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**MORO COJO SLOUGH**

2012



Codges Family Foundation  
Moss Landing Marine Laboratories  
Coastal Conservation & Research

# Moro Cojo Slough

## Management and Enhancement Plan

### Status Report

June 2013

Central Coast Wetlands Group at  
Moss Landing Marine Laboratories  
Coastal Conservation and Research





**The Moro Cojo Slough  
Management and Enhancement Plan**

**Status Report**

June 24, 2013

Prepared by:

**Central Coast Wetlands Group at Moss Landing Marine Laboratories**

Kevin O'Connor, Project Manager

Ross Clark, Director

Sarah Stoner-Duncan, Project Associate

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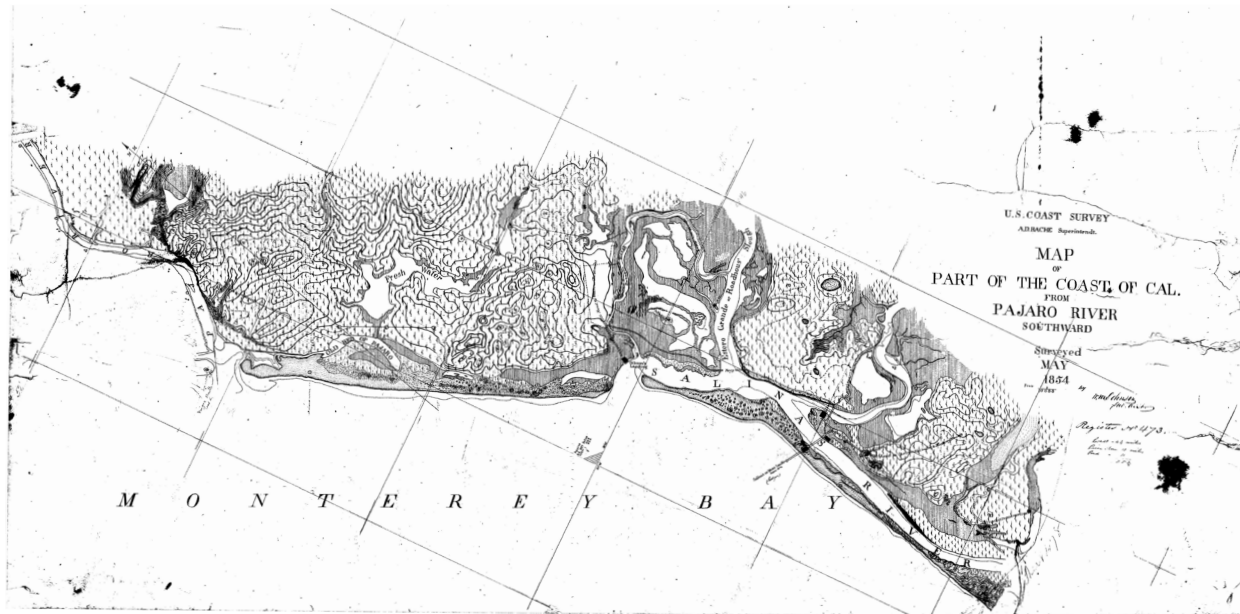
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**Excerpt from The Castroville Argus, Dec. 4, 1869**

*It is astonishing to see the number of wild fowl that have taken up their abode for the winter in this vicinity, and fly back and forth between the lakes and sloughs where they rest, and the fields and marshes, where they feed. The air is sometimes positively alive with them for miles, and their clangor is almost deafening. All kinds are represented, from the useless and ugly mudhen to the coveted "honker."*



Moro Cojo National Geodetic Survey map, 1853

# *Preface*

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Many environmental organizations, research institutions, and landowners have stepped forward to initiate the implementation of the Moro Cojo Slough Management and Enhancement Plan and have demonstrated their dedication to restoring, enhancing, and protecting natural habitats within the Moro Cojo Slough watershed. Properties within the Moro Cojo watershed have varied histories, but most have been subject to farming, grazing, diking, urban development, or other anthropogenic impacts for the last century or more. As such, much of their habitat value has been substantially degraded.

This status report describes the multiple environmental and water quality problems identified in the Moro Cojo Slough Management and Enhancement Plan (Lyons & Gilchrist, 1996), and the efforts underway to implement measures that address the primary goals and objectives of these plans.

Enhancement and restoration of wetlands, floodplains, and adjacent upland habitats of the Moro Cojo Slough increase biological resource values and reduce impacts of human activities on wetland resources (particularly those that affect water quality and natural hydrology). Furthermore, this report describes the use of Best Management Practices (BMPs) within the watershed, while simultaneously providing natural resource educational and research opportunities.

While there is no lead organization charged with the implementation of the Management Plan, the Central Coast Wetlands Group has worked with a number of partners to ensure its implementation by restoring the environmental values of this important wetland complex.



1.

## *Introduction to the Watershed*

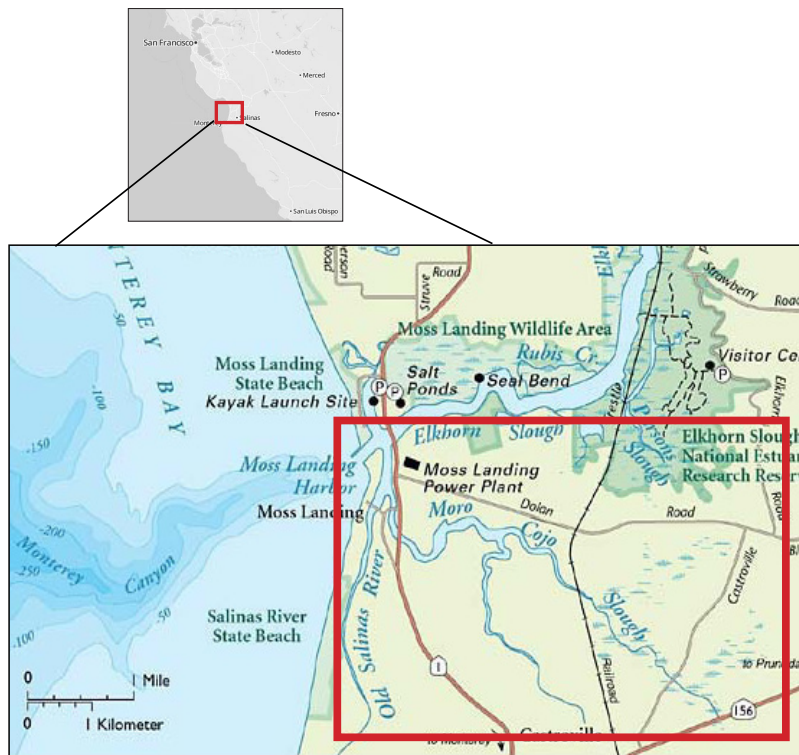
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*The Moro Cojo watershed supports multiple land uses*

