

## Overview

Along the Sacramento River, restoration has been a regional and state goal for almost two decades. There has been little systematic evaluation of the extent to which these projects have influenced the overall ecological status of the Sacramento River system.

The Sacramento River Monitoring and Assessment Project (SRMAP), funded by CALFED in 2007, combines state-of-the-art Geographical Information Systems (GIS) analysis and the expertise of leading north state researchers to assess current conditions and change in riparian vegetation and river dynamics on the Sacramento River.

### Project Goal

To quantitatively assess the extent to which restoration has impacted the overall health of the Sacramento River ecosystem.

The project is a synthesis of three separate 2005 CALFED proposals into one project culminating in a comprehensive approach to monitoring and assessing ecosystem health along the Sacramento River. It represents a diverse project team from researchers from UC Davis, CSU Chico, UC Santa Cruz, and The Nature Conservancy.

The Sacramento River Monitoring and Assessment Project comprises five key components: the Sacramento River Riparian Map, vegetation analysis, channel morphology and dynamics analysis, Sacramento River ecosystem scorecard and monitoring plan.



## Public Information & Participation

Via the GIC's Sacramento River Website (<http://www.sacramentoriver.org/>), monitoring data collected for SRMAP will be provided in a database to be available to other stakeholders and researchers. The website will host a wide range of spatial data from the Sacramento River, including the 1999 and 2007 Riparian Maps, with associated metadata.

The Sacramento River Website will also host a series of orthorectified historical aerial photographs of the study reach, including the 2007 flight. Aerial data files from 1938, 1952, 1978 and riparian atlases at 5-year intervals from 1950-1990 will available to the public for download.

In addition to the vegetation data and aerial files, historic and current geomorphic geographic information system (GIS) files will be on the website with the intent to aid further research in change detection along the Sacramento

### Project Updates & Public Workshops

The Sacramento River Conservation Area Forum (SRCAF) will assist public outreach by circulating project documents and workshop notices. The SRMAP project team will regularly give public updates on the project at the SRCAF Board and Technical Advisory Committee meetings and through the SRCAF Project Tracker.

### For More Information on SRMAP

Project Presentation:  
<http://www.sacramentoriver.org/SRCAF/publications/SRMAPPresSRCAF092007.pdf>

Project Updates:  
[http://www.srcafprojecttracker.org/ProjectTrak/ProjectTrack\\_Details.aspx?var1=127](http://www.srcafprojecttracker.org/ProjectTrak/ProjectTrack_Details.aspx?var1=127)

SRMAP Public Access Data:  
<http://www.sacramentoriver.org/>

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Sacramento River Monitoring and Assessment Project

# Sacramento River Monitoring and Assessment Project

## A Multidisciplinary Approach to Determining Ecosystem Health



Project Period: April 1, 2007 – June 30, 2009  
Red Bluff to Colusa Ecological Management Zone

### Project Partners:

**CSU, Chico**  
Kristin Cooper-Carter  
Dr. David Wood  
Chuck Nelson

**UC, Davis**  
Dr. Eric Larsen  
Dr. Fraser Shilling  
Dr. Joshua Viers

**UC, Santa Cruz**  
Dr. Karen Holl

**The Nature Conservancy**  
Dr. Greg Golet

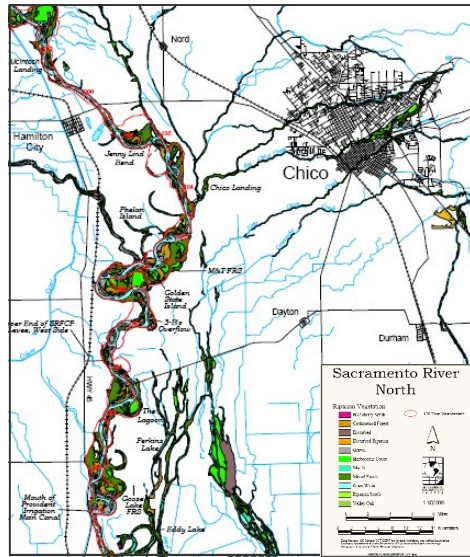
**Sacramento River Conservation Area Forum**  
Beverly Anderson

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## 2007 Riparian Map

Using the June 2007 aerial photographs, Chuck Nelson, Director of the CSU, Chico Geographical Information Center (GIC), will create a new 2007 Riparian Map using the California Native Plant Society Rapid Assessment survey methods for delineating vegetation communities. To ensure the map's accuracy, UC Davis ecologist, Dr. Joshua Viers will employ a map validation procedure, using an iterative series of statistical analyses.

