



NONPOINT SOURCE SUCCESS STORY

California

Implementing Agricultural Best Management Practices Reduces Nutrients in 36 miles of the Napa River

Waterbody Improved

Nonpoint source-related nutrient loading from onsite wastewater treatment systems and agricultural lands contributed to high nutrient levels in the Napa River. As a result, the Napa River was added to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 1976 for nutrients (excess nitrogen and phosphorus). Landowners, local watershed organizations, and many federal, state and local government agencies collaborated to implement nonpoint and point source control measures to reduce nutrient loading to the river. Due to these efforts, nutrient levels have decreased, and the non-tidal portion (36 miles) of the river has been recommended for removal from the CWA section 303(d) list for nutrient impairment.

Problem

The Napa River watershed is in the California Coast Ranges north of San Pablo Bay and San Francisco Bay. It covers an area of approximately 426 square miles and is a spawning ground for the endangered Chinook Salmon and Steelhead Trout. The river's main stem is 65 miles long (Figure 1).

The main nonpoint sources of nutrients are onsite wastewater treatment systems, grazing lands, confined animal facilities, agriculture/ vineyards, wildlife, direct wet and dry atmospheric deposition, and ground water discharges. Point sources of nutrients include municipal wastewater treatment facilities, failing sanitary sewer collection systems and municipal runoff.

In 1976 the river was identified on California's CWA section 303(d) list as impaired by nutrients resulting in eutrophication. Eutrophic waters can alter dissolved oxygen levels and pH, which can cause failure to attain beneficial uses including cold freshwater habitat, warm freshwater habitat, agricultural supply, municipal and domestic supply, water contact recreation and noncontact water recreation. The river is also listed as impaired for pathogens and sediment, and the Regional Water Quality Control Board 2 (RWQCB-2) has produced total maximum daily loads (TMDLs) to address those impairments (2008 for pathogens and 2011 for sediment).

Project Highlights

Major activities that helped reduce nutrient loads to the river since the 1976 listing include:

- Reducing grazed rangeland acreage and the number of confined animal facilities, as well as improving conservation management.
- Adding language in National Pollutant Discharge Elimination System (NPDES) wastewater treatment plant permits in the 1980s prohibiting dry-season (May–Oct) wastewater discharges to the river.
- Developing ranch/farm plans for nutrient and sediment controls and stream bank stabilization.

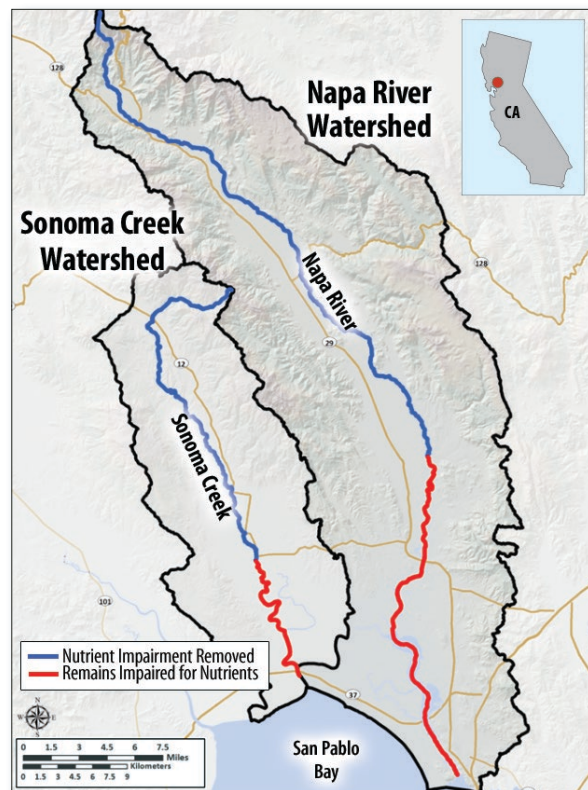


Figure 1. The Napa River and Sonoma Creek watersheds are on the California coast.

