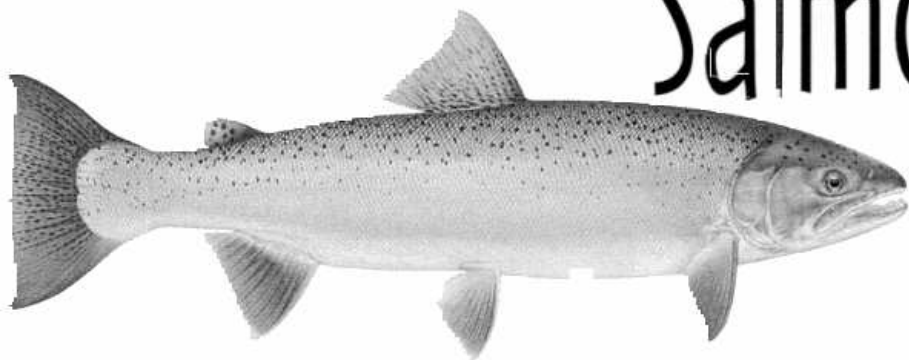


Salmon Power



North Umpqua
summer steelhead

MICHAEL BOWEN
Drawings by Joseph R. Tomelleri

A sea change in perception has spread through the state, generating energy and money for steelhead and salmon recovery. Stream activists, older conservation groups, government agencies, and landowners are working in different ways to restore a balance that includes these totem fish in our living communities.

JUST A FEW MILES from downtown Oakland, in the tidal marsh at the mouth of Alameda Creek, adult steelhead are occasionally seen swimming among dumped shopping carts and other debris, finning gently in the water. A more compelling example of nature's staying power is hard to find.

Somehow they come from the briny ocean, through the Golden Gate, to the eastern shore of San Francisco Bay, and arrive at this urban creek mouth. With sea-lice still clinging to their sides, they wait for autumn storms to raise the creek, allowing for a journey upstream to the spawning gravels of the Sunol Regional Wilderness.

Even in the modern era, the steelhead's timeless life cycle continues to unfold. Eggs hatch in headwater gravels, young spend one to three years in the stream of their birth before migrating out to the rich and dangerous ocean environment. After one to three years the adults return to their natal stream to spawn.

Unhappily, at Alameda Creek, as at many other places, a concrete abutment blocks upstream passage. These powerful creatures can jump over a 10-foot waterfall, but this dam is higher. The engineers who built it, to support tracks for the Bay Area Rapid Transit System (BART), apparently did not expect steelhead here. Like most of the five-plus million people who live in the San Francisco metropolitan area, they would have been amazed and distressed to see them languish and die here.

Fishermen had reported seeing steelhead here for years. In March 1998, a local stewardship group, the Alameda Creek Alliance, verified these reports and members began to document what they saw. Three or four adult steelhead appeared at the base of the dam every winter through 2000. With the help of National Marine Fisheries Service biologists, Alliance members have been lifting them over the barrier, thereby freeing them to spawn naturally in the creek's headwaters. Beyond the dam, Alameda Creek flows for many miles through pastures and parkland, winding gently through oak woodlands and cascading over the boulder-strewn canyons of "Little Yosemite" in Sunol Regional Park.

This is no long-term solution, of course. But the presence of the steelhead was inspiring to the Alliance, which is dedicated to restoring the health of the entire 650-square-mile watershed. Plans are now under way to build fish ladders, remove other barriers upstream, and increase water flow.

These events in a small degraded urban creek are emblematic of the enormous challenge facing those who seek to restore California's anadromous fish runs, both steelhead and salmon. Despite the near hopelessness of their cause, these warriors display a stubborn defiance of the odds.

In the good old days, old-timers say, you could walk across California's rivers on the backs of the salmon, and the sound of thousands of fish returning from the sea, churn-

ing the riffles to foam, was like a freight train coming upriver. Now the once enormous runs have diminished to a pitiful trickle, if they have not vanished entirely.