In addition to vegetation types, the 2007 Riparian Map will include channel location and attributes,



Excerpt from the 1999 Riparian Map

## Cross-walk to the 1999 Riparian Map

UC Davis researchers and the CSU, Chico Geographical Information Center will employ a quality assurance procedure for the cross-walk comparison between the 1999 riparian map and the new 2007 riparian vegetation map.

## Vegetation Analysis

Evaluating the change in riparian habitat complexity and riparian vegetative understory as a function of landscape variables

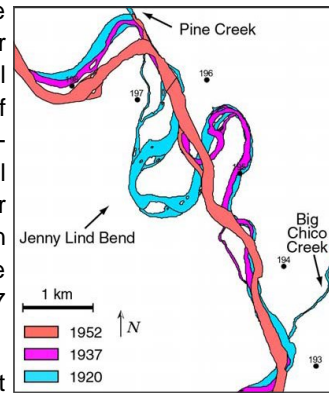
To determine the extent to which restoration projects have improved habitat complexity in the Sacramento River ecosystem, two complementary studies are planned. More than 100 vegetation sites will be revisited to conduct a rigorous analysis of vegetation change over seven years. Dr. Dave Wood, CSU, Chico, will study change in vegetation complexity at riparian restoration sites, remnant riparian sites and selected gravel bars. Dr. Karen Holl will analyze understory communities as a function of landscape

## Channel Morphology and Dynamics

Documenting floodplain development and linking river dynamics with vegetation patterns

Geomorphologist Dr. Eric Larsen, UC Davis Department of Geology, will produce channel maps delineating and classifying river channel shape and floodplain features within the project reach.

These maps will be used to calculate river sinuosity, cutoff potential and other indicators of dynamic riverine processes. Historic channel morphology data (for existing periods between 1904 and 1997) will be compared to the 2007 channel data.



Historical Channel Movement, Sacramento

This analysis will result in measurements of the degree to which the River is actively creating new habitats. The analysis will also include patterns of sediment deposition and a measurement of river processes which created the floodplain.

Previously, ecosystem research on the Sacramento River had been done in relative isolation. Ultimately, this project will contribute to greater synergy between research and policy on the Sacramento River.

## Sacramento River "Scorecard"

The culmination of SRMAP research, the Sacramento River Ecological "Scorecard" will comprise key ecosystem indicators necessary to determine the River's response to restoration measures. Ecologists Dr. Greg Golet, The Nature Conservancy, and Dr. Fraser Shilling, UC Davis, will take the lead in consulting with SRMAP researchers and scientists external to the project to select indicators and acquire available indicator data. Examples of indicator data include native vegetation complexity, non-native species cover, floodplain age and elevation, channel curvature, bank erosion, landbird abundance, and Valley Elderberry Longhorn Beetle (VELB) occupancy.



Indicator data will be re-scaled to common "condition scores" (ranging from 1-100) following methods described by the US-EPA Advisory Board and current scientific literature. Using SRMAP vegetation and channel data and existing landbird and VELB data (from Point Reyes Bird Observatory and Drs. Holyoak and Talley, UC Davis), the Sacramento River Ecosystem "Scorecard" will be used for making

## Sacramento River Monitoring Plan

Finally, in consultation with SRMAP researchers, external scientists, land managers and restoration practitioners, Drs. Greg Golet and Fraser Shilling will collaboratively develop a systematic monitoring plan for the Red Bluff to Colusa Ecological Management Zone. The plan will consist of specific field sampling protocols for monitoring, sampling times and locations as well as procedures for selecting additional sampling sites, and appropriate analytical and statistical techniques for evaluating monitoring data.