



# **Lower Salinas Valley Managed Retreat Strategy**

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## 1. Introduction

This project is intended to integrate climate change resiliency objectives with management and enhancement of wildlife and aquatic habitats in the Lower Salinas Valley through the building of institutional capacity and planning for the implementation of creek, floodplain, and wetland restoration projects that:

1. Revitalize coastal wetlands, creeks, and rivers and restore natural watershed processes
2. Provide migratory corridors for wildlife (fish and amphibians) through areas of intense agricultural activity in the Lower Salinas Valley
3. Link downstream habitats (Elkhorn Slough, Moro Cojo Slough, and Salinas River Lagoon) with upstream enhancement habitats (Carr Lake) through the restoration of flood-vulnerable areas including agriculture ditches and floodways
4. Achieve these environmental objectives while increasing the resiliency of adjacent agricultural lands

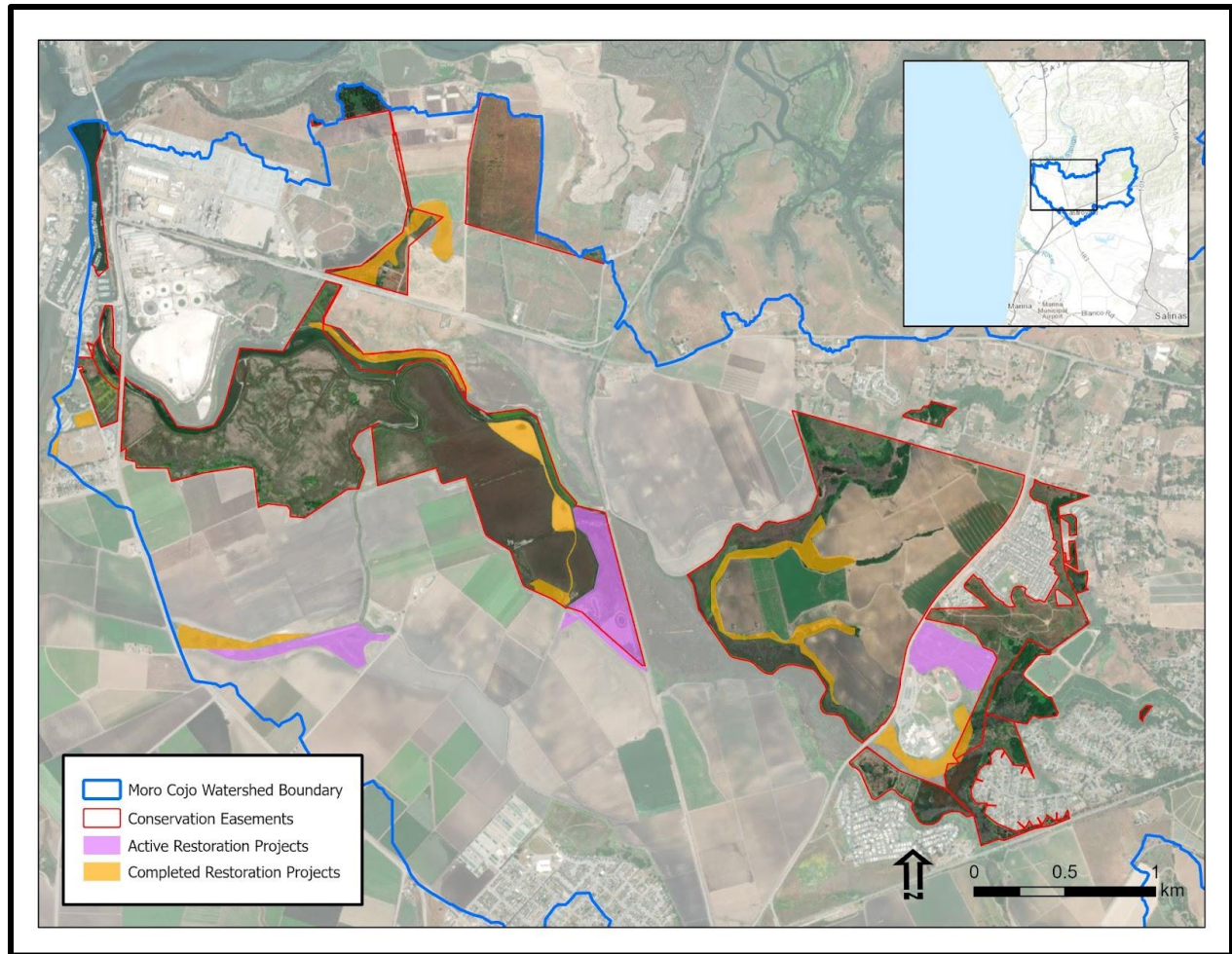
Over the past century, most of the natural wetland and creek habitat in the lower Salinas Valley has been lost to reclamation for urban development and agricultural production. The natural waterways that once spanned much of the Salinas Valley provided natural flood resilience to adjacent uplands are now at risk from the combined hazards of sea level rise (SLR), increased fluvial discharges, and coastal wave induced flooding. Recent modeling exercises suggest that more than 8,000 acres of agricultural land within the lower Salinas Valley are now in jeopardy of extensive seasonal flood damage, with localized rainfall in the Gabilan Hills already leading to \$2 million in crop losses in 2014<sup>1</sup>. The Moss Landing Community Sea Level Rise Vulnerability Report found flooding risks currently extend east into portions of Castroville and agricultural lands along the Old Salinas River Channel and Tembladero Slough.