## LOCATION

Located on California's Central Coast, the Moro Cojo Slough drains a 17 square mile watershed with its mouth emptying into Moss Landing Harbor in the center of Monterey Bay. The Moro Cojo Slough is linked with the large Salinas River watershed to the south and the Elkhorn Slough watershed to the north.



## NATURAL HISTORY

### Habitats and Flora

Habitats within the Moro Cojo watershed are comprised of coastal salt marsh, freshwater marsh, perennial and seasonally inundated freshwater and brackish water ponds, arroyo willow riparian forest, grasslands (both coastal alkali and mixed non-native), maritime chapparral, coast live oak woodland, coyote bush scrub, as well as hypersaline ponded areas, mudflats, and tidal creeks and channels.

The diverse habitats within the Moro Cojo watershed support a wide variety of vegetation communities. Although most of the upland grasslands are dominated by non-native grasses, patches of native grasses exist throughout most of the watershed. Upland shrub habitats are dominated primarily by coyote bush and scrub and scattered oak woodlands. Thick stands of hemlock and mustard (both non-native species) occur in patches throughout the watershed; these patches are usually found in highly disturbed areas. Composition of wetland plant communities range from saline indicators (pickleweed) to freshwater emergent vegetation (cattail, sedges, and rushes). Oak woodlands, with pockets of invasive Eucalyptus, comprise a large portion of the upper watershed landscape (CCR, 2007).

### Fauna

The Moro Cojo provides habitat for more than twenty native vertebrates and an abundance of migratory waterfowl. Further, the slough provides representation of rare brackish and freshwater habitats that support threatened species such as the California red-legged Frog, California tiger salamander, steelhead, Santa Cruz long-toed salamander, and tidewater goby (CCR, 2007).

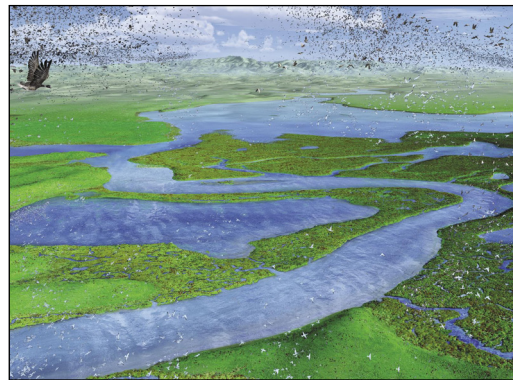
## HISTORY of HUMAN INFLUENCE

Up until the late 1800's the Moro Cojo Slough encompassed vast expanses of fresh and brackish water wetlands that supported a rich community of wildlife, and acted as a sponge filtering sediments from the water, preventing erosion, reducing the threat of flood, and recharging shallow freshwater aquifers (Gordon, 1974).



*Underground water map, 1901*

In the early 20th century much of the seasonal estuarine habitat of the slough was “reclaimed” for farming and grazing primarily through ditching, levees and berms. Also during this time shallow groundwater in the Moss Landing area was lost due to over pumping for irrigation. Uplands above the ten foot contour were converted into either row crop agriculture (e.g. artichokes, brussel sprouts, etc.) or industry (a power plant and a magnesium hydroxide plant). Additionally the construction of Moss Landing Harbor entrance, installation of tidal control structures, and the Pajaro Valley railroad severely altered water movement within the slough.



*Artistic rendering of pre-Columbian Moro Cojo*

## CURRENT STATE

The Moro Cojo Slough, like many California watersheds, is highly degraded and retains only small remnants of the fresh and brackish water wetlands that existed historically. Today, the remaining wetlands create a patchwork of fragmented but valuable aquatic habitats. The installation of dikes and berms has reduced the amount of marsh and aquatic habitat in the slough that is essential for the support of brackish water snail, tidewater goby, migratory birds and endemic amphibians such as the tiger salamander (CCoWS, 2005).

Approximately 40% of the water draining into the Monterey Bay National Marine Sanctuary flows through the Salinas River complex. These waters are well documented by the State and Regional Boards as impaired by numerous urban and agriculture related pollutants. Specifically, the Moro Cojo Slough is impaired (listed on the current California 303d list) by pesticides, sedimentation, bacteria, and nutrients. Seven Total Maximum Daily Load Action Plans (TMDLs) are scheduled for the Slough. High levels of nickel, dieldrin, total DDT, toxaphene, and PCBs are present in the slough. (SWRCB 1998, RWQCB, 2013)



*Current photo of the Moro Cojo*

## WATERSHED IMPROVEMENT EFFORTS

Fortunately, there is enormous potential to restore the vast majority of this watershed. Unlike estuaries of Southern California and the San Francisco Bay, the Moro Cojo Slough is surrounded by rural agricultural land uses, making future restoration economically viable. Landscapes associated with urban development, which limit restoration opportunity, are minimal within the watershed.

