THE MONTHLY
The East Bay's Premier Magazine of Culture and Commerce

Feature

LOGGING FOR WATER | A battle is brewing over whether cutting down trees will increase California's water supply. | *By Will Parrish*

The day after an unseasonal June rain swelled the streams of the northern Sierra Nevada, Marily Woodhouse steered her 2003 Dodge Dakota through 65 miles of winding mountain roads near Mount Lassen. Woodhouse first traversed the area on horseback shortly after moving here 25 years ago. Back then, the land was lush with life, and its towering conifer forests furnished refreshingly cool air on days that were blistering hot beyond the canopy's shade.

Now, acre after acre of land of the Battle Creek Watershed is parched as far as the eye can see. Nonnative plants like star thistle and mullein compete to cover bare ground that was once studded with pines, firs, and cedars. Rather than finding sanctuary in the forests, Woodhouse now collects data that she says demonstrates the epic damage that has been wrought by the state's largest timber corporation, Sierra Pacific Industries, or SPI.

Nearly every week, for more than seven years, Woodhouse has stopped at the same 13 stream locations in the watershed. At each spot, the founder of the environmental group Battle Creek Alliance uses specialized equipment to examine and record water temperature, water pH, soil temperature, and "turbidity": a measure of individual particles that are generally invisible to the naked eye, similar to smoke in the air.

In 2012, the Ponderosa Fire torched 27,234 acres in the watershed.

Clear-cuts in Battle Creek Watershed, with Mount Lassen in the background, give the area a look like leprosy on the skin. Photo by Zeke Lunder.

But Woodhouse says SPI inflicted much greater harm through post-fire "salvage logging," which involved removing virtually every large- and medium-sized tree in the burned area—both living and dead—and deep-ripping the denuded soil to a depth of three feet with heavy machinery in order to accelerate the growth of newly planted trees.

"I used to think clear-cutting was the worst thing, but it's not," Woodhouse said regarding the salvage logging. "They took everything down to bare dirt. The water quality went crazy bad."

SPI officials have repeatedly defended their logging practices in Battle Creek and elsewhere, and have even argued that they eventually improve the health of forests and streams.

For decades, environmentalists have countered that industrial logging, in fact, damages watersheds because it involves removing vegetation that anchors hillsides and constructing logging roads that cause chronic erosion that chokes streams and rivers with sediment.

However, during the past year, a growing chorus of academics and conservationists has given comfort to the state's logging industry by arguing that California would actually benefit from more logging, especially after years of punishing drought.

At the heart of the debate is the increasing realization that forests throughout the Sierra, Klamath, Siskiyou, and Coast mountain ranges—like the forests that once stood in Battle Creek—are important components of California's water system. Not only do the trees store and filter huge amounts of water, but they also provide shade for the mountain snowpack so that it will melt gradually to fill the state's reservoirs with a steady, year-round supply of water.

And an expanding number of scientists and environmental groups are now arguing that many of California's forests, because of years of fire suppression and other unsound ecological practices, have become overcrowded with trees and that these forests are holding too much water in the soil. Cutting or thinning the trees, they say, will release the groundwater into streams and rivers so that California's dams and reservoirs can capture it.

A leading proponent of this thinking is UC Merced chemical engineering professor Roger Bales, chairman of UC's Sierra Nevada Research Institute. The institute operates 1,300 sensors that measure the geochemical balance of water in the Sierra Nevada's forests, meadows, and streams. "Our groundwater is our largest storage reservoir," Bales noted in a May presentation at Yosemite National Park. Given that 60 percent of the water supply used in California comes

from the Sierra Nevada alone, Bales encourages people to think of the iconic mountain range as "California's water tower."

Another proponent of logging for water is the environmental group the Nature Conservancy, which is helping to bankroll Bales' work. Last year, the group caused a stir in the state's environmental community when it published a report called "Estimating the Water

Marily Woodhouse, founder of Battle Creek Alliance, measures the water quality of the Battle Creek Watershed. Photo by Will Parrish.

Center for Biological Diversity's Justin Augustine doubts upsides for water users. Photo courtesy Justin Augustine.

Supply Benefits from Forest Restoration in the Northern Sierras." The report mainly focused on how thinning national forests impacts the forest's ability to store snow and use water more efficiently.