To plan for implementation of the desired projects to improve climate adaptation and resilience, the Central Coast Wetlands Group (CCWG) and Coastal Conservation and Research (CCR) have worked with local landowners, municipalities, and resource management agencies to identify opportunities to acquire and restore portions of these former floodways. Restoration activities in the Moro Cojo Slough watershed over the past 30 years have already demonstrated increases in climate resiliency. Within the Moro Cojo watershed, CCR and CCWG have worked with landowners to restore over 100 acres of former farmland to freshwater and brackish water habitats. Through these conservation and restoration efforts, a habitat transition zone has been created along much of the Moro Cojo slough between the active farming operation and the wetland habitat. This transition zone allows for habitat migration because of SLR. Examples of documented success include the recruitment of red-legged frogs and the enhancement of migratory pathways for birds through the Slough and along the coastal flyway.

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<sup>1</sup> Moss Landing Community Coastal Climate Change Vulnerability Report, CCWG, 2017

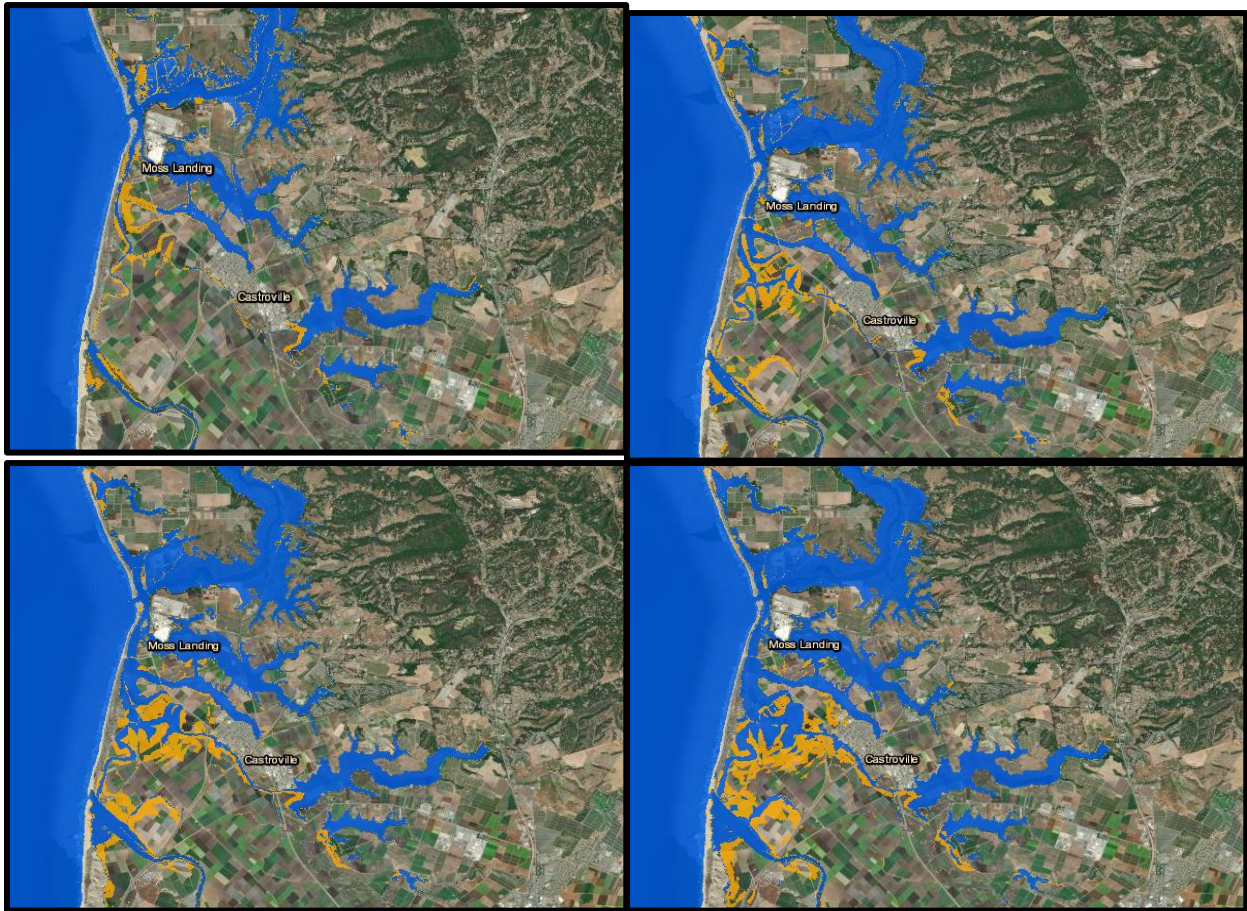




**Figure 1.** The Moro Cojo Watershed Restoration area, labeled with the watershed boundary (blue), conservation areas (red), active restoration projects (magenta), and completed restoration projects (orange).

Considerable progress has been made in the Moro Cojo Slough to enhance the climate resiliency of farming operations and local habitats. Using the skills and knowledge obtained through projects in the Moro Cojo Slough watershed, progress can be made in developing climate resiliency in the nearby lower Salinas Valley (Tembladero Slough/Reclamation Ditch and Old Salinas River Channel). The lower Salinas Valley has remained farmland solely