The causes are well known and well documented: careless, ignorant, and unsustainable land use practices, including mechanized logging and instream gravel mining; heavy livestock grazing without stream bank protection; pro-growth policies without regard for collateral damage; dams and diversions to serve agribusiness and development interests, whose voices and contributions have resonated in Sacramento and Washington far more than all the voices raised in behalf of fish.

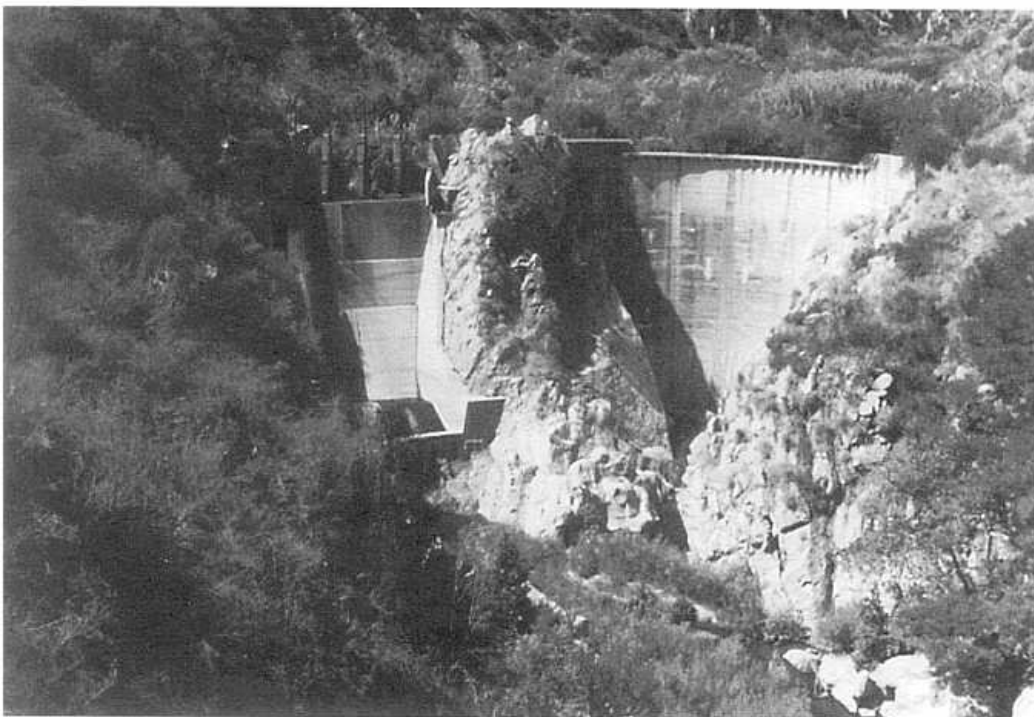
By 1960, every major tributary of the Sacramento River system had been dammed. Some were completely dewatered. The once stately San Joaquin River even flowed backward at times, subject only to irrigation needs. The general public supported this "progress"; few understood or cared what it meant to watersheds and fish. The consequences are summed up by Dennis McEwan, a biologist at the Department of Fish and Game and author of the 1996 California Steelhead Management Plan: "If anadromous stocks are included, California leads the nation in species loss and impairment. Two-thirds of the native fish taxa in California are endangered, threatened, or extinct. Of the 214 Pacific salmonid stocks at risk in the contiguous United States, 39 occur in California. Of

these, 20 were identified as being at high risk of extinction or possibly already extinct."

In the 1970s, a sea change in perception and policy began. Citizens, acknowledging an obviously sad state of affairs, repeatedly approved bond issues and other funding sources in hopes that efforts at fish restoration would not be too little, too late.

