on the lake, and the many cars and trucks winding along the river, but that's the **WRONG** answer. The optimal response is to meet this concern squarely.

**ALWAYS** make certain your dredge is outfitted with an oil pan. If it wasn't manufactured with one, have one made. And write to the manufacturer and let them know the importance of making it a stock item.

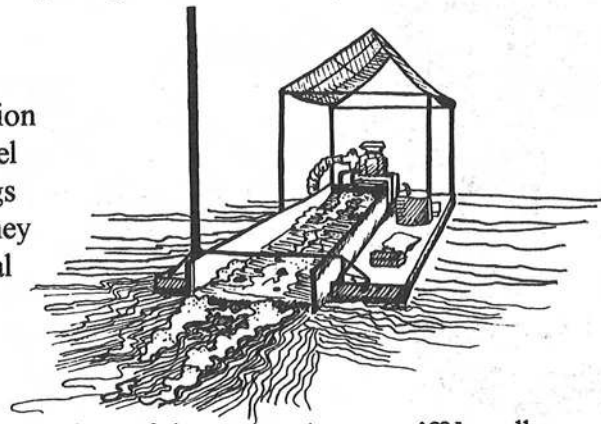
In the event of a spill, never use liquid soaps or detergents to disperse the oil/fuel. This practice is illegal and increases the fine that can be imposed because it is more damaging to aquatic life and much harder to clean up.

**An ounce of prevention** is worth a pound of cure, not to mention good public relations. Bought directly from the manufacturer, a 16" x 20" polypropylene pad (more like a towel) costs less than 50¢ and floats on the surface absorbing up to 16 oz. of petroleum based liquids, but repels water. Leave one around your gas tank when refueling. These are really handy around the shop and when working on your vehicles, too. Call your dredge supplier or this author for more information.

**DON'T LET TAILINGS JUST HAPPEN:** as much as possible, plan their placement.

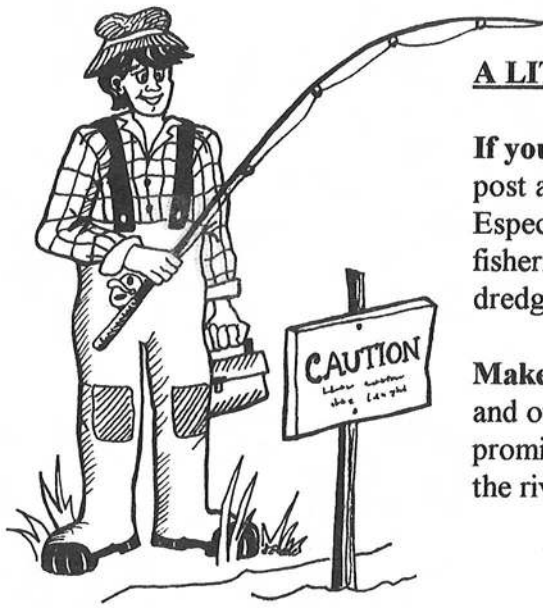
Don't let tailings or cobble piles obstruct passage of other users (boaters, rafters ,etc.) Always leave well placed chutes.

Never stack cobbles or tailings on or near the bank (See exception, illustration page 9). Remember that the water level will drop as summer advances. Tailings on the banks are not only unsightly, they are less likely to be flushed by seasonal flows, and could remain for years afterward. Avoid building ugly monuments to gold dredging.



Distribute tailings before they break the surface of the water. A **rear stiff leg** allows you to pivot the back of the dredge, making it easy to "fan" the tailings.

Consider methods to mitigate exposed tailings: hydraulic the piles flat with your blaster; extend a tailrace off the end of your sluice to flume tailings farther away; drag a boulder through the pile into your abandoned hole.

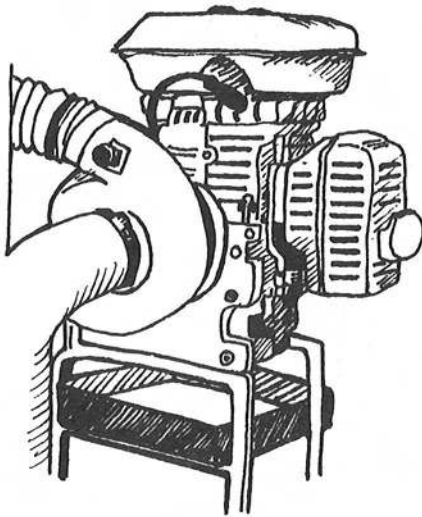


### A LITTLE COURTESY CAN GO A LONG WAY

If you have left pockets in an area popular with fishermen, post a prominent notice warning of submerged pockets. Especially on the Klamath, where visibility is usually poor, fishermen have reported close calls when they fall into dredge holes wearing waders.