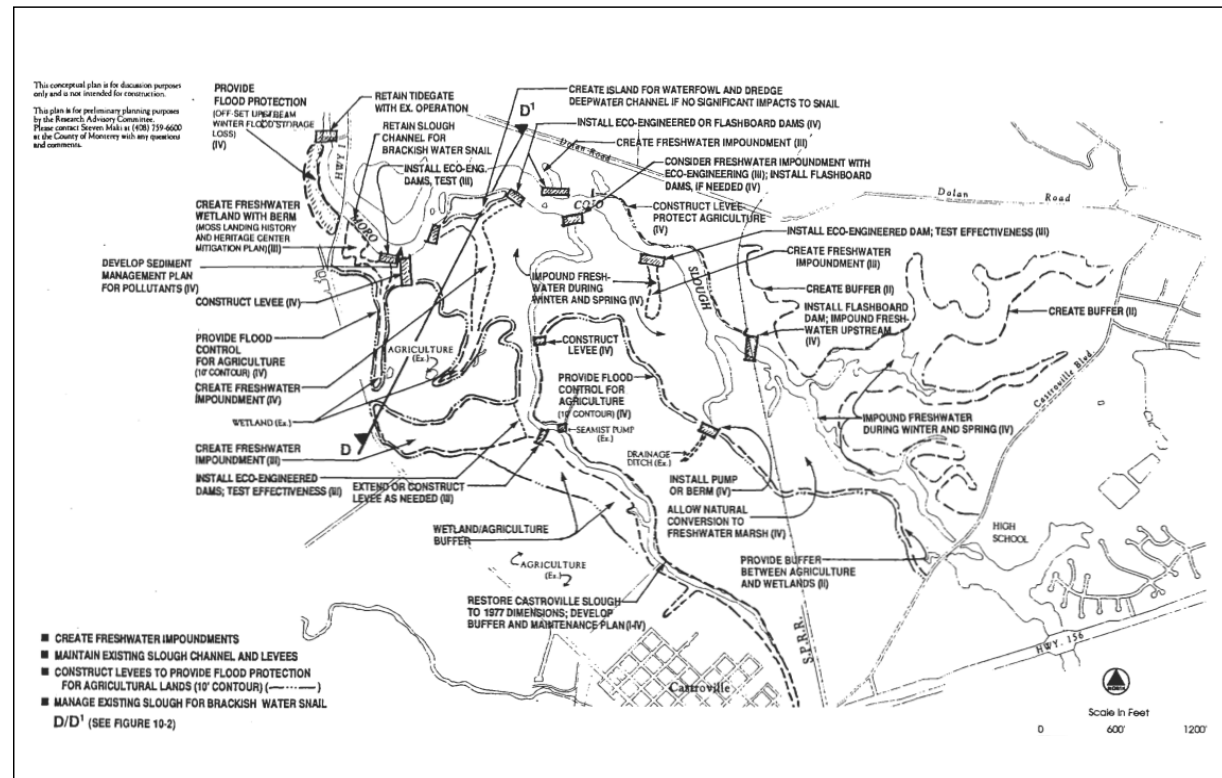
Because the farming community has been an active supporter of the Moro Cojo Plan, a considerable amount of work has gone into the restoration of unproductive farming in the lower sections of this watershed. Large tracts of land have been set aside for restoration through acquisition or easement by local non-profit organizations. Treatment wetlands have been installed at several points along the slough and research has documented the benefit of these actions in improving both water quality and the diversity of flora and fauna. In cooperation with local landowners buffer zones have been established along sizable sections of the slough's perimeter. Additionally, ongoing collaborations with local elementary, high school, and universities help to instill an appreciation of the values of both conservation and restoration within a new generation of environmental stewards.



*Native Grindelia planted at the Sea Mist Ponds*

2.

## Planning in the Watershed



Moro Cojo Management and Enhancement Plan preferred plan for the lower watershed

## COMMON THEMES OF PERTINENT PLANNING DOCUMENTS

### Wet corridor construction

The Salinas Valley has lost a majority of its freshwater wetlands, which combined with over-pumping of groundwater has lead to serious environmental problems such as loss of habitat for endangered species, poor water quality, salt water intrusion into aquifers, and soil erosion. Restored wet corridors increase the rate of groundwater recharge, decreasing salt water intrusion, providing flood control, and improving water quality (Oliver et al., 1997).

### Restoration of floodplain

Water that is allowed to spread out on a flood plain can percolate into the substrate and eventually the shallow aquifers, helping reverse a 50-year trend of seawater intrusion into the coastal aquifers. Wetlands allow for the finest sedimentary particles (which transport pesticides, metals, and other pollutants) to settle out of the water column, preventing the accumulation of these materials in deep water locations such as Moss Landing Harbor (Oliver et al., 1997).

### Upland restoration

The eradication of non-native weeds followed by the planting of native species helps establish a productive buffer that can filter water from nearby farms, leading to improved water quality and wetland habitat condition (CCR, 2007).

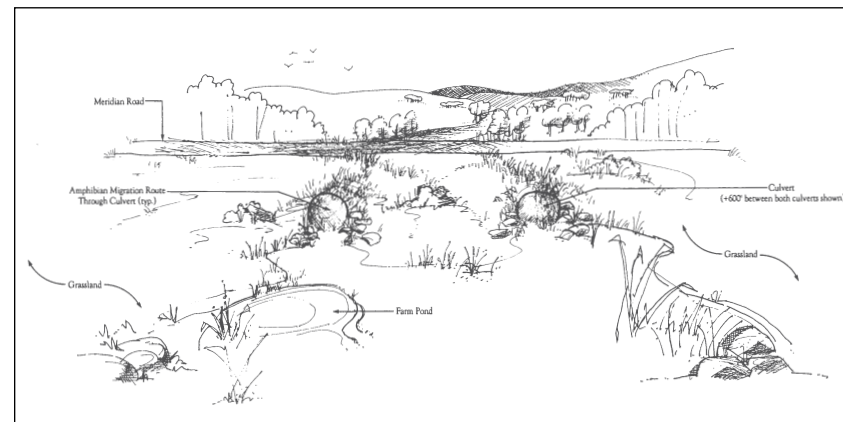
### Public access and education

Most plans recognize the importance of appropriate public access to restoration sites and support of environmental education programs.

## MORO COJO SLOUGH MANAGEMENT AND ENHANCEMENT PLAN (1996)

The Moro Cojo Management and Enhancement Plan was completed to address the degraded nature of this resource. The document describes a preferred alternative to enhance the winter and spring freshwater conditions in the slough by creating multiple impoundments and restoring wet corridors.