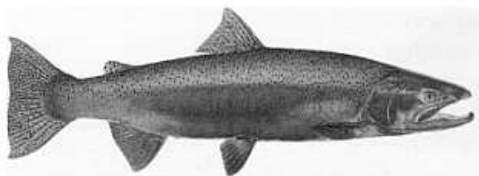
In 1986, Proposition 70 provided \$10 million over 10 years for salmon recovery. This was a meager sum in face of the imminent loss of a priceless public resource, but it was an important beginning. In the 1997 budget negotiating process, salmon and steelhead hit a \$43 million jackpot when Senator Mike Thompson (D-St. Helena) secured the passage of SB-271, which provides long-term dedicated funding to help restore coastal watersheds and their endangered fishes. This measure was recently reauthorized, allowing for the transfer of \$8 million annually from Tidelands Oil Revenues—royalties for oil products extracted from State property—to provide fish recovery funds.

In 2000, Propositions 12 and 13 passed, making available millions of dollars for fish and habitat recovery. Proposition 12, the Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act, allocates working capital for salmon recovery to state agencies, which in turn pass funds along to private conservation groups. The Coastal Conservancy now dis-



Rinde Dam on Malibu Creek is obsolete.

CALIFORNIA TROUT



Red steelhead

tributes \$8.25 million a year in salmon and steelhead recovery funds. Fish and Game will disburse roughly \$23.5 million in fiscal year 2001–2002 through various grant programs.

Nearly every stream with a historic run of salmon or steelhead now has a watershed-based group working to improve habitat, remove obstacles, and change laws and policies in the salmonids' behalf. These groups work with public agencies, private landowners, timber companies, and others. Frequent meetings, conferences, and workshops bring various interest groups together. The growth of observation and planning activity has been exponential.

Are Recovery Funds Being Put to Good Use?

YOU CAN NOW almost cross rivers on the thicket of private and government programs designed to bring the fish back. Yet questions remain: What does all this activity amount to? Are the available public funds being applied in a focused and effective manner toward a common and sensible goal? Or is this money simply generating bureaucratic tangles and paid work for consultants and public officials?

The answer is not obvious. It is obscured by a dizzying array of management procedures, scientific protocols, official policies,

EVER MORE DIVERSIONS

WHILE MILLIONS OF DOLLARS flow into restoring salmon and steelhead habitat, is enough water flowing downstream to support these fish? If a streambed is dry, the large woody debris carefully placed in it will be of no help.

California's gargantuan appetite for water has long been cause for major strife. The state consumes 25 percent of the nation's available fresh water supply, with 80 percent going to agriculture. Much of this water is sold at far below the dollar price it requires to deliver it, to grow subsidized crops.

Further exacerbating the potential for future water wars is anticipated population growth. By 2020, half again as many people are expected to live in California as do now. As urban sprawl extends into dry, rural landscapes, demand for residential water will also grow. Anything that depends on instream flows for survival will face ever greater competition for an already scarce resource.

Who gets water is determined by the State Water Resources Control Board, which can either deny or grant applications for water rights. The traditional rules of western water law, and the Board's implementation of those rules, have contributed greatly to a system that leads to altered and depleted stream flows that are not favorable to fish. Efforts to reform California's arcane water rights process seldom succeed in Sacramento.

By definition, an applicant for water rights or a permit from the Board seeks permission to divert water from instream. Little environmental analysis is required from applicants, and the Board does little to address the cumulative effects of withdrawals on instream flows and aquatic ecosystems.

Lately, the burgeoning wine industry has aggressively sought new water rights permits. Leapfrogging from the Napa Valley to the Alexander Valley to the Anderson Valley, and now to almost every coastal watershed, vineyards are spreading along California's coastline. In addition to deforesting oak woodlands, this new land use pattern is much more water intensive than such previous uses as open pasture or timberland management.

Given that it is always easier to seek forgiveness than permis-

sion, many water rights permit applicants build storage and diversion works prior to Water Board approval, then seek post-construction permits for what is by definition an illegal diversion. According to Stan Griffin, water rights advocate for the conservation group Trout Unlimited, more than 100 such applications for water rights and diversions within the Russian River are pending before the Board. In a July 1998 staff report, the State Water Resources Control Board identified 121 reservoirs without any apparent water rights on the Navarro River, a condition that vastly diminishes important fish flows but that the board has chosen to address through "watershed stewardship programs," which are generally uninvolved in water rights issues. In other words, no corrective action has been taken.