Make sure your ropes and cables do not obstruct boaters and other users. They should be clearly visible or prominently flagged, and allow safe passage. Lines that span the river should be a minimum of 6' off the surface.

One of the most common complaints mentioned by other users is engine noise. Make sure your engine is fitted with an appropriate muffler. Some may consider exhausting underwater, similar to an outboard. Every step you take to maintain a quieter running engine can only improve relations with other river users.



Sanitation should always be self contained, and disposed at an approved dump.

Keep your site squared away. When it comes to public relations, appearances can be everything. Try to keep it picked up and orderly. Clean up after yourself.

Be open and courteous to recreationists and other users. Support multiple use of our public lands: demonstrate that there's room for all of us.





## § 1603 AGREEMENTS

Operating into a gravel bar, moving boulders out of the stream, or any activity that would substantially alter the bed or bank of the stream, is subject to a Streambed Alteration Agreement, § 1603 of the Fish & Game Code. Appropriate mitigation and/or reclamation measures need to be identified and agreed on.

Such activities that affect the surface will probably require a Notice or Plan from the appropriate federal land managing agency (BLM or USFS).

We live in the era of reclamation bonds. Deal with it. It's a matter of good faith, and it beats the alternative (no mining!)

Dredge tailings are tolerated because seasonal high flows almost always erase the initial "pocket and pile" profile, and the net effect appears to leave improved spawning gravels. If you operate in a manner that results in long term, adverse impacts: collapsing banks, unnecessarily destroying riparian, significantly altering the flow characteristics of the stream, etc., the regulatory noose will tighten on everyone!

**Where out of the ordinary practices, or surface impacts are necessary**, make sure the value of your deposit merits the costs of reclamation. Have your operation, including mitigation and reclamation measures, approved by the appropriate land managing agency (USFS or BLM) *and* through a § 1603 Agreement with CDFG.



**BUT PLEASE!** Don't leave our industry with a *black eye* for the sake of exploration.

## § 404 PERMITS - The Shape of Things to Come

As this publication goes to press, an August 1994 deadline for § 404 compliance is approaching. Unlike Dept. of Fish & Game permits which pertain to impacts to fish, § 404 of the Clean Water Act reviews a broad spectrum of water issues: water quality, navigability, all other beneficial uses, as well as the biological environment.

Now is the time to look hard at these issues. Those who are not prepared to stay on top of and work with these concerns, may learn - the hard way - why dinosaurs became extinct.

For current information on §404 compliance, contact Miners Alliance, Box 529, Seiad Valley, CA 96086, (916) 496-3166 or your nearest office of the Army Corp of Engineers.

## **FISH HABITAT IMPROVEMENT PROJECTS**

The Trinity River Restoration Program is a cooperative effort established by Congress to restore the anadromous fishery to pre-dam levels. It is composed of local, state, federal and tribal government representatives. Current efforts are focused on stabilizing tributary watersheds to minimize sediment entering the main stem, and constructing and evaluating projects on the main stem of the Trinity that re-contour the river channel to re-create the habitat diversity that has been lost.

**A side channel** is a shallow channel constructed through the gravel bar to enter and exit the main stem, roughly paralleling it. It is constructed to provide shallow, diverse habitat. There are currently eighteen of these projects from Lewiston to the North Fork confluence, averaging 1200 feet long.

**A feather edge** is a site where the riparian growth and the berm which has built up since the dam, are removed and restored to the historic gravel bar contours. There are currently 9 of these projects between Lewiston and the North Fork confluence, averaging 700 feet long.

**Instream structures** on the tributaries usually consist of fixing boulders or logs in strategic points to restore pool/riffle combinations. Tributaries targeted for such projects include the North Fork, Canyon Creek, Hayfork Creek, Big Creek, Bear Creek, Miners Creek and Salt Creek.

Projects cannot be constructed on existing mining claims without the claimant's consent. Make certain that your concerns are addressed at this time. Since most of the bars above the North Fork confluence have been heavily worked, there is rarely a conflict.

Claims newly located over ground that has had one of these projects installed cannot impact or remove these improvements without an approved Plan or Notice from the land managing agency (BLM or USFS). Any mining operation will be required to fully restore the site, as well as to post a financial guarantee.

**Please do not dredge in these side channels.** It is doubtful there could be any significant values, and you will be responsible to fully restore the original contours.

Instream dredging adjacent to a feather edge must not influence the bank. Dredging beyond the wetted perimeter is a violation of CDFG regulations [Title 14 CCR (f)(2)] if done without a §1603 Agreement.