The plan was initiated by Monterey County in response to land use conflicts and development pressure within the slough watershed. The plan describes the environmental resources of the Moro Cojo Slough Watershed (hydrologic features, biological resources, agricultural practices, and water quality and land use issues) and examines several alternative management strategies. The preferred strategy includes actions to enhance, restore and manage the significant fresh and brackish water resources on both public and privately-owned lands within the slough system.

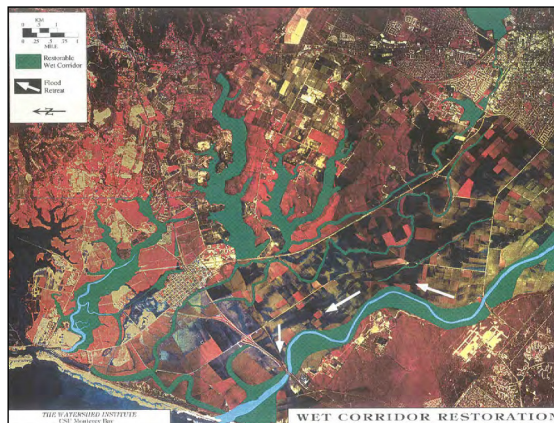


*Schematic of culvert crossings for amphibian migration from the Moro Cojo Management and Enhancement Plan*

## NORTHERN SALINAS VALLEY WATERSHED RESTORATION PLAN (1997)

The Northern Salinas Valley Watershed Restoration Plan is an adaptive water quality management plan describing wetland restoration techniques and opportunities within the water courses that flow through the Gabilan watershed and associated sloughs and drainage ditches of the Northern Salinas Valley (Moro Cojo Tembladero, and Old Salinas River).

The plan outlines how the restoration of former wetland and riparian areas (wet corridors) throughout the target watershed will benefit both aquatic habitat and water quality. The restored wet corridors act as natural sediment and pollutant filters. In addition, they act to improve groundwater recharge, decrease flooding, increase critical habitat areas (lost through historical reclamation projects) and decrease wildfire danger. The report addresses all relevant aspects of wet corridor restoration: benefits, technical approaches, long-term monitoring, landowner permission, public education, and potential barriers to success.



*Potential wet corridor sites in the lower Salinas Valley*

## CENTRAL COAST REGIONAL TOXIC HOTSPOT CLEANUP PLAN (1998)

This Regional Toxic Hot Spot Cleanup Plan (Cleanup Plan) is intended to provide direction for the remediation or prevention of toxic hot spots in the Central Coast Region. Moss Landing Harbor is listed as a high priority candidate toxic hot spot. The report provides a preliminary assessment of actions to address the problems identified at the site and the estimates the costs of implementation.

The listed actions range broadly in focus and scope from the support for education and outreach to developing a variety of tools to control agricultural nonpoint source pollution. Many practices exist which can reduce the delivery of pesticides to waterways. A few of the major approaches which can be utilized by the agricultural community are:

- Maintain a vegetative buffer area between creek drainages and agricultural activities.
- Re-vegetate drainage ways with grass or suitable wetland vegetation.



*Marine Pollutions Studies Lab at MLML*

## ELKHORN SLOUGH WATERSHED CONSERVATION PLAN (1999)

The Elkhorn Slough Conservation Plan, sponsored by The David and Lucile Packard Foundation, was developed to identify and address threats, and to maintain the long-term viability of Elkhorn Slough and its related upland communities as a significant coastal system. The Plan's vision is to preserve an intact and interconnected network of natural communities, including over 4,000 acres of coastal marsh within Elkhorn and Moro Cojo Sloughs, the freshwater wetlands of McClusky Slough, a restored riparian forest in the lower Carneros Creek floodplain and a series of upland ridges with unfragmented maritime chaparral in the Elkhorn Highlands.

### Conservation goals for Moro Cojo Slough

- Protect marshes and adjacent freshwater wetlands and ponds
- Restore lands suitable for natural habitat
- Protect productive agricultural lands surrounding marshes

### Strategies for Moro Cojo Slough

- Acquire key lands to protect and restore marsh habitat; and, where possible, utilize land swaps to secure further protection of natural habitat lands
- Acquire fee or easements on viable farmlands, especially those surrounding wetlands through fee or conservation easement
- Provide adequate wetland buffers
- Restore natural habitat where suitable

## RECLAMATION DITCH WATERSHED ASSESSMENT AND MANAGEMENT STRATEGY (2005)

The Reclamation Ditch Watershed Assessment and Management Strategy was a two-part report focusing on the Gabilan Watershed. The first document was a watershed assessment, which found that the watershed has a unique, nationally vital agricultural economy. Its contemporary landscape is founded on a history of reclaiming land for multiple-uses such as agriculture and urbanization, and protecting all land uses from floods. In the past few decades additional objectives have been introduced, including the need to manage flood events, reduce sedimentation, improve water quality, ensure food safety, and protect special status species.

The Watershed Management Strategy is composed of a list of management goals and a management strategy that sets forth an initial list of priority actions. Specifically, the plan identified ten goals including: Improve water quality, reduce flooding of adjacent developed lands (specifically in the town of Castroville), create natural areas, and reduce impacts to the Moss Landing Harbor.