"The broad point we are making is that the Sierra Nevada and other forested watersheds are the source of most of California's water," said David Edelson, co-author of the report and the Nature Conservancy's Sierra Nevada project director, in an interview. The report concluded that, if the current rate of forest thinning in the Sierra Nevada increases three-fold, there could be up to a 6 percent increase in the average annual streamflow for some watersheds that supply the state's reservoirs.

But many environmentalists reject the idea of cutting down more trees in order to increase water supplies. While some do not oppose thinning forests that are dense with young trees, many agree that the claims of increased water runoff via more logging are greatly exaggerated, and that such an approach could wreak havoc on forests and river systems alike.

"Saying that more logging produces more water is Orwellian 'lies are truth' speak," Woodhouse said.

"It's amazing that this idea has cropped up again," said veteran hydrologist Jonathan Rhodes, referring to logging for water. "I've seen it come and go throughout my career, and it always ends up thoroughly debunked."

Earlier this year, Rhodes and fisheries biologist Christopher Frissell released a comprehensive study that found the Nature Conservancy's report to be deeply flawed. Rhodes and Frissell's study—which was commissioned by the private environmental foundation Environment Now and drew on roughly 230 scientific research citations—concluded that in order to substantially increase the state's water supplies, California would have to do much more than thin forests. "If people really want to take the approach of creating more water runoff through logging, we will be looking at draconian levels of forest removal in this state," Rhodes warned in an interview.

Nonetheless, the logging-for-water idea has recently gained traction in Sacramento and among some other environmental organizations. The conservation group Pacific Forest Trust is currently sponsoring legislation, Assembly Bill 2480, written by Assemblymember Richard Bloom, D-Hollywood, that could increase forest thinning in certain watersheds to release more water for the state's reservoirs.

The state Assembly has approved AB 2480, and it's scheduled for another hearing in the state Senate later this summer. It if passes, it would head to Gov. Jerry Brown's desk.

Many of the state's municipal water agencies oppose the bill, however, because it could require ratepayers—California consumers—to pick up the tab for forest thinning. "Our principal concern is the financing methods," San Diego County Water Authority representative Glen Farrell noted at a June 28 state Senate Natural

Katherine Evatt, an expert on the Mokelumne, has logging concerns. Photo courtesy Katherine Evatt

Resources and Water Committee meeting.

Environment Now director Doug Bevington said in an interview that it's crucial for municipal ratepayers to scrutinize claims being made by logging-for-water proponents. "Bay Area water users are being asked to subsidize damaging logging to the Sierra Nevada and won't see any supply benefits," he said. "They may even have to pay more later on to address the damage to watersheds from all that logging."

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The theory of thinning or clearing forested areas in order to significantly increase water supplies has been around since at least the 1950s, and has always enjoyed timber industry backing, environmentalists say. Bevington, the author of the 2009 book, The Rebirth of Environmentalism, compares the logging-for-water theory to the logic used by deer hunters as they contributed to the extinction of wolves in the American West.

"The claim that cutting more trees would get us more water is similar to the old idea of slaughtering wolves to improve deer hunting, which actually wound up messing up deer populations," he said. "In both notions, a simplistic mindset ignores natural complexity, leading to harmful results."

Over the years, the logging-for-water arguments never gained widespread acceptance, in part because of the deepening recognition of logging's monumental impacts on watersheds.

A case in point is the primary watershed serving the East Bay. The Mokelumne River is the main water source for 1.4 million East Bay residents, including those in Oakland, Berkeley, Richmond, and Alameda. The river's headwaters are in the Stanislaus National Forest in the central Sierra Nevada, and a major reservoir—the Pardee—traps the Mokelumne's water before releasing up to 325 million gallons per day into the 95-mile-long Mokelumne Aqueduct, which conveys it to the East Bay Municipal Utility District's distribution system. Research suggests that 60 percent of the Mokelumne's flow comes from water stored in the Sierra soil, as opposed to snowmelt.

According to Katherine Evatt, one of the state's leading experts on the Mokelumne, historic logging has damaged the watershed through road-building and soil compaction. Logging roads are the main source of soil erosion and landslides in disturbed forests, and they also alter runoff patterns and permanently disrupt subsurface water flows. Further damage comes from the use of heavy logging machinery, the cutting of trees, and then dragging them out of the forest. Burning leftover brush and applying herbicides create even more havoc.

