

POINT / COUNTERPOINT: Hetch Hetchy Valley Restoration

In 1923, the completion of the O'Shaughnessy Dam on the Tuolumne River in California flooded Hetch Hetchy Valley in Yosemite National Park, creating a reservoir for San Francisco's drinking water and a hydroelectric power supply. Now, the system requires expensive upgrades, and many feel it is time instead to remove the dam and restore the valley, considered by many to rival Yosemite's beauty, and find alternate power and water supplies to meet the growing demand. In November, the California Department of Water Resources and the Department of Parks and Recreation agreed to review existing data and write an assessment within a year. Compelling arguments can be made both for and against the dam removal, as presented in these articles.

POINT: Restore a National Treasure

Spreck Rosekrans, Senior Analyst – Environmental Defense

Hetch Hetchy Valley, carved by glaciers descending the Tuolumne River, was described by naturalist John Muir as a "grand landscape garden" and "Yosemite's wonderfully exact counterpart." Congress preserved Hetch Hetchy in 1890 as part of Yosemite National Park. Just two decades later, however, despite a nationwide outcry, Congress allowed the valley to be dammed to supply water to San Francisco and other Bay Area cities.

As San Francisco undertakes a major program to repair and expand its water system, Environmental Defense decided to consider how the system could provide reliable water and power without a reservoir in Yosemite National Park. We developed a planning model, TREWSSIM (Tuolumne River Equivalent Water Supply Simulation), which incorporates features of both San Francisco's own planning model and the state-federal CALSIM model. We also retained three distinguished consulting firms to assist with engineering, water quality, and legal issues. Our report, "Paradise Regained: Solutions for Restoring Yosemite's Hetch Hetchy Valley," presents a planning-level analysis of how to replace the benefits provided by the current reservoir.

Water Supply

Hetch Hetchy Reservoir holds 360,000 acre-feet of water, 23 percent of San Francisco's system total and less than 13 percent of the total in the storage-rich Tuolumne watershed. Under the current system configuration, 85 percent of the water delivered to San Francisco and other Bay Area customers is diverted from Hetch Hetchy Reservoir. Under our proposal, the SFPUC would construct diversion facilities from other system reservoirs to replace the diversions from storage that are currently made during summer and fall months when the river's natural flow is insufficient. TREWSSIM results show that 96 percent of the total supply could be delivered without using Hetch Hetchy Reservoir while preserving significant carryover storage, in case future droughts due to global warming or other causes, are worse than those that occurred in the 20th century.

Even if demand increases significantly, additional supply would only be needed in the driest of five years. The San Francisco Public Utilities Commission (SFPUC) could meet dry-year needs with the same strategies that other California water agencies have recently employed: increased local (offstream) storage, groundwater exchange programs, or dry-year purchases from irrigation districts.

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COUNTERPOINT: Hetch Hetchy Reservoir Is a Vital Part of Bay Area, California Water System

Michael Carlin – San Francisco Public Utilities Commission Director of Planning

The Hetch Hetchy Reservoir in Yosemite National Park stores Tuolumne River water and is the primary source of drinking water for more than 2.4 million people in San Francisco, San Mateo, Santa Clara, and Alameda counties in California. Hetch Hetchy is part of a larger water system that provides irrigation water to the Modesto and Turlock irrigation districts and an average 1,700 gigawatt hours of clean power to Central Valley farmers and cities as well as to the city and county of San Francisco, or about 20 percent of San Francisco's overall power consumption. The San Francisco Public Utilities Commission (SFPUC) is California's third largest municipal water agency, after Metropolitan Water District of Southern California and the San Diego County Water Agency.

Current proposals to remove O'Shaughnessy Dam do not take into account the larger context of water in California or those issues associated with draining Hetch Hetchy Reservoir. While the SFPUC appreciates the intentions of individuals and groups seeking the restoration of Hetch Hetchy Valley, we maintain that it is not effective to analyze the Hetch Hetchy system without considering the bigger picture. The Hetch Hetchy system is a critical piece in a larger and complex water and energy system including the western states, California as a whole, and the San Francisco Bay Area. We must acknowledge that changes we make with water and power affect us all, whether those changes impact access to potable, industrial, or irrigation water supplies, the quality of that water as it affects our health and safety, or the monetary and quality-of-life costs that accompany changes to the system.