Example Actions described within the Management Strategy include:

- Implement Conditional Waiver of Waste Discharge Requirements (Agricultural Order No. RB3-2012-0011)
- Conduct Study of Vegetated Treatment Systems (VTS)
- Create / Restore (wetlands/open space)
- Conduct study to evaluate fish passage and status of steelhead
- Conserve habitat for Special Status Species
- Expand research into effects of non-crop vegetation on food safety

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## *Restoration, Conservation and Monitoring in the Watershed*

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*Main channel of the Moro Cojo Slough*

## PHASE 1 IMPLEMENTATION PROJECT (2001-2004)

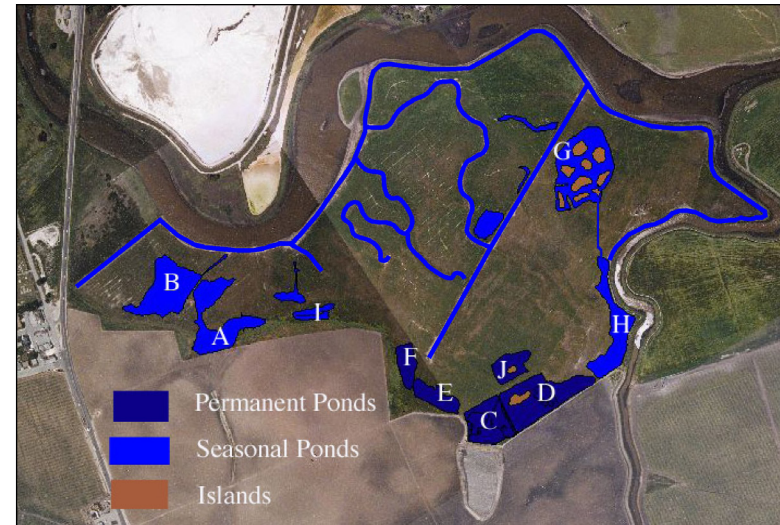
### Background

The first phase of implementation of the Moro Cojo Slough Management and Enhancement Plan was initiated in 2001 with funding from the State Water Resources Control Board. Project partners with input from a Technical Advisory Committee worked on restoring over 330 acres of the Moro Cojo Slough watershed in order to improve water quality, reduce erosion and sedimentation, increase aquifer recharge, and recreate wildlife habitat. All work was done within the context of active agricultural operations and was focused in the lower portion of the watershed between Highway 1 and the Union Pacific railroad crossing.

### Habitat Enhancement

A total of 30 acres of pond habitat were created on the Catellus parcel in the lower slough through the construction of shallow water ponds and diversion of agricultural runoff to these ponds. The establishment of native plants (10,740 plants) and weed control activities took place at multiple sites around the lower slough including the Catellus parcel, Tottino Ponds, Moon Glow Marsh, and the Calcagno parcel along the north side of the main channel of the slough.

One of the major concerns of farmers was that the restoration of native plant and animal communities adjacent to their farmlands would lead to increased damage of crops by pest species attracted by the restoration of native habitat. Project partners worked closely with local landowners to ensure the results of the restoration practices did not have a negative effect on the farming activity of adjacent parcels.



*Wetland ponds established on the Catellus property*



*Catellus property in 2005, post-restoration and enhancement*

## Education and Outreach

Project partners worked with North Monterey County High School science teachers to include the study of watersheds, water quality, and wetland plants and animals in their curriculum. Students helped grow plants at the school greenhouse; planted native plants at the high school and at the Tottino Ponds site; built barn owl, bat, and swallow boxes; and assisted with bird, invertebrate, and water quality monitoring.

## Monitoring

Restoration effectiveness monitoring was conducted at select locations to quantify improvements to water quality, native vegetation and native bird and small mammal populations. Additionally, invertebrate surveys were conducted at the Tottino Ponds site.

## Status

Farmers have modified the drainages leading to the Catellus parcel, reduced freshwater inputs, leading to a smaller wetland area. Recent efforts by the Elkhorn Slough Foundation have prioritized the protection of threatened and endangered species (*Trifolium depauperatum* var. *hydrophilum*) and the establishment of coastal prairies on this parcel, redirecting wetland restoration efforts to other parcels.



North Monterey County High School students planting upland plants at the North County High School site.



Tottino Ponds pre-restoration, 2000



Tottino Ponds post-restoration, 2006

## PHASE II IMPLEMENTATION PROJECT (2004-2008)

### Background

Phase II Implementation of the Moro Cojo Slough Management and Enhancement Plan started in 2004 with continued funding from the State Water Resources Control Board. Specific actions implemented by this project included the enhancement, restoration, and protection of 350 acres of wetlands, floodplains, and adjacent upland habitats on the Sea Mist parcel. This project demonstrated the use and advantages of Best Management Practices (BMPs) to reduce nutrient inputs and restore and enhance natural habitats. The project also established important baseline data on water quality and flora and fauna throughout the watershed, and provided educational opportunities to students and the general public.

### Habitat Enhancement

Three ponds and connecting channels totaling more than 21 acres of shallow fresh water habitat were created on the Sea Mist parcel, just downstream of the Union Pacific Railroad crossing. Water from approximately 150 acres of irrigated agriculture is directed to this restoration site for cleanup and to provide valuable freshwater habitat.

Water was also diverted from Castroville Slough on to the Sea Mist parcel flooding approximately 20 acres. Additionally, the north side of the main channel of the slough was fenced off from cattle providing a unique opportunity for restoration of the main Moro Cojo channel. Wetland and upland habitat were planted or drill seeded with native plant species to provide habitat and reduce erosion.



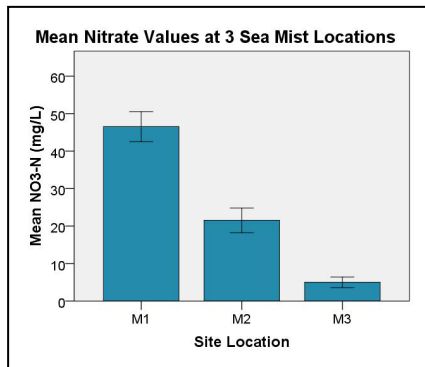
*Birds in the Moro Cojo Slough*



*Cattle exclusion fence at the Calcagno parcel demonstrating restoration potential*

## Water Quality Monitoring

Water quality monitoring over the duration of the project showed that wetlands were effective in reducing nitrate concentrations, while the results for ammonia, phosphate and select pesticides varied.