In the late-1990s, Sierra Pacific Industries purchased approximately 78,000 acres in the Mokelumne watershed. And SPI has conducted a considerable amount of clear-cutting in the area, which Evatt said has greatly increased the amount of sedimentation in EBMUD's reservoirs—a cost that is ultimately passed onto utility ratepayers,

because it reduces the reservoirs' storage capacity.

But it's not just the Mokelumne and Battle Creek watersheds that have experienced these impacts. From 1997 to 2014, the California Department of Forestry and Fire Protection approved more than 512,000 acres of clear-cutting in the state, or about 800 square miles: an area approximately as large as Alameda County. And SPI has completed most of these clear-cuts.

From overhead images, such as those from Google Earth, the checkerboard pattern of clear-cuts in watersheds like the Mokelumne gives the land a disturbed appearance reminiscent of leprosy on human skin. Other large timber firms, such as Seattle-based Green Diamond Resources Company, which owns more than 400,000 acres of mainly redwood and Douglas fir forestland in Humboldt, Del Norte, and Trinity counties, also rely heavily on clear-cutting.

"If you walk in a more natural forest, you'll hear birds, insects, see evidence of small mammals, feel moisture in the soil—it looks, feels, sounds, and smells like a forest," said Evatt. She is also president of the environmental group Foothill Conservancy, which is dedicated to protecting the Mokelumne River and its watershed. "But when you walk into a clear-cut or young plantation, it's nearly devoid of life—dry and hot."

The main architect of SPI's success is Archie Aldis "Red" Emmerson, who, according to Forbes magazine, is worth $3.6 billion. Emmerson's son, Mark Emmerson, argued during a 2011 presentation to the UC Berkeley School of Forestry that his company's techniques are helping restore forests over the long run and are essential in the fight against climate change. "In the next 70 years, we will triple the inventory in our forest," he said. "Our tree size will go up from 17 to 30 inches in diameter. We will have pulled 500 million tons of carbon dioxide out of the atmosphere."

But critics say SPI's claims are based on scientific models that are calculated to put a happy face on the company's activities, which they say are permanently degrading the forests through converting them to plantations. Healthy forests are layered, with multiple canopies, small openings where the sun shines through, and darkened hollows where it does not. Different plants and animals thrive in the different habitats.

"SPI is very good at growing trees," said Calaveras County resident Susan Robinson of the conservation group Ebbetts Pass Forest Watch. "But they are also very good at turning forests into something more like cornfields or almond orchards."

SPI is the state's largest private landowner and controls more than 1.8 million acres of forestland. Roughly 80 percent of California's timber production currently comes from logging on private lands, with 20 percent of logs sourced from national forests. Thirty years ago, however, it was the reverse: 80 percent of logging occurred in national forests.

The timber industry has relentlessly lobbied to open up more logging on public lands. According to critics, that is partly because of the pace at which many logging companies are decreasing forest stocks on property they own.

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Currently, there is little disagreement over the fact that national and private forestlands have sustained enormous damage from logging practices and from a century of fire suppression. Numerous forests today are more crowded with trees than ever before. And many of the trees are approximately the same age, an unnatural condition resulting from clear-cutting and other harvesting methods known as "even-aged management."

Some proponents of forest thinning, including UC Merced's Bales, see a synergy between removing trees to guard against fire and extracting more water from mountain runoff. "From a water-resources perspective, there is a sweet spot in between too many and too few trees," Bales wrote to The East Bay Monthly in an email.

The ideal forest pattern, Bales argues, involves creating openings in the forest that are big enough to allow snow to pile deeply, while leaving a sufficient number of large trees to shade the snow and extend the melting season until late summer.

In June, during a presentation to the California Senate Committee on Water and Natural Resources concerning AB 2480, Laurie Wayburn, president of the Pacific Forest Trust, made a similar assertion to that of Bales. She argued that "overly dense, even, closed-canopy forests" had altered runoff patterns in the national forests, and that thinning—followed by the reintroduction of prescribed fires—would be a means of restoring "more water-rich forests."

At the June 28 meeting, committee chairwoman state Sen. Fran Pavley, D-LA, said Wayburn had given a "fantastic presentation" showing that increasing water supply through improved forest management would be a cost-effective measure.

But the Center for Biological Diversity's Justin Augustine contends that such claims are fodder for "a get-rich-quick scheme" that will ultimately benefit timber companies like SPI, rather than watersheds and downstream water users. And Hydrologist Rhodes and fisheries biologist Frissell, who wrote the Environment Now report, say the benefits of logging for water are vastly overstated, and that proponents are omitting its enormous downsides.