As national studies show, dam removal can provide environmental, economic, and social benefits in some cases. But many dams are too economically and socially valuable to be considered for removal. Any removal proposal should consider the "ripple" effects. The following primary questions and issues are not adequately addressed by proposals to drain Hetch Hetchy Reservoir:

1. Eighty-five percent of the water served to San Francisco's 2.4 million customers flows through the Hetch Hetchy Reservoir.

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Water Quality

SFPUC's diversions from the upper Tuolumne River have a rare filtration avoidance granted by the U.S. Environmental Protection Agency and the California Department of Health Services. Under our plan, some of these supplies would be diverted lower in the watershed and the entire supply would be filtered. Preliminary analysis by our consultants, Eisenberg, Olivieri and Associates (EOA), indicates that filtration would reduce certain constituents of concern, including *Cryptosporidium* and *Giardia*. EOA also found that "there does not appear to be any technical reason that the SFPUC Hetch Hetchy water supply system could not be operated without the Hetch Hetchy Reservoir" and made recommendations for further analyses that should be pursued as part of a final plan.

Hydropower

Restoring Hetch Hetchy Valley would reduce generation from two of the SFPUC's three Tuolumne River powerhouses. TREWSSIM modeling estimates an average annual reduction of between 339 and 690 million kilowatt-hours per year (20 to 40 percent of average annual generation), depending on whether the uppermost power tunnel would be modified to accommodate run-of-river diversions within Yosemite National Park.

Several options are available to replace—or eliminate the need for—the lost energy. Demand-side measures, such as increased investments in energy efficiency and expansion of dynamic pricing programs, offer cost-effective means of displacing both the energy and capacity needs currently met by the SFPUC's hydropower facilities. Renewable energy, especially solar and wind power, are the greenest new supply-side resources. New highly efficient gas-fired plants are the best available fossil-fueled alternative. We address not only the state-of-the-art pollution controls that are required for new gas-powered power plants but also how to offset all emissions of concern, including greenhouse gases, by finding ways to cut an equivalent amount of pollution from other sources.

Costs of replacing water and power

The total estimated cost (capital costs plus present value of operating costs) of replacing the water and power services provided by O'Shaughnessy Dam ranges from \$500 million to \$1.65 billion. Key factors affecting the range include decisions about hydropower and filtration, as well as a standard range of uncertainty for engineering costs.

We understand that additional studies are needed and must take place in a public forum that addresses the concerns of all communities that rely on the Tuolumne River for water and hydropower. We are pleased that the Schwarzenegger administration has committed to review "Paradise Regained" and other studies, and also will undertake analysis of the benefits that a restored valley would provide to the American people.

We encourage people to read our report, and to decide for

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Removing 360,000 acre-feet of storage from California's water system would greatly impact the water supply for Bay Area customers and Central Valley farmers.

2. In California, the politics of water have too often been a "zero sum" game: one person or region's gain comes at a price to another. Proponents of draining Hetch Hetchy suggest that the Tuolumne River system is somehow exempt from this equation. In fact, California needs millions of acre-feet of new storage elsewhere to meet water supply needs for people, food, and fish.

3. Water from Hetch Hetchy is of the highest quality and comes unfiltered from the reservoir. Replacing this high-quality source would require the construction of filtration plants, costing more than a billion dollars without the associated conveyance appurtenances.

4. The CALFED Bay-Delta Program states in its 2004 multiyear plan that the state and federal water systems alone (not counting local systems) are in need of developing between 1.2 and 1.5 million acre-feet of additional water storage. Federal, state, and local governments are spending millions to complete feasibility studies for four new storage projects. Removing storage that communities depend upon is wholly inconsistent with the direction that this state must take.

5. CALFED's ten year plan, without storage and conveyance, will require in excess of \$7.6 billion dollars. With storage and conveyance, it could be as high as \$15.7 billion. What would be the source of the additional billions necessary to drain Hetch Hetchy Reservoir and attempt to make the Bay Area whole again?

Leaders in the Bay Area and the SFPUC are sympathetic

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O'Shaughnessy Dam in Hetch Hetchy Valley.