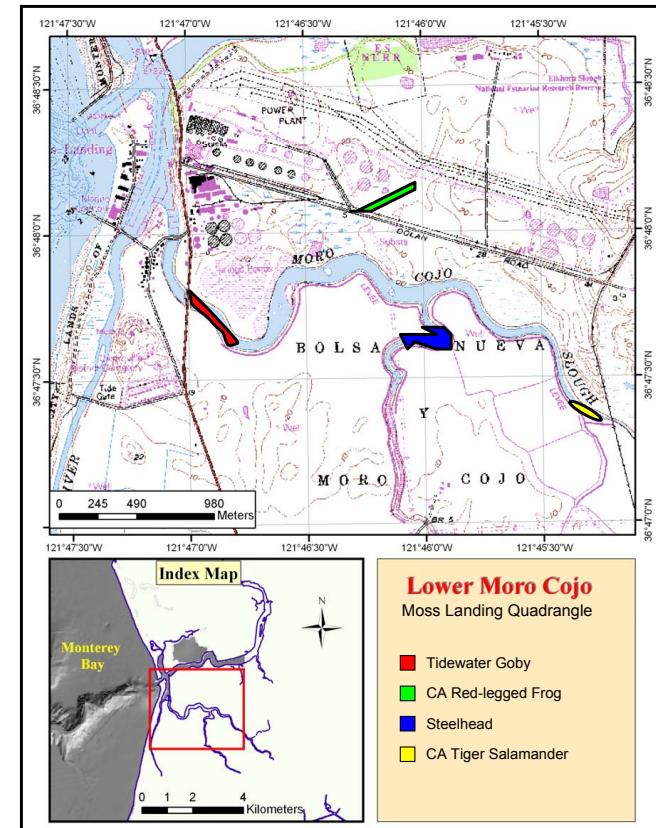


Nitrate Levels at 3 Sea Mist wetland locations. Site numbers increase downstream.

## Species Monitoring

Floral and Faunal surveys conducted throughout the project areas and watershed documented the presence of the following protected species: California red-legged frog, California tiger salamander, steelhead, Santa Cruz long-toed salamander, tidewater goby, and saline clover.

steelhead (right)  
tiger salamander larvae (below)



Locations of federally threatened and endangered species in the Moro Cojo Watershed

## Status

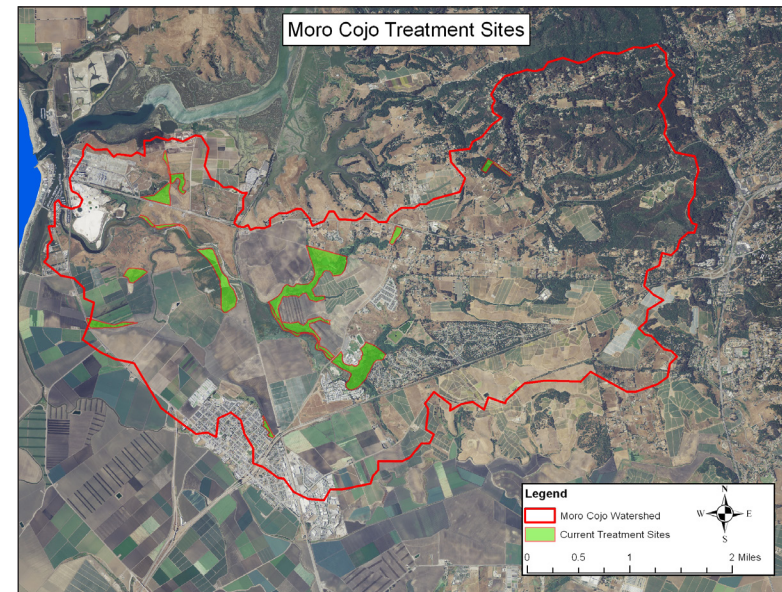
The Sea Mist Ponds continues to enhance the water quality for the lower slough and provide valuable freshwater habitat for resident and migratory waterfowl and endemic amphibians. The Central Coast Wetlands Group is currently planning upstream water quality treatment wetlands to reduce pollutant inputs into the Sea Mist Ponds.

## ONGOING RESTORATION AND ENHANCEMENT (2008-2013)

Funding for ongoing restoration and enhancement of sites around the Moro Cojo Slough was provided by the U.S. Environmental Protection agency (Region 9) starting in 2008. The project targeted the enhancement of the natural resource values of wetlands, floodplains, and adjacent upland habitats within the watershed for maximum biological resource values, particularly for special status species. A total of fifty acres of wetland and upland habitat at twelve sites throughout the watershed were restored and enhanced. The restoration has helped to mitigate anthropogenic impacts on wetland resources, particularly those that affect water quality, sedimentation, and loss of habitat.



*Restoration of a farm border adjacent to the upper Moro Cojo Slough*



*Sites where water quality and/or habitat enhancement projects have been installed since 1996.*

In addition to on-the-ground work, this project funded the development of restoration design plans for sites along the middle Moro Cojo and Castroville sloughs, Old Salinas River, and Tembladero Slough systems for inclusion in the Greater Monterey County Integrated Regional Water Management Plan. Specific plans supported through this effort include the restoration of back dune habitats along the Old Salinas River, construction of treatment wetlands throughout the Moro Cojo and Lower Salinas watersheds, and enhancement of the Tembladero Slough to provide needed improvements in flood conveyance, habitat and water quality.



*Dolan border site pre-restoration, 2009*



*Dolan border site post-restoration, 2012*



*Tembladero site pre-restoration, 2009*



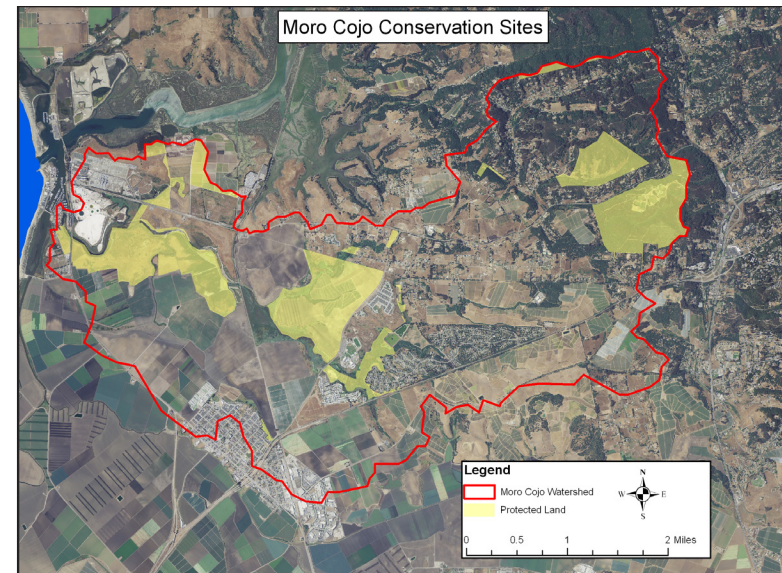
*Tembladero site post-restoration, 2012*