"The idea is that if you aggressively cut timber, then you'll have a bigger timber supply, more water, and less fires," Rhodes said in an interview. "Well, only one of those things is true."

Overall, Rhodes and Frissell's report found that "the effects of logging on water flows are often negligible, nonexistent, or negative, and even in the more optimistic scenarios, the potential effects are small, transient, and ill-timed." The report concluded that during drought years, water supply increases from logging would be

minuscule.

In addition, logging produces substantial environmental harms: Rhodes and Frissell identified nine types of damage that result from logging-for-water projects, such as increased water pollution from logging and erosion from logging roads.

These effects can also be expensive to the downstream communities using the water, Frissell and Rhodes wrote. According to their report, numerous scientific studies have also concluded over the years that sustaining increased runoff through tree removal would mean clearing large areas of forest at a high frequency—as much as 25 percent of a watershed area every 10 years. The physical principle involved is straightforward: When forests are thinned, the trees that remain tend to consume whatever water becomes available. As a result, loggers would have to fell large numbers of trees in order to substantially increase water runoff, Rhodes noted, and that runoff would invariably be heavily polluted with sediment because of the amount of logging involved.

Many environmentalists have a mixed view of the ideas touted by the Pacific Forest Trust and the Nature Conservancy, as well as of AB 2480. The bill, for example, calls for reducing the number of rural roads through forests, a move that all involved agree would be beneficial to watersheds. But it also includes language that could pave the way for logging-for-water projects.

Environmental groups' divided positions on the bill are reminiscent of the political battles concerning the 2014 state water bond, Proposition 1, which earmarked hundreds of million of dollars for environmental restoration projects but also furnished $2.7 billion for new water storage projects, a compromise that many fear will lead to the construction of new dams in California.

Izzy Martin, CEO of the Nevada City-based Sierra Fund, supports the ideas on which AB 2480 based. She labels it a great starting point for restoring forests through thinning, though her organization has not taken a position on the bill due to concerns that it may finance ineffective projects.

John Buckley, executive director of the Central Sierra Environmental Resource Center, said he is withholding support from AB 2480 because it focuses only on five watersheds, rather than addressing the totality of California's forests, and also because the bill doesn't address logging practices or other impacts to watersheds. He supports the idea of thinning to enhance watersheds, but said he would rather the bill create incentives for selective logging practices that thin out overly crowded forests, resulting in "lower levels of bare soil, greater protection for watersheds, and significant other ecological benefits."

Martha Davis, who helped lead the campaign to restore Mono Lake in the eastern Sierra in the 1980s and '90s, has promoted stronger links between forest restoration and water supply planning as an adviser to state agencies during the last decade. But while she has not taken a public stance on AB 2480, she said that some of the

ideas about increased water yield through logging are far too one-dimensional. "Some of the studies I've seen so far are treating watersheds like a dam, such that if you just tweak the knob, there could be more water coming out of these systems," said Davis, now the policy director for the Inland Empire Water Agency in Riverside County. "That's not the way it works at all."

Evatt of the Foothill Conservancy has supported a new collaboration by the U.S. Forest Service and the Amador Water Agency to thin forests to reduce wildfire risk, protect water quality, and improve water yield. But she says legislation like AB 2480 is dangerous, because it would fund forest-thinning projects specifically for a single purpose: increasing water yield. "Watershed management and restoration approaches should be more holistic, not focused on a single output or commodity, whether that's timber products, recreation, or more water," she said.

Given what opponents describe as AB 2480's vague language, which promises funding for projects that improve watersheds, some fear that companies like SPI may receive public financing for damaging projects that they claim are beneficial. The Feather River is one of five watersheds that would get special attention under AB 2480. Others are the Trinity, Pit, McCloud, and Sacramento river watersheds.

In total, these watersheds encompass some 7 million acres, about 62 percent of which is publicly owned, mainly by the U.S. Forest Service and Bureau of Land Management. SPI also owns a considerable amount of land in the watersheds, and the company is the largest purchaser of logs from logging on public forests in those areas.

