

Marshall Ranch Flow Enhancement Project Fact Sheet

The Marshall Ranch Flow Enhancement project consists of the construction of a 15.3 million gallon off-stream pond that will deliver 50 gallons per minute of instream flow to 5.5 miles of Redwood Creek. The main project team consists of Salmonid Restoration Federation, engineers from Stillwater Sciences, and representatives of the Marshall Ranch LLC (landowner).

Need for the Project:

- The South Fork Eel River is key to the recovery of Coho Salmon in the Southern Oregon Northern California Coastal (SONNCC) Evolutionary Significant Unit.
- The California Water Action Plan ranked the South Fork Eel River as 1 of 5 priority watershed for Flow Enhancement in California.
- Redwood Creek, SF Eel suffers from chronic low flows in the dry season where pools become disconnected and water temperature is lethal for juvenile salmonids.
- This region is at high-risk of catastrophic fire and pond would support firefighting efforts
- Forested tributaries like Redwood Creek provide refugia habitat for threatened juvenile Coho salmon but suffer from the cumulative impacts of legacy logging and unregulated water diversions

Project Site Selection

- Located on Redwood Creek, South Fork Eel River, Humboldt County, CA.
- The South Fork Eel has been identified as a priority watershed for Coho salmon recovery and one of the highest priority watersheds in the state for flow enhancement.
- Land is owned by the Marshall Ranch LLC, which manages the 2,942-acre ranch conservation easement that was written to allow for a flow enhancement project
- The Marshall Ranch is the largest contiguous parcel in the watershed
- This site is located in an economically disadvantaged community

The proposed pond location is uniquely suited for the project due to the following factors:

- 1) The project area is comprised of a broad area with gentle topography
- 2) The site is not within the Redwood Creek floodplain or within the potential Redwood Creek channel migration corridor
- 3) There are no watercourses, wetlands, trees or other sensitive plant species within the proposed pond footprint so environmental impacts are minimal
- 4) The pond site is located at an elevation with enough pressure head to deliver the entire pond volume to Redwood Creek by gravity
- 5) The Marshall Ranch LLC (landowner) is fully supportive of the project.

Design and Safety Measures

- Pond is located on a stable geomorphic terrace feature and extensive slope stability analyses have been conducted. A peer review seismic analysis is underway.

- Sensors will be installed to monitor flow and water quality
- The water will be drawn out of the bottom of the reservoir, and the depth will keep that water cool. There is also a nearby downstream reach where approximately 30 gallons per minute flow below gravel, which will cool the water further.
- 7.5 KW solar array grid intertie system and associated infrastructure to offset annual power use and ensure that the project itself including valves, sensors, internet connection, etc. will be operational in a power outage
- The vast majority of pond volume will be created by excavating a large trough in the terrace - lowering the pond elevation will significantly reduce the weight on the existing terrace.
- Creating a rock-lined spillway will increase longevity and reduce long-term maintenance costs.
- Installation of a pond liner, French drain, and subsurface restrictive barrier will reduce seepage concerns.
- Proposed design modifications have been reviewed by technical advisors from the California Department of Fish and Wildlife, North Coast Regional Water Quality Control Board, NOAA Fisheries, and the State Water Board

Benefits

- The main purpose of this project is to augment instream flows to benefit juvenile salmonids which use Redwood Creek for rearing habitat.
- The reservoir release of 50 gpm (gallons per minute) during the dry season would allow for fish migration and sufficient instream flows to support juvenile salmonids.
- Fire suppression: the pond will be accessible for helicopters to dip their buckets and a fire hydrant gravity fed from the pond will be available for access by fire engines during emergencies.
- Efficiency: the flow enhancement achieved by this project would be equivalent to 240 individual 50,000 gallon ponds.

More information about this project, including the [90% Basis of Design](https://www.calsalmon.org/programs/marshall-ranch-flow-enhancement), is available here:
<https://www.calsalmon.org/programs/marshall-ranch-flow-enhancement>

Additional Work in Redwood Creek

- SRF has been monitoring dry season streamflows in this watershed since 2013
- SRF is proactively working to identify potential storage and forbearance options for landowners downstream of the proposed offstream pond.
- SRF is scoping potential flow enhancement projects in the headwaters of Redwood Creek to enhance coho salmon habitat

More information about Redwood Creek low flow monitoring can be found here:
<https://www.calsalmon.org/programs/redwood-creek-low-flow-monitoring>