Even while conservationists attempt to work with the State Water Board, the National Marine Fisheries Service, and the Department of Fish and Game to halt the dewatering and over-appropriation of streams through the permitting process, water development in the coastal zone continues. Diversion from headwater streams and tributaries damages habitat essential for the recovery of endangered fish species, including listed salmon and steelhead. The critical question—still unanswered—is, How much water needs to remain in the streams to maintain viable and functioning ecosystems?

Under current water law, water can be claimed only for diversions. California Trout once applied for water to be kept in the stream where it would best protect fish and wildlife. The State Water Board obtusely rejected the application because no plans for a diversion were included. The decision was appealed, but the State Supreme Court upheld the Water Board's decision. In an eloquent dissent, Justice Cruz Reynoso argued that if instream water rights were recognized, then groups like California Trout would be on an equal footing with other appropriators and wouldn't have to jump in and participate with every application process to ensure that enough water was set aside to protect fish and wildlife resources.

—MB

funding requirements, and sheer verbiage. Landowners blessed with remnant runs of salmon grumble that they seem more like a curse because of all the gobbledygook they have to wade through to get anything done. Citizens working on restoration have complained that it takes so long to get permits for projects that time windows close, plans expire, and independent contractors cannot afford to carry on.

"A couple of years ago the high scrutiny on instream restoration efforts delayed and even killed some good projects," says Doug Simmonds, of the Gualala River Watershed Council. "Permit streamlining has allowed that work to proceed," he adds.

Exacerbating the situation is the short staffing at agencies mandated to distribute and use funds. The Department of Fish and Game and other agencies have been overwhelmed by proposals and simply cannot process applications as quickly as grantees expect.

In considering how recovery money is being spent, it helps to remember that we are trapped in the ignorance of our own time. A case in point: In the 1970s many restoration dollars went into removing large woody debris from streams to help salmonids upriver. Now large woody debris is being placed in streams to provide "habitat complexity" and protect juvenile salmonids. Habitat restoration is still in its youth, and we learn as we go.

Today many of the Department of Fish and Game's disbursements go toward closing old logging roads on private timberlands to diminish the flow of eroding sediment into streams. Some critics question the use of public money on private land to repair damage resulting from destructive forest management. Others argue for more diverse approaches to restoration, such as dam removal and landslide stabilization.

More informed policies and practices might grow out of the Citizens Advisory Council established in 1983 by the California Senate to help sort out priorities. Its 11 members include commercial and sports fishermen, fisheries scientists, Native Americans, and members of the public. They bring together a wealth of experience, but only recently has enough funding materialized to implement the recommendations they make.

To assure maximum benefit for salmonids, however, citizens must stay vigilant, participate in the shaping of policy and distribution of public funds, and work toward the



FIELD PHOTOGRAPH LIBRARY

recovery those funds are meant to secure. As they undertake projects and seek funding, they are also pressing for higher standards. In July California Trout—a nonprofit group that works to protect and restore salmonids and their habitats, and to provide quality angling adventures—issued a white paper calling for strict accountability in the area of steelhead recovery, including the establishment of clear baseline information, goals and objectives, and a schedule for accomplishing the lofty goal of species recovery.

Loggers from the old Gualala Mill take a lunch break on a log skid road that had been a salmon stream, circa 1905.

Few Saw What Was Coming

BACK IN THE 1940s, those lucky enough to fish for steelhead had their pick of bucolic settings. Herbert Hoover liked to cast his fly on Woolley Creek, tributary to the mighty Klamath River. Chief justice and former governor of California Earl Warren must have cast his line at the mouth of the Gualala River, for a photograph of him, proudly displaying two sizeable steelhead, hangs in the Gualala Hotel. Far to the south, Ed Henke, before earning 49er football fame, took his share of southern California steelhead from Matilija Creek.