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Battle Creek is a 350-square-mile drainage fed by water from melting snow that drips down the western slope of Mount Lassen. It's also one of the most critical watersheds of the northern Sierra. Because of the creek's ample year-round flow of cold water, state and federal wildlife managers have deemed it the most welcoming area in California for the reintroduction of endangered Sacramento River winter-run Chinook salmon. Baby Chinook must have cold water to survive.

As a result, Battle Creek is the focus of an ongoing $128 million state and federal restoration effort that involves dynamiting hydroelectric dams and constructing fish ladders. The Battle Creek Salmon and Steelhead Restoration Project is one of the most expensive aquatic species restoration programs ever undertaken on the West Coast. Only the removal of two dams on Washington's Elhwa River in 2014 entailed a bigger investment.

But critics say the fisheries agencies' progress in restoring the winter-run Chinook has been persistently undermined by SPI's destructive logging practices upstream. In addition to the salvage logging, the company has clear-cut thousands of acres of Battle Creek's forests in 20-to-40-acre swaths since the 1990s.

The impacts from erosion in the area have been dramatic. Jim Smith, a biologist with the U.S. Fish and Wildlife Service, is one of numerous state and federal agency employees administering the Battle Creek Salmon and Steelhead Restoration Project. "Since the fire, we've seen an extremely high level of sediment input into the watershed," he said. "Some of our deep pools in the south fork, which were some of the best areas for the salmon, just aren't deep anymore."

The question is how much of it has to do with the 2012 Ponderosa Fire versus SPI's logging practices. Smith, as with other state and federal employees, pins most of the blame on the fire. And SPI Research and Monitoring Manager Cajun James asserted in a report that her company's salvage logging actually reduced soil erosion, contending that sites in Battle Creek "disturbed only by fire produced substantially more water runoff and soil erosion than did sites that received post-wildfire salvage logging."

However, most studies of fire-induced erosion show that it dramatically declines a year later, once grasses and forbs grow back. By contrast, the use of heavy equipment in post-fire logging compacts the soil, and the application of post-fire herbicides prevents vegetation from re-establishing itself. Without adequate vegetation to anchor them, hillsides erode into roads, ditches, and culverts for years afterward.

Woodhouse has hired Jack Lewis, a retired statistical hydrologist from the U.S. Forest Service, to analyze the data that she collects on her weekly trips through the watershed. His findings strongly support her claims, pointing to significantly increased erosion in areas impacted by salvage logging and clear-cutting.

Following a 2011 Sacramento Bee investigation of SPI's logging in Battle Creek, the California Natural Resources Agency directed four state agencies, including the California Department of Forestry and Fire Protection, or Cal Fire, to study the impact of clear-cutting on creating sediment-filled runoff, but reported finding "only one instance of low-magnitude sediment delivery (less than 1 cubic yard) directly associated with a clearcut."

Woodhouse said the study's participants failed to find any evidence of logging-induced erosion because they conducted their study at the worst possible time: early fall, before winter rains that would have begun washing sediment into the creek basin. In an email, which was obtained via the California Public Records Act, Cal Fire forester Duane Shintaku later wrote to SPI executive staff members asking permission to conduct further studies, which, he said, "would provide the evidence we need if anyone questions the validity of the Task Force's findings." Despite the friendly nature of this entreaty, the SPI staff turned down the request.

The 1973 California Forest Practice Act was designed to strengthen protections against streamside logging and compel timber companies to harvest selectively. And in a 2009 letter to the Board of Forestry and Fire Protection, a nine-member governor-appointed board that is the policymaking branch of state forestry, Deputy

Attorney General Anita E. Rudd opined that the 1973 law "requires the [b]oard to adopt regulations that include . . . measures for soil erosion control, water quality and watershed control, [and] flood control."

But many environmentalists say this isn't really happening in California, and the main reason is the pro-timber bias of the state Board of Forestry. The board includes three representatives of the timber industry, and over the years, a majority of the board's members have had some association with logging. Currently, two of the seven members of the board have worked for SPI—company forester Richard Wade and Stuart Farber, now of the timber consulting firm Beatty & Associates—while two other members currently or formerly have worked for other timber companies

Under California law, a lumber company must submit a timber harvest plan—a sort of scaled-down version of an environmental impact report—to the state before logging a forest. The so-called "lead agency" for reviewing timber harvest plans is Cal Fire. In an interview, Russ Henly, assistant secretary of Forest Resources Management for the California Natural Resources Agency, said he thinks Cal Fire staffers are "doing a very good job" with their timber harvest plan review responsibilities. "I know they give a hard look to the cumulative impacts of logging as part of the harvesting plans," he said.

