



Stanford University's Dirty Secret: Searsville Dam

By Matt Stoecker

— Beyond Searsville Dam —

Matt Stoecker grew up next to Corte Madera Creek, upstream of Searsville Dam, and is director of the non-profit coalition Beyond Searsville Dam. To find out more and join the coalition visit their website at: BeyondSearsvilleDam.org

Behind the locked gates and tall, barbed wire fencing of Stanford University's Jasper Ridge Biological Preserve hides the institution's dirtiest and most misunderstood secret: Searsville Dam. For 120 years this antiquated dam and artificial reservoir have devastated the San Francisquito Creek watershed and San Francisco Bay ecosystems.

The obsolete dam

Built between 1888 and 1892 by the Spring Valley Water Company, the 65-foot tall concrete block dam was intended to divert the captured waters of Corte Madera Creek through a pipeline to the Crystal Springs Reservoir, being built to the north, and supply drinking water to the San Francisco Peninsula. When the stagnant reservoir filled up, the unpleasant smelling water derailed the original purpose and the pipeline was never built. Searsville Dam never served its intended purpose as a potable water source and was taken over by Stanford in the early 1900s. Today, the reservoir is over 90% filled in with almost 1.5 million cubic yards of trapped sediment and may fill in completely in one or several years, depending on flows and erosion upstream that awaits input from winter rains, landslides, potential fires, and movement on the San Andreas Fault. One thing that most people agree on is that if nothing is done, the remnant reservoir will completely fill in with sediment in the very near future. This is not an acceptable

option for most parties involved and for a variety of safety, biological, and operational standpoints. The dam provides no flood control function, produces no hydro power, produces no drinking water, and supplies a small amount of Stanford's total "lake" irrigation water supply. Stanford diverts water from three San Francisquito Creek watershed locations and into this lake system to feed the thirsty golf course, playing fields, and landscaping. Searsville Dam is one of the diversions. The relatively small amount of

ed watershed, but none have returned for the last half-century. The once sizable, and still persistent, annual adult steelhead run has been well documented for over a century, with consistent observations to the present. In the 1990s, I watched in amazement as 30-inch steelhead launched against the face of the concrete dam only to fall back in defeat.

The impassable Searsville Dam has been identified as the most limiting factor to the persistence and recovery of steelhead in the San Francisquito Creek; one of the last, sizable, wild populations left in streams of the San Francisco Bay. The Center for Ecosystem Management and Restoration identified the watershed as a key "anchor watershed" for wild steelhead recovery in the San Francisco Bay. Interestingly, politics played a role in preserving the creek. The lower mainstem of San Francisquito Creek was designated the boundary between San Mateo and Santa Clara counties long ago. Fortunately, the two counties couldn't agree upon how to put the creek in a concrete channel, like other Bay streams, or on who would pay for it. The result is that the creek is one of the few urban streams left that drains into the Bay without concrete channels and in a relatively natural state. The headwater streams of the watershed drain extensively protected open space lands along the spine of the Santa Cruz Mountains above the towns of Woodside and Portola Valley. For these reasons, steelhead continue to hold on below Searsville Dam and in the other two tributaries downstream.

Native rainbow trout, the descendants of sea-run steelhead, also persist in Corte Madera Creek and tributaries upstream of the dam. These upstream trout are also at risk of extinction due to the upstream migration barrier of

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Searsville water could be captured with a damless diversion and stored in expanded and existing off-stream reservoirs.