using pumps and tide gates to discharge ground and flood waters, but even with this infrastructure this region remains vulnerable to flooding, SLR, and changes in annual rainfall. Local climate models<sup>2</sup> predict stressed agriculture along the Tembladero and Old Salinas River drainage ways, frequent flooding during winter months due to rain events and storm surge, and reductions in summer low flows in the future. With little success documented to date in this region, the restoration of wetland and slough ecosystems in this area will be pivotal to its future climate resiliency.

<sup>2</sup> Storm Water Resource Plan, Greater Monterey County Integrated Regional Water Management Region, 2019



**Figure 2.** NOAA SLR projections (NOAA Sea Level Rise Viewer<sup>3</sup>) for the Salinas Valley, ranging from normal mean high water (MHHW) (top left) all the way to 5 ft above MHHW (bottom right). Blue marks areas of high confidence for flooding, while orange marks areas of low confidence of flooding.

Recent changes in the functionality of local water infrastructure (due to early impacts of climate change) have reduced the farming viability in some of these vulnerable areas, creating an opportunity for reclamation of historical wetland habitat. As recent as 2017, farmers have sought help from the County to resolve flooding problems during winter storms along the Tembladero Slough/Reclamation Ditch and Old Salinas River Channel. Flood modeling and planning have determined that it would be cost prohibitive to eliminate the risk of flooding in vulnerable areas near drainage systems through construction of additional infrastructure<sup>1</sup>. Facing the limitations of County engineering and associated land recovery costs, farmers are looking to partner with CCWG and other organizations to transition these land parcels to other uses including flood reduction and water quality enhancement.