California's unusually diverse landscapes and climates supported scores of runs and varieties of steelhead and salmon. Steelhead, in particular, thrived in wildly different habitats statewide, from the desert washes of the southland to the rugged Smith River near the Oregon border, from the Sierra Nevada peaks to the Golden Gate, and in nearly all coastal watersheds in between. The biological wealth returning home from the sea each year was staggering. Among Ventura County's cobble-bottomed, deep-pooled streams, Matilija Creek alone hosted nearly 5,000 fish in 1943. In Humboldt County, the Eel River's legendary runs approached one million salmon and steelhead.

Anglers stood at fog-shrouded, redwood-lined banks throughout Humboldt and Mendocino Counties in their pursuit of the "silver ghost." The meals, accommodations, and services they purchased generated important revenue for coastal economies increasingly dependent on tourism.

Few saw what was coming. By the 1960s, the good old days were just a memory. Any local businesses dependent upon anglers withered and died. Today, the entire population of southern California steelhead is about 500. The Eel's runs are in the low thousands.

The wholesale collapse of the coho salmon, a species sharing many of the same habitat needs as the steelhead, reflects this alarming trend. The estimated statewide spawning population has fallen from the 1940s number of at least 200,000, perhaps as much as 500,000, to well below 5,000 in 2001. As of early September, the Fish and Game Commission had not yet decided whether this decline warrants species protection under the California Endangered Species Act, and if so, how that decision

will affect regulations for various land use practices.

When the devastation first became apparent, and as the situation continued to deteriorate, public forums were organized to see what could be done. These gatherings often degenerated into blame games in which Indians pointed at fishermen, fishermen returned the favor and blamed seals too, loggers blamed merganser ducks, and environmentalists blamed everyone but themselves. From the riverbank to the state capitol, the blame shifted and rotated. This pattern provided state and federal officials with a convenient way to avoid, at least publicly, the inevitable conclusion that only substantial changes in land use practices would reverse the downward spiral.

Citizen groups continued to organize, however, and attempted to attack the basic causes, especially the inexorable tide of development. They scored a stunning victory in the early 1970s against the Los Angeles Metropolitan Water District juggernaut by defeating the proposed Dos Rios dam, which would have turned the Eel River into a series of flatwater ponds, capturing wild green coastal waters to send south.

Meanwhile, state and federal officials continued to follow their standard recipe for ameliorating habitat destruction. Can't stop the dam or regulate the flows below it? Build a hatchery at its base. Timber harvest too tough to regulate? Give locals hatch boxes to place in streams increasingly choked with sediment washing down from inappropriately constructed roads and landings in timber harvest zones. It was convenient to have blind faith in fish culture, unsupported by quantitative analysis of results.

Salmonid populations continued to collapse, causing citizens to question the original mission of the hatcheries: replacing natural with artificial production at equal or greater levels. Only recently has the hatchery system received significant scientific and financial scrutiny. Hatcheries have been found to be costly and with low productivity relative to healthy river systems. More importantly for the long-term survival of the species, they are incubators for disease, and are likely diluting diverse gene pools and interfering with genetic codes that have allowed fish populations to survive since the last Ice Age despite disease, inhospitable conditions, and even the heavy hand of mankind.



Above: Chief Justice Earl Warren had reason to be pleased. **Right:** Actor Fred MacMurray (right) went fishing with a friend.



What, Then, Is Being Done?

IT IS NOTHING SHORT of miraculous that populations of salmon and steelhead remain, though hanging on by their fins. Californians have acknowledged the severity of the problem, largely dispensed with the unproductive process of fault finding, and provided funds for recovery work. Collaborations between various agencies and citizens groups are increasing and expanding.

At the Department of Fish and Game, new biologists have been hired to conduct environmental analysis at levels necessary to ensure that proposed development projects do not unavoidably disturb salmonid habitat.