Salmon and steelhead be dammed

Stanford Historical Society book "The History of Jasper Ridge" recalls that after construction of Searsville Dam, the dam caretaker harvested salmon at the base of the dam where they were blocked. "When the dam was "wasting" (i.e. overflowing) in the winter, salmon would swim upstream as far as the dam. Using a pitchfork, the caretaker could spear them to supplement the family's diet". Additional oral, written, and archeological lines of evidence support the historic presence of coho salmon in the redwood-forest-

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Searsville Dam, which has fragmented and genetically isolated the population, causing inbreeding and susceptibility to climate change impacts. The ecological significance of the loss of steelhead and salmon to the upper watershed cannot be overstated. Historic annual runs of these amazing fish transported tons of ocean-derived nutrients back to the Bay, up San Francisquito Creek, and throughout the many headwater streams to the benefit of dozens of other species of animals and even creekside vegetation and the redwood forest. Juvenile steelhead and salmon migrating from San Francisquito Creek to the sea, as well as outmigrating adult steelhead, also fed marine fishes, birds, seals, dolphins and even orca whales thousands of miles away. Like so many others, Searsville Dam has severed that critical flow of nutrients between our continental and oceanic ecosystems.

Over a century of damage continues

The dam and reservoir buried and submerged a unique valley where over six streams flowing from all directions came together among natural wetlands before squeezing through a small gorge where the dam was built. This intersection of riparian forests, streams, and natural ponds was a critical wildlife corridor for aquatic and terrestrial species and a unique wetland habitat. The dam's concrete wall and artificial swamp submerged this natural wetland ecosystem and is now filling it with sediment that is so desperately needed for wetland survival and restoration efforts downstream in the San Francisco Bay.

The warmwater habitat of the rapidly disappearing reservoir supports non-native and predatory fish, bullfrogs and crawfish. These predators disperse downstream to compete with and prey upon endangered and native steelhead, red-legged frogs, San Francisco garter snakes, juvenile western pond turtles, and other aquatic and terrestrial species. Stanford's own Philippe Cohen and David Freyberg report that Searsville Reservoir is the "primary source" of non-native fish in the watershed and that non-native "fish species, both



Steve Rothert, with American Rivers, ponders the future of Searsville Dam as the lack of bypass flows dewater and degrade the creek below. Photo by Matt Stoecker

crawfish, and bullfrogs are known to be detrimental to steelhead and red-legged frogs." Surprisingly Stanford's recently proposed Habitat Conservation Plan (HCP) states that the Jasper Ridge Biological Preserve "is not operated as a refuge for native plants and animals" and the HCP includes no proposal to rectify this destructive condition. This situation makes one wonder exactly what is being "preserved" at Jasper Ridge and if the Preserve's stated mission is consistent with Stanford's stated goals of protecting endangered species and native habitat. There are evidently multiple issues of consistency.

The draft HCP also states that "about 3 to 5 miles of suitable spawning habitat" for steelhead occurs upstream of Searsville Dam. Our analysis identified almost 2.5 miles of steelhead habitat buried and submerged by the reservoir and trapped sediment alone. National Marine Fisheries Service (NMFS) recently completed a separate analysis and estimated that 20 or more miles of upstream steelhead habitat may be blocked by the dam. This is just one of the dozens of significant inaccuracies we identified in

Stanford's plan and included in Beyond Searsville Dam's public comment letters for the draft HCP and draft Environmental Impact Statement (DEIS).

The administrative director at Jasper Ridge, Philippe Cohen, often describes the artificial reservoir as somehow being integrated into the environment, after more than a century, and valuable as wetland habitat that supports high densities of birds and bats. This portrayal fails to recognize that the artificial reservoir destroyed extensive natural wetland habitat that native species evolved with, and Searsville operations continue to degrade the environment far beyond the No Trespassing signs surrounding Jasper Ridge. The U.S. Geological Survey (USGS) recently reported that "major causes of wetlands loss and degradation" include "damming, changing nutrient levels, introducing non-native species to the ecosystem." Searsville scores three for three there. A Heinz Center report, "Dam Removal: Science and Decision Making," states that "more than half of all the animals and plants on the endangered species

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list owed their precarious positions to water control structures” such as dams.

A vision for the future?