<sup>3</sup> Sea Level Rise Viewer, Office for Coastal Management – NOAA, <https://coast.noaa.gov/digitalcoast/tools/slr.html>



CCWG and the Greater Monterey County Stormwater Resources Plan development team created a watershed enhancement prioritization model to guide the selection of lands for wetland, creek, and riparian restoration projects. Specifically, the model selects for projects that:

1. Improve aquatic habitat and water quality for native species
2. Support flood attenuation and stormwater capture
3. Occur on lands that pose problems to successful farming
4. Provide open space and recreational opportunities for disadvantaged communities (DACs)

In addition, recent studies (CCWG 2017, IRWMP 2018) recommended specific climate change adaptive management strategies be developed through this project:

- **Establish managed retreat policies to support future adaptation.**

Managed retreat is an adaptation strategy aimed to facilitate and regulate the gradual move away from areas vulnerable to flooding or erosion. Managed retreat programs can work in tandem with other adaptation strategies to reduce impacts of flooding, maintain local character, improve natural habitat areas, and secure coastal access.

New zoning or additional policies are needed for local managed retreat policies to allow relocation of development within areas of risk. For agricultural lands, policies are needed that allow for wells, water supply systems and other infrastructure (including water use allocations) to be relocated into new areas.

- **Improve flood attenuation through creek and wetland restoration.**

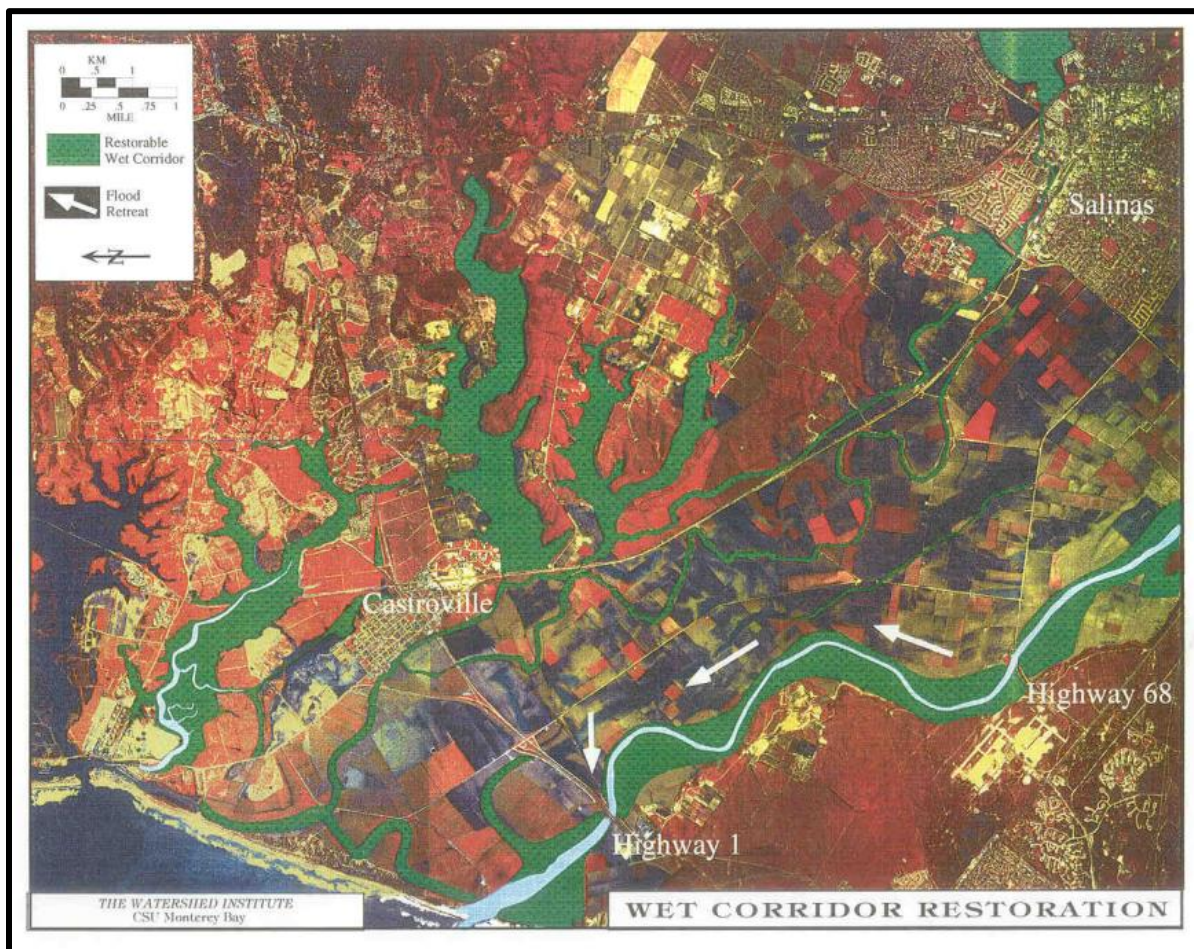
Wetlands can act as a critical buffer from waves, tides, and erosion, and will provide a resilient transition landscape if they are given the space to do so. Additionally, wetlands provide natural pollution filtration and shoreline stability, sequester carbon, attenuate flood waters, and provide critical habitat that supports local fishing, tourism, and threatened wildlife.