But critics contend that Cal Fire is uniquely favorable to the industry it regulates and that it routinely rubber stamps logging companies' plans. The agency's approvals also greatly aid the industry when environmentalists attempt to challenge timber plans through litigation.

"In court, it's not about who gave the better argument, but rather about whether an agency—in this case, Cal Fire—simply has some basis in evidence for their conclusion," said Augustine of the Center for Biological Diversity. Augustine has been involved in several lawsuits against SPI timber harvest plans. "That's a very low bar, unfortunately, that allows agencies to do bad things and still get away with it."

If organizations like the Nature Conservancy are keen on protecting the state's water supply, some say, they should be advocating for reforms of the Board of Forestry and Cal Fire. Instead, the Conservancy has teamed up with the state's main timber-lobbying firm—the California Forestry Association, or CalForests—to promote logging-for-water proposals.

Shortly after the release of the Conservancy's 2015 report, CalForests Chairman David Bischel and the Nature Conservancy's Edelson co-authored an op-ed in the Mercury News, calling for an increase in "the pace and scale of fuels reduction in [national] forests as an important part of the state's water strategy."

The fact that SPI also claims that clear-cutting helps restore forests —and, thus, improves the health of watersheds—worries opponents of logging for water, like Environment Now's Bevington: "SPI's

promotion of clear-cutting is a particularly audacious example of a disturbing trend in which harmful logging projects get repackaged to seem like they are somehow beneficial to forests, when, in fact, they are not."

He says that the Nature Conservancy's collaboration with CalForests is roughly akin to collaborating with SPI itself. SPI CEO Mark Emmerson is the board chairman of CalForests. And according to CalForests' financial statements, SPI gave $71,500 to the organization from 2011 to 2015, more than any other company.

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Given that avenues for increased forest protection are largely blocked at the state level, environmental activists have sought other options to build momentum for change, including an effort to create a groundswell for reform in cities and counties. In 2015, the city of Berkeley became one of seven California cities to call on the state Legislature to enact a ban on clear-cutting, joining San Francisco, Daly City, Davis, Menlo Park, Monte Sereno, and Brisbane. The resolution cited Berkeley's desire to protect its water supply from sedimentation and pollution caused by SPI.

"We've talked to lots of legislators," said Sierra Club volunteer Karen Maki, who is an organizer of the campaign for a statewide clear-cutting ban and a resident of Los Gatos. "They're sympathetic, but they aren't doing much yet. We figured if we got a lot of cities to pass the resolutions, it would start to have some influence."

Maki acknowledges that a ban on clear-cutting is not a cure-all. But it is an important step, she said, in terms of protecting California's water supply and quality alike, and one that most environmentalists should be able to rally around. In 1990, a ballot initiative called Forests Forever that would have banned clear-cutting throughout the state lost by only three percentage points.

Menlo Park City Councilmember Catherine Carlton presented her city's resolution calling for a clear-cutting ban to the League of California Cities annual convention in 2014, and she said she received a strongly favorable response from other city councilmembers and mayors. "It's an idea that makes sense, so I'm sure it will keep coming up," she said.

The municipal resolutions call attention to another aspect of forest degradation: climate change. The Berkeley version asserts that the timber industry accounts for roughly 10 percent of the state's greenhouse gas emissions.

According to scientific predictions, global warming is causing more variability in California's climate, with more intense storms, longer dry periods, and less snowpack, with more precipitation falling as rain instead of snow.

Hydrologist Rhodes says the renewal of logging-for-water claims is particularly frustrating given that there are lower-cost ways of restoring these watersheds on public lands that don't involve logging. Three of these methods include the reduction or cessation

of livestock grazing near streams and meadows in headwaters, reductions in the extensive network of logging roads in national forests, and the restoration of beaver populations, which helps to slow water on its course downstream so that it trickles into the ground.

But Bevington said it's not surprising that the logging-for-water claim has gained renewed attention in California during the recent intense drought.

"In desperate times, people are more susceptible to believing promises of easy water, rather than looking closely at the problems with those claims," he continued. "But if EBMUD or other utilities end up subsidizing logging in the Sierra Nevada and other mountain ranges, Bay Area residents are likely to see no significant benefits in terms of water flows."

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