At the North Coast Regional Water Quality Control Board, staff has grown from 60 to 135 within the past two years, and a new Regional Watershed Management Division has been created. The Board is now better able to protect and maintain water quality, monitor land use practices, and assist landowners in meeting the complex legal requirements of the Clean Water Act.

Among major problems facing these efforts is extreme short-staffing in the enforcement division of the Fish and Game department. A combination of low pay, staff attrition, and ensuing recruiting difficulties—all of which stem from a lack of support in the capital—have crippled the division. Despite the dangerous nature of their work, which includes everything from arresting armed deer poachers to stopping illegal water diversions from streams, 240 wardens are expected to cover the entire state—with only one-third of them working at any time. They receive roughly half the pay of the average police officer, and 39 percent less than Highway Patrol officers. At a time when highly capable and well-educated candidates are most needed to deal with increasingly complex resource issues, a new warden can expect only \$34,000 per year. That's not very enticing, especially since the first assignment is usually to a major metropolitan area, like Los Angeles, where the cost of living is high.

In considering priorities for public

investments, interesting value questions arise. Should millions of dollars be spent in a southern California stream where fewer than a hundred adult steelhead remain, or should those funds go to the north coast, where those dollars may buy more because fish populations are more robust and the chances for full and rapid recovery are much better? Put another way, is it reasonable to measure success in terms of cost per fish recovered, or should our priorities favor such factors as genetic diversity or species range?

Although these questions remain unanswered, this increased activity and scrutiny has led to unexpected partnerships and coordination between landowners, government agents, and concerned citizens.

Northern California fishery interests joined with some San Joaquin Valley growers recently to oppose a water grab by the Westlands Water District that would have taken Trinity River flows, subsidized their delivery south, and then provided them to Westlands at subsidized

prices to grow subsidized crops on land that is highly contaminated with selenium and other substances.

Far to the north, the little town of Fieldbrook, in Humboldt County,

secured a grant to assess the merits, difficulties, and effects of redesigning local plans and ordinances to conform with geographical watershed boundaries rather than arbitrary political boundaries. Such a bold step would allow local governments and concerned citizens to take charge of their watersheds and manage them holistically.

On the Mendocino coast—scene of frequent battles between large commercial timber operators and local residents—a new spirit of cooperation is visible.

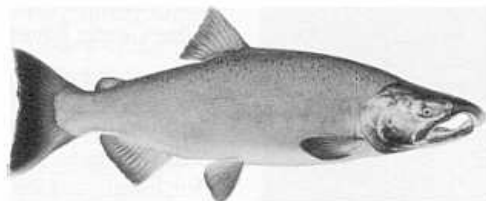
For years land ownership and politics in Mendocino County were closely related and straightforward: Louisiana-Pacific (LP) and Georgia-Pacific (GP) owned most of the commercial timberland, and, well, money talked while other things walked. LP and GP had provided jobs and benefits for as long as people could remember. Of course, cynics claimed that the timber company CEOs were more interested in dividends and quarterly performance than