## 2. Previous Restoration & Planning Efforts

Agriculture and urban development have heavily impacted the Salinas River and its surrounding watersheds. Thousands of acres of natural wetlands have been filled and ditched over time, reducing water quality, flood protection, and groundwater recharge. While saltwater intrusion and nonpoint source pollution have increased over time, wetland restoration actions were designed to resolve these issues and improve overall climate resiliency in the lower Salinas Valley. Efforts to restore aquatic habitat and natural watershed processes within the Salinas Valley have established many of the necessary programs to increase resiliency of flood prone agriculture lands due to climate change.

### **The Northern Salinas Valley Watershed Restoration Plan (1997)**

Restoration planning in the lower Salinas Valley began in 1995 with the Northern Salinas Valley Watershed Restoration plan<sup>4</sup>. As part of the planning effort, historic creeks, sloughs, and lakes in the Salinas Valley were overlaid on the current landscape to indicate points of interest for restoration. The comparison documented a significant area of wetland and riparian corridor habitat lost to land development. The Plan utilized this information to identify specific areas for aquatic habitat restoration within urban, commercial, agricultural development, and along river levies, and highly modified drainage systems. The plan directed restoration efforts and activities to restore wetland areas with high flooding potential and to keep future urban development away from these lands.



**Figure 3.** From the 1997 Northern Salinas Valley Watershed Restoration Plan – targeted sites for future restoration. Identification of all possible restorable drainage areas of the Salinas Valley not impacted by permanent land use practices (roads, housing development, etc.).

<sup>4</sup> Comprehensive Watershed Management Solutions to Nonpoint Source Pollution in the Salinas Valley & Pajaro River Basin, State Water Resources Control Board – 319h Grant Final Report, 1997