- Funding sediment reduction projects (e.g., stream bank stabilization) using 319 funds since 1992.
- Implementing the Fish Friendly Farming (FFF) program to provide technical assistance to vineyard landowners and managers with site assessments and the development of farm plans to control nutrients and sediments.
- Issuing the 2003 general Waste Discharge Requirements (WDRs) for confined animal facilities (currently being updated), and Issuing the 2003 conditional waivers of WDRs for confined animal facilities re-issued in 2015).
- Implementing the 2011 waiver of WDRs for grazing operations to reduce loads from rangelands.

Moving forward, RWQCB-2 is developing a program to regulate discharges of sediment and nutrients from vineyards. Continued success in reducing nutrients in the river will rely on active third-party watershed programs such as FFF, as well as the implementation of farm conservation plans, nutrient management plans, waste management system plans, and ranch water quality control plans.

Results

Current water quality conditions in the river determined from data collected between 2002 and 2012 show that nutrient-related numeric and narrative water quality objectives are being met and impacted beneficial uses are supported. Although data collected showed limited exceedances for three of eight lines of evidence for nutrient impairment, these exceedances were within what is allowed in the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* specifications based on the analyte sample sizes (Table 1). On the basis of these data, it is anticipated that the State Board will recommend removal of the non-tidal

portion (36 miles) of the river from the state's list of impaired waters for nutrients in the next listing cycle. The original 65-mile-long segment is being split into two segments: a 36-mile-long non-tidal segment and a 29-mile-long tidally influenced segment.

Partners and Funding

Guidance provided by the U.S. Department of Agriculture National Resources Conservation Service (NRCS), University of California (UC) Cooperative Extension, and local resource conservation districts (RCDs) was key to the adoption of improved agricultural best management practices (BMPs). This work, combined with increased water quality regulation, changes in land use and implementation of better agricultural practices, have contributed to reductions in nutrient inputs and improvements in water quality.

The major partners include U.S. Environmental Protection Agency, California State Water Resources Control Board, RWQCB-2, NRCS, Napa County RCD, Napa County Agricultural Commissioner, Napa Valley Vintners Association, Napa County Grapegrowers Association, Napa County Farm Bureau, Napa County, Rutherford Dust Society, California Land Stewardship Institute (managers of the FFF program), UC Cooperative Extension, Napa Vintners, California Coastal Conservancy, Watershed Information Center and Conservancy of Napa, San Francisco Estuary Partnership, vineyard owners and contractors.

To date, California has invested at least \$3,759,659 of CWA section 319(h) funds through nine projects that supported watershed coordination and agricultural BMP implementation. RWQCB-2 staff members responsible for program implementation were supported with CWA section 319 grant funding.

Table 1. Napa River, Summary of Line of Evidence and Exceedances of Evaluation Guidelines

Line of Evidence	Analyte	Numeric Evaluation Guideline ¹	Number of Exceedances Per Total Samples	Evaluation Metric ²
1	Benthic biomass chlorophyll <i>a</i>	< 150 mg/m ²	2 of 16	Evaluation Guideline (a)
2	Percent macro-algae cover	30%	2 of 17	Evaluation Guideline (a)
3	Water column chlorophyll <i>a</i>	15 µg/L	1 of 40	Evaluation Guideline (a)
4	Nitrite	1 mg/L	0 of 120	Water Quality Objective (b)
5	Nitrate+ Nitrite	10 mg/L	0 of 120	Water Quality Objective (b)
6	Ammonia, un-ionized	0.025 mg/L	0 of 6	Water Quality Objective (b)
7	Ammonia, total	0.1–2.8 mg/L	0 of 120	U.S. EPA Criterion (b)
8	pH	6.5–8.5 units	0 of 24	Water Quality Objective (b)

Notes:

¹ mg/m² = milligrams per square meter; µg/L = micrograms per liter; mg/L = milligrams per liter

² (a) = Listing Factor 4.11, weight of evidence (b) = Listing Factor 4.1, toxicant

(Listing Factor Source: http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf)



U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-15-001JJJ
December 2015

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