



PRUNUSKE CHATHAM, INC.

BIG SULPHUR CREEK FISH LADDER, 2005 TO PRESENT

Client: Calpine

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In 2002, representatives from NOAA Fisheries and California Department of Fish and Game (CDFG) met with Calpine staff to initiate discussions for a fish passage improvement project at a road crossing over Big Sulphur Creek at The Geysers geothermal area in northeastern Sonoma County. The box culvert was determined to be a partial barrier, blocking upstream fish passage at lower migration flows due to insufficient depth and at higher migration flows due to excessive water velocities. Calpine retained Michael Love to develop a design for a pool and chute fish ladder.



Before: Box Culvert on Big Sulphur Creek

Beginning in 2007 PCI provided regulatory compliance, engineering consulting, and permit acquisition services for the project. PCI prepared an Initial Study, Mitigated Negative Declaration, and Mitigation Monitoring Reporting Plan for CDFG as lead agency. PCI also obtained permits, including County building, zoning, and roiling, CDFG \$1602, CWA \$401 and \$404, and ESA incidental take permit (ITP) from NOAA Fisheries Service to move listed steelhead. To allow installation of the fish ladder within an existing bridge, PCI negotiated an exemption from NOAA Fisheries on the fish jump-height engineering specification.



After: Box Culvert with Pool & Chute Fish Ladder

Calpine then retained PCI as prime construction contractor to build the fish ladder. PCI teamed with Granite Construction Company for the concrete work and began construction in July 2008. The weirs are shaped to create stable streaming flow conditions with less turbulent conditions along the margins at moderate to high flows. Ladder steps provide juvenile passage at lower flows. During construction, PCI conducted site dewatering and aquatic animal rescue. Four species of fish were relocated including steelhead trout, California roach, Sacramento sucker, and lamprey, as well as foothill yellow-legged frogs, California giant salamanders, and red-bellied newts.

Work was completed in October 2008. An early October storm watered up the ladder, and resident fish have been observed using it ever since. In 2009, the fish ladder was nominated for the Governor's Award. PCI is currently monitoring the erosion control and revegetation work and is conducting hydraulic evaluation of the ladder to ensure compliance with fish passage design criteria.