**Protect fish habitat improvement projects.**  
**More fish should mean less regulation for everyone!**

## **BE PART OF THE SOLUTION - SECURE A FUTURE FOR GOLD DREDGING**

There are many positive things we can do to assist the efforts to restore the waters of our state:

- **Removing lead, mercury and submerged garbage is a benefit to our rivers.**

- Photographs of materials you remove from the river corridor are the most effective way to document your efforts. Whenever possible, photograph your collective season efforts: it's usually quite impressive.

- Your mining organization can act as a central collection point for recovered lead from members, and then recycle it as a fundraiser. Again, be sure to photograph your collection, and try to obtain news coverage of your group's positive environmental efforts.

Emphasize to others that the river is a huge rock tumbler, and that submerged lead is constantly exposed to this sandblasting, and oxidation. Keep a sample of black sand concentrate with lead flakes and particles for demonstrations.

- Mercury can be very toxic in small amounts. Most dredgers find small quantities from time to time. Less frequently, dredgers find large pools lost from historic mining operations.

The State Water Resources Control Board recognizes that these incidental clean-ups (of mercury and lead) are of significant benefit to our state's watersheds, and has spearheaded a partnership to encourage and assist dredgers' efforts.

State and federal regulations are very stringent and punitive for storing or transporting more than 10 pounds of mercury. Rick Humphreys, Engineering Geologist for the State Water Resources Control Board will assist you safely through this regulatory maze. He can also connect you with an approved recycler through the California Mining Association.

**Contact Rick Humphreys at: SWRCB, Division of Water Quality, 901 P St., Sacramento, CA 95812-0100. (916)657-0759**

Being able to identify and quantify the amount of clean-up performed by dredgers should become a major priority. We need to get this information to a central point. Let us know what you and others are doing. Contact any of the endorsing organizations listed on the back cover.



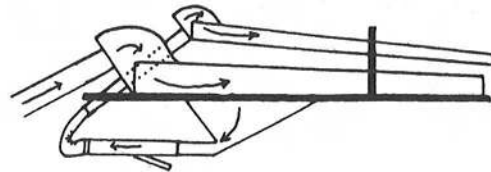


- **Salmon die after spawning.** Check fish carcasses (we are the only one's who routinely see the submerged ones) for tags - a thin loop threaded in front of the dorsal fin. Submit these to the address printed on the loop. A dollar value is usually printed on the tag because when and where the carcass was found is important for CDFG surveys. This could be another great public relations and fund raising opportunity for your mining organization.



- **Organize locally to flag redds.** Educate other users about the importance of not disturbing the redd. Cooperate with your local agencies to identify and protect these areas.

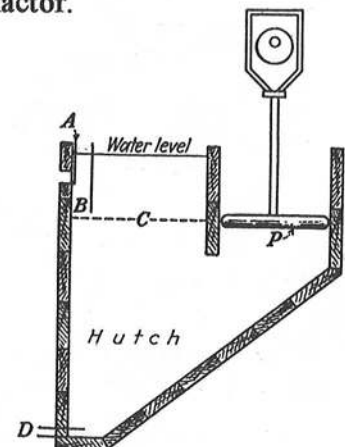
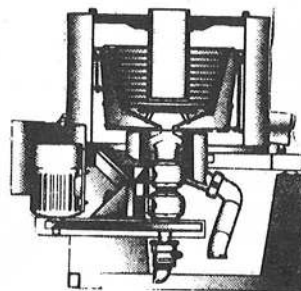
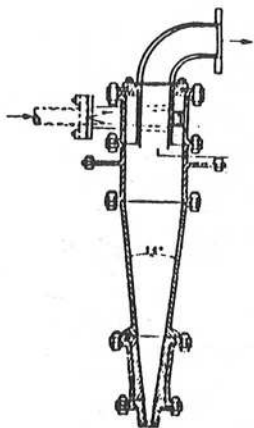
- **Get your mining organization involved in local watershed restoration.** Many local partnership, BioRegion and CRMP (Coordinated Resource Management Plan) groups have organized in response to controversial resource issues. Ecosystem management is the latest watchword. Keep informed. Participate. **The world is run by those who show up!**



## THE NEXT GENERATION

Every miner knows that uniform particle size is the key to fine gold recovery. The laws of physics dictate that the water velocity required to push an 8" rock down a sluice box will carry -40 mesh gold particles right along with it. Because nature is random, we're always catching a hint of that dust in our black sands.

In the quest for fine gold recovery, many individuals have attempted to mate more sophisticated recovery devices to their dredges. "Piggy-back" sluices, though hardly sophisticated, were the earliest expression. To date, prototypes employing various centrifugal bowls, oscillating sluices, rotary sluices, vortex cones and jigs have produced sporadic results. Consistent solid-to-water ratios is a significant factor.