The dam’s supporters often speculate that removing the dam and reservoir may have an overall negative impact to the Jasper Ridge ecosystem despite no studies to support this notion and evidence to the contrary. A recent study and report by the National Oceanic and Atmospheric Administration (NOAA) and the University of Idaho found that this year’s removal of two large dams, and their artificial reservoir habitats, from the Elwha River in Washington would benefit native birds, fish, frogs, salamanders, and other species. “On the whole, the negative wildlife impacts caused by the dam removal will be negated by the positive effects on the wildlife of the Elwha.” In addition to the above, Searsville Dam removal could be accomplished while stabilizing much of the riparian forest habitat that has grown up on the edge of the reservoir sediments and retaining significant open water habitat at historic wetland ponds and enhanced natural flood protection features.

As the summer sun heats up the exposed Searsville Reservoir, the aquatic conditions degrade as algae bloom, dissolved oxygen levels drop, and water temperatures and turbidity increase. The combined impacts of water evaporation from the reservoir, water diversions, and no downstream bypass flow agreement at the dam causes the downstream creek to dry up for a longer period in the summer and fall and water quality to decline. These degraded habitat conditions extend downstream of the dam the full length of San Francisquito Creek to the Bay. The fact that a leading institution preaching “water sustainability” and endangered species protection has no operational bypass flows at a dam, regularly dewater listed Critical Habitat for steelhead and other federally listed species, and that the resource agencies are letting them do it, is a sad report card on the current state of Stanford education, leadership and public agency protection of our imperiled natural heritage. The antiquated dam



A late 1800’s survey map that shows the proposed Searsville Dam site (upper right) and the unique confluence of meandering streams, wetlands, and small gorge now buried by the dam and reservoir. A vision for the future?

and its 19th century operations appear to be in violation of over a dozen state and federal laws.

A flawed Habitat Conservation Plan...again!

Amazingly, Stanford’s current HCP proposal to NMFS and the U.S. Fish and Wildlife Service (USFWS) for their over 8000 acre campus has requested that Searsville Dam and its activities be excluded from the HCP. This is a blatant acknowledgement that the dam

and operations are so far out of environmental compliance that the HCP would never be permitted with them in it. For at least four of the species they seek coverage for in the HCP (steelhead, red-legged frog, San Francisco garter snake, and western pond turtle), Searsville Dam and its operations are one of, if not the, most limiting factor to their persistence and recovery on Stanford lands and beyond. On May 1, 2011, along with our partner American Rivers, Beyond Searsville Dam has

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submitted a letter to NMFS and USFWS stating that Stanford cannot legally separate Searsville Dam and its diversion activities from the lake water diversion system for which they seek coverage and of which Searsville activities are an integral component. If Stanford is unwilling to address the many state and federal non-compliance issues related to Searsville in this HCP, then the federal agencies must ensure that they cannot obtain coverage for their intergraded and improperly operated lake water system either. Stanford's own documents state that Searsville is an integral part of the lake water system.

Damming the Bay

Recent studies are showing that trapping sediment behind dams is also putting coastal wetlands at risk of collapse due to climate-change-induced sea level rise. The State of Delaware and University of Maryland recently reported that, "diminished river sediment is a significant problem, and when coupled with continued sea level rise, the Delaware and Chesapeake Bay estuaries may see the potential collapse of hundreds of thousands of hectares of coastal marsh in the coming decades." Along the Texas coast USGS found that "...upstream reservoirs have reduced wetland sedimentation rates, which are now about one-half the local rates of relative sea-level rise" and that coastal wetlands "will continue to be lost as a result of submergence and erosion." On the Gulf coast, another team of USGS scientists found that, "There are many causes of wetland loss, but chief among them are the dams, levees, navigation projects and channels erected along the mainstem and major tributaries of the Mississippi River. They have resulted in a 67 percent decrease in sediment delivered to the Louisiana coast, a necessary process to keep marshlands replenished." And right here in the San Francisco Bay, near the mouth of San Francisquito Creek, teams from USGS are finding that there may not be enough suspended sediment from rivers and streams draining into the Bay to prevent coastal wetland collapse in the face of sea level rise, let

alone meet the objectives of one of the nation's largest restoration efforts to convert thousands of acres of former salt evaporation ponds back to natural wetlands. Billions of restoration dollars are at risk of disappearing underwater. One of the only cited long-term solutions to restoring sediment transport to coastal wetlands so they can survive projected sea level rise is the removal of dams that are trapping this critical building block.