## CONSERVATION LANDS AND LANDOWNER AGREEMENTS (ONGOING)

The Elkhorn Slough Foundation (ESF) was formed in 1982 to support the work of the newly created Elkhorn Slough Reserve. Its early successes included the creation of the volunteer, education and research programs at the Reserve and opening and the enhancement of public access around the slough. Within a decade ESF took on a new role, when it began managing 800 acres of land owned by The Nature Conservancy. By the late 1990s ESF made the strategic decision to become a land trust with the explicit goal to acquire, protect, and manage lands around Elkhorn Slough.

ESF was involved with Phase I and Phase II Implementation Projects for the Moro Cojo Slough and owns the two large parcels on the south side of the main channel of the slough (Catellus and Sea Mist). Additionally, the organization has accepted numerous easements in the upper and lower watershed, some established as “offers to dedicate” by the Coastal Commission.

Future collaborative opportunities will focus on identifying restoration and management strategies for individual parcels under ownership or easement throughout the watershed.



*Land that is protected through conservation organization ownership or easements, or through landowner agreement.*



*Upper Moro Cojo Slough in easement held by ESF*

4.

## *Looking Towards the Future*

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*Upper Moro Cojo Slough*

## COLLABORATIVE APPROACHES

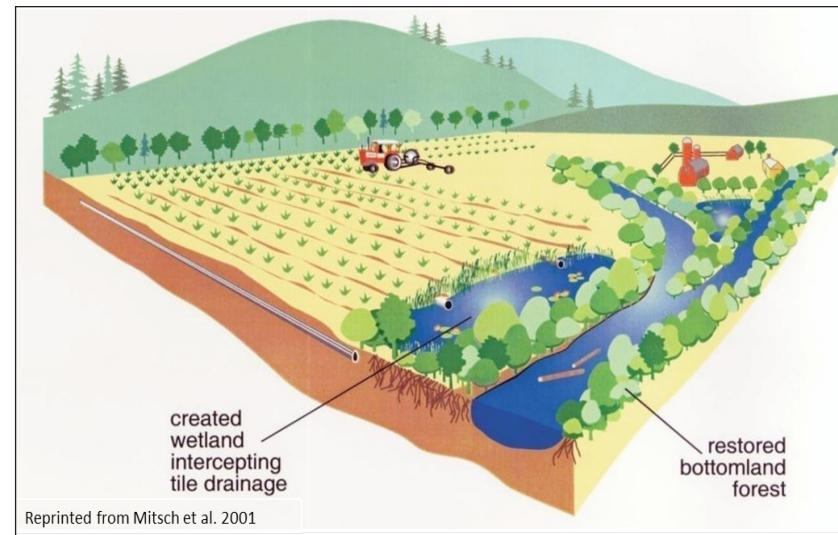
*"It is the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed."*

- Charles Darwin

Recent changes in the regulation of agricultural runoff combined with planning efforts by wetland scientists on the Central Coast may lead to new regulatory relief for farmers who support restoration activities. Efforts are underway to define a watershed approach to water quality solutions through implementing the following five objectives:

- Integrate on-farm practices with larger scale installation of treatment wetlands to treat ambient water quality.
- Improve data collection and compile results from multiple researchers and monitoring efforts to better quantify success.
- Provide a cost effective and strategic alternative to meet State water quality objectives.
- Spread program costs among multiple farmers and landowners and reduce administration costs.
- Address current and future TMDL requirements.

The success of current restoration efforts within the Moro Cojo watershed is the direct result of support from a diverse community that include farmers, geologist, hydrologists, biologists, chemists, teachers, State and Federal agency representatives, Monterey County officials, private landowners, and land conservancies.



*Schematic of on-farm treatment wetland*

### Moro Cojo Technical Advisory Committee

In 2005 a Technical Advisory Committee (TAC) was established to guide the implementation of the Moro Cojo Management and

Enhancement Plan, and met several times throughout Phase I and II of Implementation.

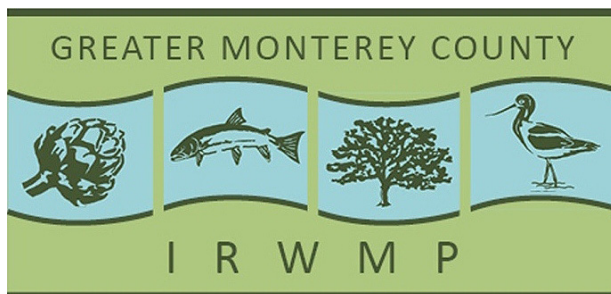
The TAC was convened again in 2012 where agency staff, researchers, and other stakeholders met to discuss the status of the implementation of the Moro Cojo Plan and identify priority next steps. 2012 TAC meeting participants included:

The Central Coast Wetlands Group, Elkhorn Slough Foundation, Elkhorn Slough National Estuarine Research Reserve, UCSC Reserve, USFWS, Big Sur Land Trust, Monterey RCD, Monterey County Water Resource Agency, State Coastal Conservancy, CSUMB, Ducks Unlimited, and Return of the Natives.

## Greater Monterey County IRWM Plan

Integrated Regional Water Management (IRWM) is a relatively new approach to water resource management in California. It is promoted by State water managers and legislators to increase regional self-sufficiency and water management planning. To be eligible for certain State grant funds, a project must fall within a region that has an IRWM Plan, and the project must be specifically listed in the plan. The Moro Cojo Slough and its related projects fall within the Greater Monterey County IRWM region, which includes the Salinas River watershed north of the San Luis Obispo County line.