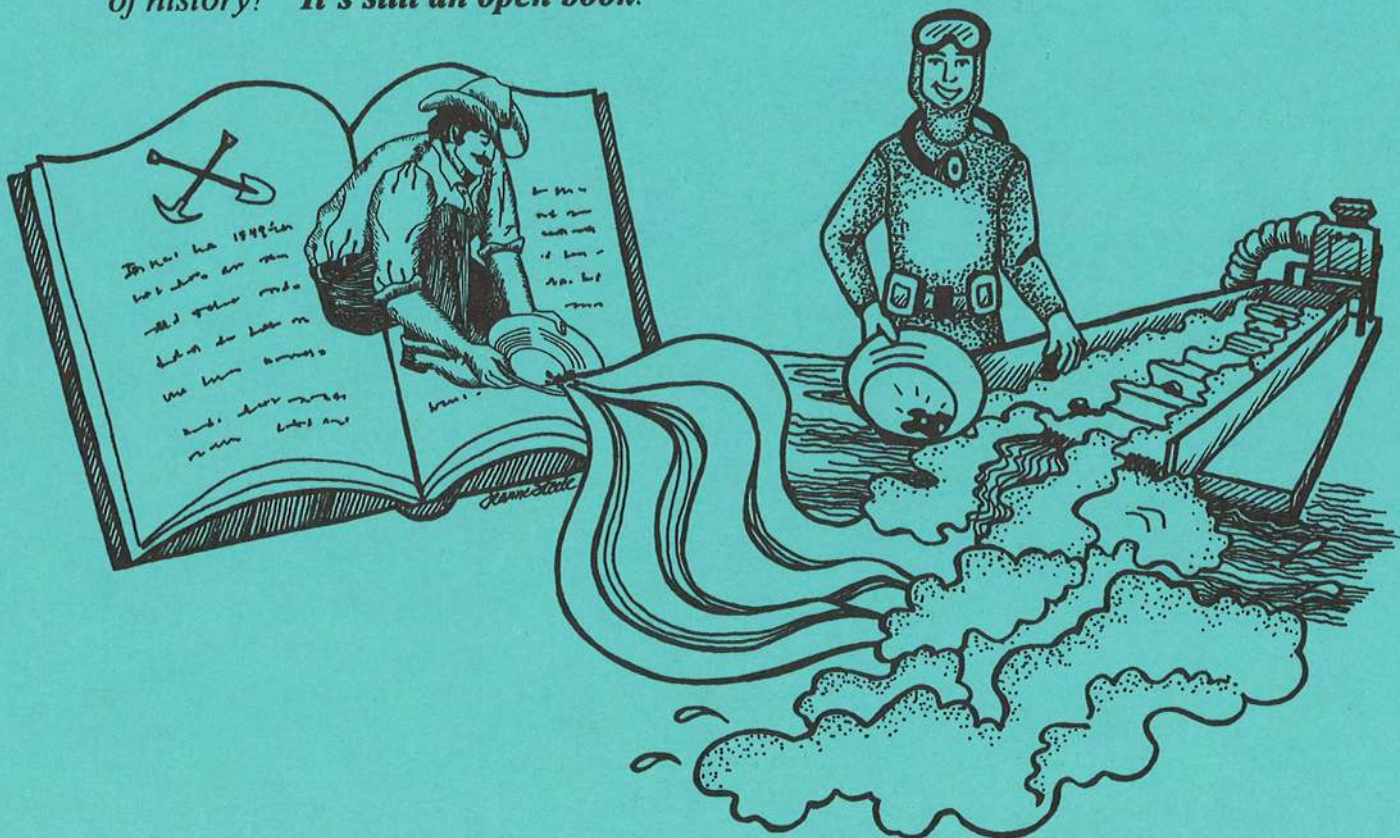


Recent developments indicate a breakthrough is at hand. The success of these systems will be instrumental in the future of dredging. It's possible that the improved recovery, however phenomenal, may be secondary to its value in giving gold dredgers a reprieve from death-by-regulation.

**Extracting the finer sediments from the larger gravel is also a goal for fishery habitat restoration.** While separating the finer gravels for separate processing, it is possible to continuously transport these fine tailings out of the flood plain. Doing so not only improves the gravels for fishery purposes, it eliminates turbidity & sedimentation concerns associated with dredging. Whether accomplished under contract to an agency, or as a side-product of an economically self-supporting endeavor, here is an opportunity for gold dredgers to shape a future for our industry. Regulators and public alike, will view dredgers in a different light.

There are many individuals with a piece to this puzzle, and it's sure to come together soon. If you would like to network, contact this author.

*Will the independent miner enter the 21st century, or vanish into the pages of history? It's still an open book.*





Working for the future for **Independent Miners...**

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