

Shasta Dam Raise and Reservoir Enlargement

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The U.S. Bureau of Reclamation is studying the feasibility of raising Shasta Dam and enlarging its reservoir. Completed in 1945 on the Sacramento River, the dam is already the highest in California and its 4.5 million acre-foot reservoir is the largest (by volume) in the state. Key issues concerning the dam raise include:

- Raising Shasta Dam and enlarging its reservoir could significantly affect the human and natural environment, including Native American tribal lands and resources, as well as recreational sites and businesses surrounding the existing reservoir.
- The dam raise and reservoir expansion would impact scenic and recreational values, river segments upstream and downstream of the reservoir and dam, as well as rare, threatened and endangered species and their habitat.
- The dam raise would cost the public hundreds of millions of dollars and yield a relatively small amount of very expensive water. To date, no water interests have offered to purchase the project's expensive water or share construction costs.

Dam Raise/Reservoir Enlargement Options

The Bureau is currently focused on two dam raise and reservoir enlargement options. The options include a 6.5-foot raise that would enlarge the reservoir by 290,000 acre-feet and a 18.5 foot raise that would enlarge the reservoir by 636,000 acre feet. The Bureau has at this time tabled but not completely eliminated consideration of a 200 foot raise that would more than double the volume of the existing reservoir, with devastating environmental and economic impacts.

How Much Water Will The Dam Raise Produce?

Because dams don't create water (they merely capture rain and snowmelt), the firm yield that can be reliably produced on an annual basis depends on annual rainfall. The hypothetical firm yield of water produced from the 6.5 foot raise ranges from 20,000 to 72,000 acre feet. The hypothetical firm yield of the 18.5 foot raise is 71,000-146,000 acre feet. In comparison, if farmers producing low-value alfalfa were to conserve a mere five percent of the water they consume, it would save nearly one million acre feet of water.

How Much Will The Dam Raise And The Water Cost?

The Bureau currently projects that construction costs for the 6.5-foot raise would range from \$282-356 million, with annual operation/maintenance costs of \$19-20 million. Construction costs for the 18.5 foot raise range from \$408-483 million, with annual costs of \$28-34 million. (Initial dam construction cost estimates are notorious for failing to capture the final actual costs of projects.) Therefore, the cost of the water produced by the options range from \$220-270 per acre-foot. This is not competitive with the \$50 to \$150 per acre-foot currently paid by farmers

who consume most of the developed water in the Central Valley. Urban water users who have the potential to finance a dam project in California, are simply not interested in financing a Shasta raise and are pursuing cheaper and more reliable water supply and quality options.

How Much Additional Electricity Would be Generated by a Raised Dam?

Raising Shasta Dam would increase the dam's total hydropower generation. However, it would require a significant amount of energy to pump the water by the dam to potential users in the San Joaquin Valley or Southern California. An analysis by the Natural Resources Defense Council revealed that, if the water generated by a dam raise were to be pumped to Southern California, it would require more energy than would be generated by the raise, thus making it a net energy consumer

Impacts on the Human and Natural Environment

Native American Tribal Lands/Cultural Values – The existing Shasta Reservoir drowned more than 90% of the Winnemem Wintu Tribe's homeland. Even the smallest proposed raise will drown the Tribe's remaining sacred cultural sites, some of which are still in use today, and would violate state law protecting sacred sites.

Recreation Sites, Infrastructure, & Local Businesses – More than 600 structures will have to be relocated, modified, or protected from the raise. Marinas, campgrounds, roads, bridges, and other structures surrounding the existing reservoir will be adversely affected.

Scenic Values – The dam raise would significantly increase the unsightly "bathtub" ring around Shasta Reservoir. Because the dam does not create water, the height of the reservoir depends on annual precipitation. Increasing the total volume of the reservoir simply means that the reservoir will fill less often. The existing reservoir has only filled 18 times out of the last 50 years. The expanded reservoir would have filled only three out of the previous 20 years.

McCloud River – The dam raise and reservoir expansion would violate state law by drowning nearly two miles of the McCloud River. State law prohibits any new dam or reservoir that adversely affect the river's free flowing condition and wild trout fishery. The reservoir expansion would also drown portions of the upper Sacramento River, Pit River, and Squaw Creek.

Sacramento River – The dam raise would further modify flows downstream in the Sacramento River by capturing additional flood flows and spring run off. These high flows are needed in the lower Sacramento River to drive the erosion/deposition processes (river "meander") that recreates vital riparian and fish spawning habitat.

Rare, Threatened, & Endangered Species – In order to increase water deliveries, the Bureau weakened two key salmon protection measures that constrained the operation of Shasta Dam. These changes will result in more than a 9 percent increase in mortality for the endangered winter run chinook salmon and more than 3.5 percent increase in threatened spring run salmon mortality in critically dry years. It is unclear whether these impacts can or will be fully mitigated by the dam raise. In any case, operating the dam to benefit salmon is largely up to the

Bureau and the agency has already demonstrated its disregard for protecting the river's dwindling fisheries.

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Sources:

Shasta Lake Water Resources Investigation, Bureau of Reclamation, 2004.
Trinity River Restoration Project Revised EIS (2004 – unpublished).