

Regional Water Quality Control Board
North Coast Region

Executive Officer's Summary Report
Thursday, August 11, 2016
Regional Water Board Office
Santa Rosa, California

ITEM: 3

SUBJECT: Garcia River Monitoring Program – Overview, Status and Trends (*Jonathan Warmerdam, Regional Water Board and Jennifer Carah, The Nature Conservancy*)

BOARD ACTION: This is an informational item only. No action will be taken by the Regional Water Board.

BACKGROUND: In 2007, The Nature Conservancy and the North Coast Regional Water Quality Control Board (Regional Water Board) initiated a new, watershed-wide monitoring program known as the Garcia River Monitoring Program. The purpose of the monitoring program is to identify the physical, chemical, and biological conditions of the Garcia River watershed and to track the trajectory of its conditions over time. A formal report on the findings of the Garcia River Monitoring Program is currently being finalized and forms the basis for this informational item.

DISCUSSION: The Garcia River is impaired from excess sediment and elevated water temperatures due to human land-disturbing activities that have been occurring in the watershed during the last two centuries. The legacy of impacts from these activities - land clearing, agriculture, grazing, forest conversion, splash dam logging, industrial logging, road building, gravel mining, and more - are still present today.

But the watershed is also on a trajectory towards recovery. Watershed-wide sediment control efforts, sustainable forest management, and instream habitat restoration are accelerating the path towards recovery. Forests are growing back, erosion scars are healing over, and land use practices are improving. The salmon and trout species that have been present in the watershed for eons continue to return, although in greatly reduced numbers.

In 2002, the Regional Water Board adopted a new regulatory strategy, termed a Total Maximum Daily Load (TMDL), to address the sediment impairment. The goal of the TMDL was simple: control the remaining sources of excess erosion across the landscape in order to accelerate the recovery of the watershed from the legacy impacts of the past. This effort - the first of its kind in the nation - set the goal of reversing the watershed's sediment impairment and recovering the health of the river by the year 2049.

Today, a diverse makeup of landowners - private, non-profit, industrial timber, and agricultural - who own more than 80% of the watershed area are participating in the implementation of the TMDL. With support from multiple stakeholders - environmental organizations, state and federal agencies, resource conservation district, and professional

consultants - the landowners have greatly reduced the amount of sediment contribution to the Garcia River and its tributaries, and are accelerating the process towards recovery.

In 2004, a coalition of conservation organizations purchased the largest single property in the watershed for the purpose of demonstrating sustainable forest management, implementing watershed restoration, and conducting scientific research. The Conservation Fund took ownership of the property and renamed the property the "Garcia River Forest." The Nature Conservancy (TNC) owns a conservation easement on the property. The Conservation Fund and its partners have expedited sediment control efforts across the property, implemented miles of stream habitat restoration for salmon and trout, and engaged in innovative land-stewardship activities.

In 2006, staff from TNC and the Regional Water Board began collaborating to develop and implement a new water quality monitoring program to identify the physical, chemical, and biological conditions of the watershed and track trajectory of its conditions over time. TNC's and the Regional Water Board's shared goals for the watershed - sustainable land management and recovery of instream habitat conditions - made for an ideal and compatible partnership for a water quality monitoring program.

The specific goals of the Garcia River Monitoring Program are: (1) to assess and monitor the quality and quantity of water in the Garcia River watershed as it relates to the targets outlined in the Regional Water Board's Garcia TMDL Action Plan, (2) measure progress towards meeting management goals on the Garcia River Forest ownership and inform development of management strategies there, and (3) provide data on the baseline status and any detectable trends of the Garcia River to other federal and state agencies, tribal governments, and stakeholders.

TNC and Regional Water Board staff coordinated several meetings with technical experts¹ in the monitoring field to seek advice on development of a monitoring program that could serve these mutual goals and to discuss various monitoring methodologies and existing monitoring programs. A necessary aspect of any candidate monitoring program was the ability to establish baseline conditions and conduct change analysis for the watershed. The key to trend monitoring is to establish representative reference sites for physical, chemical, and biological monitoring variables to evaluate change over time.

TNC and the Regional Water Board agreed on the U.S. Environmental Protection Agency's (U.S. EPA) Environmental Monitoring and Assessment Program² (EMAP-West) as the basis

¹ Technical experts consulted during development of the Garcia River Monitoring Program included representatives from state and federal regulatory agencies, educational institutions, environmental consultants, and stakeholders such as: National Marine Fisheries Service, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, North Coast Regional Water Quality Control Board, Bureau of Land Management, U.C. Davis, U.C. Berkeley, Stillwater Sciences, Pacific Watershed Associates, The Nature Conservancy, The Conservation Fund, and the Mendocino Redwood Company.

² Following the inception of the Garcia River Monitoring Program in 2007, the U.S. EPA incorporated the EMAP-West standard operating procedures into the expanded National Rivers and Stream Assessment (NRSA) Field Operations Manual (2009). The protocols described in the NRSA for wadeable streams are the same as those from EMAP-West, and can found online at the following location:
https://www.epa.gov/sites/production/files/2013-11/documents/nrsa_field_manual_4_21_09.pdf.

for the Garcia River Monitoring Program. EMAP-West has been used extensively throughout California already, and was the basis for the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP) Standard Operating Procedures³ for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California (Fetscher et al. 2010).

The EMAP-West and SWAMP protocols provide standardized operating procedures to collect a large amount of monitoring information regarding the physical, chemical, and biological conditions of a surveyed stream reach. The EMAP approach (through spatially balanced, probability-based sampling design - a.k.a. stratified random design), provides a statistically-valid basis for determining aquatic ecological baseline conditions. In addition, the EMAP and SWAMP protocols can provide quantifiable estimates of the environmental benefits from conservation actions and restoration activities. It is hoped that by using EMAP sampling design and protocols, a long-term monitoring dataset will be created whereby the data collected in the Garcia River can be used to help understand watershed recovery and develop regional standards that inform management of other North Coast rivers. All of the SWAMP monitoring data is inputted into the California Environmental Data Exchange Network (CEDEN), a publicly available database of water quality monitoring data.

RECOMMENDATION: N/A

SUPPORTING DOCUMENTS: N/A

³ The SWAMP bioassessment procedures are close modifications of the EMAP protocols and differ substantively in only a few collection procedures. The SWAMP protocols can be found online at the following location: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/sop_algae.pdf.