TOWARD A NEW SALMON ECONOMY

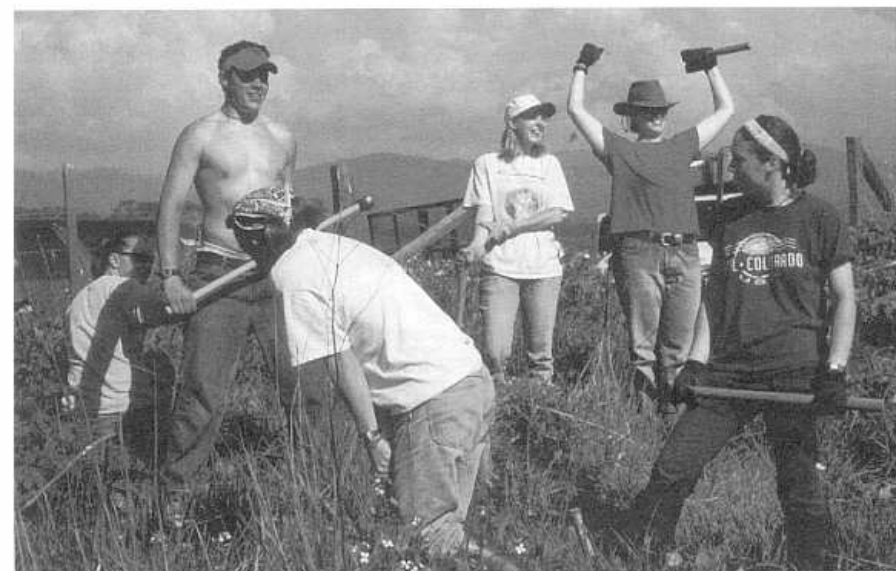
FOR ALL THE TROUBLES they face, salmon still inhabit the soul of the Pacific Northwest. Even though humans play awkward midwives to many salmon—barging them around dams to reach the ocean, or slicing them open to incubate their eggs in plastic cages—the fish leave their imprint on the place where we live. In diminished numbers they still connect ocean denizens and land dwellers in a bond that has been recognized since the days of the first peoples. Just as salmon once brought food for bear, human, and fir tree to the furthest reaches of our watersheds, they tantalize today with a dream of a place in which people can harvest what we need and stand back while the rest of the wild fulfills its own destiny.

That dream of living with the salmon and healing the relations between our species has motivated hundreds of initiatives by citizen groups and entrepreneurs throughout the fish's range. It has spawned watershed councils, fish-rearing projects, and bronze sculptures, and led otherwise sedentary individuals to spend Saturdays pulling brush and planting trees. It has moved some fishermen to handle their fish like gifts instead of cargo, and fish-buyers to value the difference between a factory fish and a wild fish. These broad-based efforts offer the most hope that humans can again show respect for the salmon in the fabric of our way of life, and work out mutually beneficial terms for sharing the North Pacific basin with them. By doing so, we can begin to develop the principles for cooperation with one another and the rest of creation that will allow not only salmon but salamanders and spruce trees to make their way in the world on a fair footing with *Homo sapiens*.

—Seth Zuckerman
from *Salmon Nation: People and Fish at the Edge*, Ecotrust, Portland 1999; www.salmonnation.com



Coho salmon



Top: Years of cattle-grazing denuded the bank of the Garcia River.

Center: A North Coast Ameri-Corps planting crew worked on the riverbank.

Above: Garcia River bank after restoration

in sustainable harvest practices. Like strip miners, when claims played out they would pull out. As harvestable redwood diminished, it began to seem that the cynics might be right.

And so they were: within three years of each other, both LP and GP sold their land base and walked away from what at least one registered professional forester has described as a "boneyard."

Many local residents feared that the stripped timberlands would be sold to

developers, generating a development boom on this rugged and coveted coast. Instead, LP and GP sold to dark horse timber companies, including the Mendocino Redwood Company (MRC) and Hawthorne and Campbell Group. MRC had been formed by Donald Fisher, cofounder of the Gap clothing store chain, expressly for the purpose of acquiring LP's holdings. To say that these new landowners were in a difficult position would be a gross understatement. They had acquired a severely degraded land base with little salable timber, and what there was to sell would have to go to a depressed market. Moreover, the distrust earned by their predecessors has come with the title to the land.

Yet these companies, led chiefly by the MRC, have brought a corporate philosophy to their operations that is different from the one long familiar here, and have defused much ill will by launching some serious recovery efforts. In an article in the May/June issue of *Fly Rod and Reel* magazine, Ted Williams tells how MRC helped Trout Unlimited (TU) improve fish habitat on the Garcia River:

In its first year of existence MRC spent \$3 million moving and stabilizing fish-killing roads, then committed \$4 million for fiscal year 2000. . . . MRC gave Trout Unlimited unlimited access, handing over all maps, all road-maintenance data, all fish records, all temperature records, all sediment-assessment records. I asked [Craig] Bell [TU's restoration coordinator] how that compared to the cooperation he'd received from the previous owner, Louisiana-Pacific. . . . [Bell] said that he had gotten no access to uplands, roads, data, or documents, no encouragement, not even a kind word, just "a stern lecture at the gate to stay in the streams."