The Regional Water Management Group is the entity tasked with developing and implementing the Integrated Regional Water Management (IRWM) Plan, reviewing projects submitted to the plan, and choosing which projects to put forward for funding. The Regional Water Management Group for the Greater Monterey County IRWM region includes government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests. The Central Coast Wetlands Group has been involved since 2007 as a group specifically focusing on the combined benefits of wetland restoration and water quality improvement throughout the Salinas Valley, including the Moro Cojo Slough.



Greater  
Monterey  
County  
IRWMP Logo

## Water Resource Project Coordination

The Regional Water Management Group received State Planning Grant funds to develop a process called “Water Resource Project Coordination” (WRPC), in the Gabilan watershed, which is adjacent to the Moro Cojo watershed. Benefits from this process are likely to be realized in both watersheds.



*As part of the WRPC process, stakeholders worked towards identifying common goals for the watershed*

The WRPC process is intended to create a forum for project coordination in an environment that is respectful, positive, and collaborative. At the center of this process is a core group of project proponents and stakeholders, led by a professional facilitator and assisted as needed by local experts. The process is based on a joint fact-finding approach where proponents and stakeholders come together to discuss the projects. Participants identify areas for project collaboration and expansion, potential conflicts, and mechanisms to resolve areas of disagreement.

## CHALLENGES IN THE WATERSHED

### Food Safety

The continued prosperity of Monterey County's \$4 billion agricultural industry is of critical importance for the region. Due to fears of outbreaks such as E. Coli and Salmonella, many large produce buyers have adopted stringent standards for the management of the fields where they source their produce. In some cases these standards conflict with agricultural management practices developed for water quality, habitat protection, and erosion control. This includes the retention of surface runoff or establishment of farm buffers, such as hedgerows and treatment wetlands that can provide habitat for wildlife. Growers report that they are increasingly caught in an impossible position, forced to choose between meeting mandates to improve water quality, or meeting food safety guidelines and contractual requirements. These concerns have led to recent restoration projects being removed, and to the reluctance of farmers to establish new conservation practices.

### The Ag Order

In March, 2012, the Central Coast Regional Water Quality Control Board adopted an updated Conditional Waiver of Waste Discharge Requirements (Agricultural Order No. RB3-2012-0011). The Order places farms in one of three tiers, based on risk to water quality. While the Ag Order does have language that supports treatment wetlands and other water quality enhancement practices for individual farms and multiple farm cooperatives, there remains confusion as to how regulatory "credit" is given to farmers that construct wetland treatment systems. This has led to hesitation among farmers and landowners in the Moro Cojo watershed to allowing new treatment projects to be constructed on their lands.

### Threatened and Endangered Species

A major concern of farmers is the regulatory implications of constructing treatment wetlands that may provide habitat for threatened and endangered species. Safe Harbor Agreements that protect farmers from additional regulatory liability associated with the Endangered Species Act is needed to ensure that on-farm and collaborative treatment wetlands can be constructed and maintained.



*California red-legged frog*

### Funding

Finding reliable long term funding to implement and maintain projects is always challenging. Competitive grant funding is not an ideal mechanism to support ongoing management of wetland resources in the Moro Cojo Slough. Thus far however, we have been successful in finding both the support we need and partners with whom to work. Establishing an endowment that supports the long- term restoration and maintenance of wetland and upland habitats is a high priority.

## FUTURE OPPORTUNITIES

Funding through the IRWMP to develop and permit additional treatment wetlands has been obtained. Funding from the State Water Resource Control Board to support an Irrigation and Nutrient Management Program will support efforts of the National Marine Sanctuary and the Resource Conservation District of Monterey County to fund next phase implementation projects. Sites have been identified where planning, permitting and implementation of treatment systems can be established.

### Next Steps Identified by Moro Cojo TAC

While some differences in management strategies among stakeholders remain unresolved, the TAC was able to prioritize a number of next steps towards implementing the Moro Cojo Management and Enhancement Plan. These include:

- Construction of new freshwater treatment wetlands within the Castroville Slough and Moro Cojo Slough drainage systems.
- Support public education, access, and links to the redevelopment of Castroville.
- Create threatened and endangered species management strategies.
- Continue and expand nutrient and pollution monitoring throughout the watershed.

### Future Projects

Based on comments from the 2012 TAC meeting, Greater Monterey County IRWMP partners have completed several project proposals and have submitted them as part of the IRWM Plan (2012). These include:

### Moro Cojo Phase III Implementation

This project will continue to address the goals of the Moro Cojo Slough Management and Enhancement Plan, the Northern Salinas Valley Watershed Restoration Plan, and the Central Coast Regional Toxic Hot Spot Cleanup Plan for Moss Landing Harbor. This project will involve the restoration of 120-acres of the Moro Cojo Slough containing tidal and brackish water marsh (a state marine reserve) that receive fresh water inputs from agricultural lands above. The result of this project will be to reestablish hydrologic connectivity and ecosystem function, enhance wildlife habitat, reestablish wetland habitat that supports endangered species (brackish water snail and tidewater goby), and improve water quality flowing out of the watershed into several State marine reserves and the Monterey Bay National Marine Sanctuary.

### Regional Water Monitoring Network

The Salinas Valley comprises a significant portion of the regions drainages and suffers severe water quality problems as identified through the 303d listing process. In response, significant resources are being directed towards improving agricultural irrigation and land management practices, and urban stormwater practices to restore surface water quality. This projects seeks to expand and maintain a water quality monitoring network with two primary components:

1. Real time water quality monitoring at key coastal confluence sites at the bottom of three watersheds. This will be done through taking over the management of two existing LOBO monitoring buoys and adding a third to measure hourly changes in various constituents of water quality.
2. Analysis of existing water quality data collected throughout the region necessary to define trends and quantify load reductions. This will be a follow-up to the 2008 SAM study and will lead to a better understanding of current water quality in the region.



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*Links to most reports can be found at <http://ccwg.mlml.calstate.edu/resources/documents>*