Hypocrisy at the highest level

The disconnect between what Stanford faculty is teaching about ecological preservation, water conservation, and climate change, and how the university is addressing Searsville Dam, an embarrassing HCP proposal, operations of their own water supply, and their stewardship of the San Francisquito Creek watershed and SF Bay region begs the question: 'Who's at the helm of this ship and are they listening to what their own scientists and experts are teaching and promoting elsewhere?' While many scientists and leaders at Stanford are teaching and doing exactly the right things, there are others involved with Searsville and the HCP process that are promoting inaccurate information that is disconnected from accepted scientific fact, environmental laws, and informed decision making. The single biggest challenge for the leadership at Stanford in addressing the complex Searsville Dam situation may very well be the ability to distinguish between the bright minds available to lead on this issue and the misguided ones that continue to hold it back.

Opportunity amid the muck

Beyond Searsville Dam is a non-profit coalition of over three dozen groups and businesses and over 3000 members and supporters that share a common interest in supporting actions to



The LEED certified "green" field station at Jasper Ridge next to the destructive, non-compliant, Searsville Dam and disappearing reservoir. Photo courtesy Beyond Searsville Dam

evaluate and consider removing Searsville Dam in a manner that is beneficial to protecting creekside communities, watershed health, and the San Francisco Bay.

For over a decade, stakeholders have been trying to collaborate with Stanford on studying dam removal as an option to consider for Searsville. An offer by the Department of Water Resources to conduct a dam removal feasibility study for free was turned down. Stanford has resisted involvement from stakeholders and flood protection agencies downstream who are significantly impacted by any decision at the dam. To this day, a dam removal feasibility study has never been conducted. The science is clear that restoring free-flowing streams by removing antiquated dams is not only feasible, but is accelerating at a rapid pace and provides enormous environmental, economic, and social benefits. The Aspen Institute report, *Dam Removal: A New Option for a New Century*, states: "Dam removal may result in environmental improvements by restoring natural flows to a river, removing blockages to fish movement, reestablishing healthy river habitat for fish and wildlife and improving water quality. Dam removal may provide social benefits by eliminating safety hazards... and economic benefits by avoiding costs associated with dam safety improvements and environmental impact mitigation." According to

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American Rivers, more than 600 dams in the U.S. have been removed over the past 50 years. Owners of antiquated dams are lining up to take advantage of the funding and regulatory benefits afforded with dam removal projects.

Stanford University has an amazing opportunity to work collaboratively with the surrounding communities to show leadership in community planning, land stewardship, sustainable water use, and the science of watershed-scale ecosystem restoration at a revived Jasper Ridge Biological Preserve. With over a century of scientific investigations at Jasper Ridge, surrounding Searsville Dam and Reservoir, the potential to remove the dam and study the restoration is a research opportunity of international significance and would establish Stanford as a leader in environmentally beneficial science and responsible land and water stewardship. Alternatively, if the university continues sailing on the same misguided course, there appears to be an iceberg ahead.

Take action!

Demand that our federal agencies not consider finalizing their draft EIS for Stanford's flawed Habitat Conservation Plan, that Stanford acknowledge and adequately address Searsville Dam as an integral part of their "lake" Water system in their HCP, and that a revised and corrected HCP and supplemental draft EIS be released to the public for review and comment. Thanks.

Please send an email to:

Gary Stern, National Marine Fisheries Service: gary.stern@noaa.gov

Sheila Larson, U.S. Fish and Wildlife Service: Sheila_Larsen@fws.gov

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Please copy Beyond Searsville Dam at: info@BeyondSearsvilleDam.org



A 31-inch San Francisquito Creek steelhead is rescued from a drying reach below a diversion dam and transferred to a deep pool. Photo by Matt Stoecker

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