[LP's] total cash commitment over ten years amounted to about \$200 for redwood seedlings to be planted by TU volunteers. Roanne Withers, a local activist, and long a thorn in the side of LP and GP, is now helping to bring together MRC, Hawthorne and Campbell Group, the City of Fort Bragg, and others in a Noyo Watershed Alliance. This group will seek to cooperate in efforts to improve water quality and fish habitat within the river system, which provides drinking water for Fort Bragg as well as important refugia for coho salmon.

All this does not mean, of course, that

the timber wars have ended, even in the case of MRC. Enforcement of environmental regulations is generating substantial friction as the new landowners attempt to maximize the profitability of their holdings. For example, MRC is directing much harvesting attention to the Albion River and Greenwood Creek, where genetically pure populations of coho still remain. This has some fish advocates concerned that the last, best habitats are on the chopping block.

Nevertheless, recent events suggest a new approach, one consistent with a growing public desire for forest practices that provide for resource use while rejecting resource abuse. MRC's actions have created a new standard for behavior on the coast that other firms such as Campbell-Hawthorne are feeling the need to meet.

As new watershed stewardship groups continue to form, the Coastal Conservancy serves as a source of seed money and a place where new groups can get their feet wet in the complex field of watershed recovery. The Conservancy has been working for more than 25 years with resource conservation districts (RCDs) and other groups to restore stream habitat in coastal watersheds. In 1990 the Conservancy provided funds to the Mendocino County RCD for an assessment of the Garcia River watershed's health and the development of a watershed enhancement plan. In this plan, one action item stands out in its elegant simplicity.

The lower seven miles of the river, bordered by pasture, had been severely degraded by grazing. The denuded banks provided no cooling effects for young salmonids and regularly sloughed off, muddying the water. The enhancement plan recommended that riparian vegetation, including redwoods, be planted. The RCD's Advisory Group enlisted the support of landowners and dairymen. Local citizens and AmeriCorps volunteers replanted nearly one mile of riverbank between 1995 and 1998 at a total expense of \$5,000. Now mature willows and alders overhang the river, providing shade and a constant source of insect life to hungry and growing young salmon and steelhead below.

This first project has not only led its par-



CALIFORNIA TROUT

ticipants into a brave new world of comprehensive watershed planning, it has allowed the group to complete northern California's first Water Quality Attainment Strategy for a river designated as "impaired" under the Clean Water Act. This approach, which considers a watershed subbasin by subbasin, seeks out the last and best places where salmonids thrive and prioritizes these refugia. This allows restoration to be undertaken in an orderly and focused manner.

The growth of the movement to recover our salmon and steelhead rises out of a change in societal values. Ultimately, the future of these great fish depends on individual and cooperative efforts to diminish human impacts on the landscape—past, present, and future.

The adult steelhead at the BART dam on lower Alameda Creek represent a powerful effort to recolonize lost habitat. Their presence is nothing less than life force in its purest form.

What has happened since they were first noticed is heartening. If current plans are realized, the winter rains of 2004 could bring bright, shiny steelhead blasting up from the Bay unobstructed and ready to perpetuate their species. ■

Michael Bowen works in the North Coast Work Group of the Coastal Conservancy. His fascination with anadromous life forms began at an early age when, while quietly chasing steelhead smolt with a fly, he was chased from the streamside by a rapidly approaching lamprey eel. After collecting his breath, he ran back to watch, and has tried not to avert his eyes since.

Matilija Creek would be prime steelhead habitat if adult fish returning to spawn could get past dams downstream.



**Sacramento River
Chinook salmon**