### **Watershed Institute – Final Report, EPA Agreement No. C6999214-95-0 (1997)**

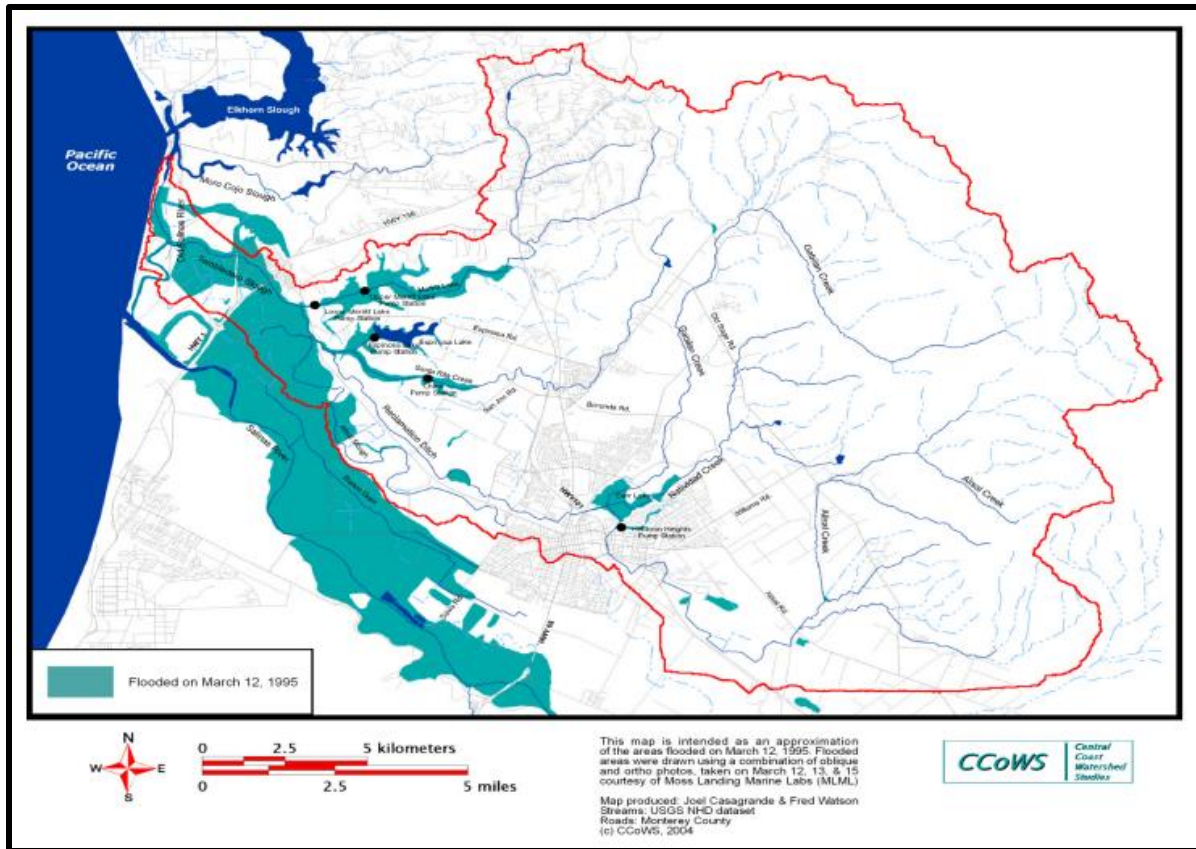
In recognition that private land must be acquired for wet corridors and other wetland and habitat restoration efforts to be established in this area, this project developed a process to gain landowner trust, buy-in, and eventually the creation of new landowner agreements to sell conservation easements. A signed easement ensuring permanent conservation of wetland areas was the ideal outcome, but at the time of the Watershed Institute's Final Report for Comprehensive Management Solutions to Nonpoint Source Pollution in the Salinas Valley & Pajaro River Basin, it was understood that this outcome would take some time to fully materialize. To achieve these goals, positive incentives and good faith agreements were, and still are, commonly tools used.

### **Monterey County Water Resources Agency – Reclamation Ditch Watershed Assessment (2005)**

Due to increased flood impacts along the Reclamation Ditch flood channel, this project was initiated to assess the 157 square-mile Gabilan watershed in the lower Salinas Valley. The study documented that over time, the Gabilan watershed has dramatically changed from natural grassland and woodland landscapes flowing into vast wetland marshes and lakes to being dominated by agricultural and urban land parcels and channelized waterways. The intended purpose for the construction of the Reclamation Ditch in 1908 was to facilitate land reclamation for agricultural expansion. Since its construction the watershed it drains has increased the amount of impervious surfaces (city of Salinas and vast nursery and plastic lined agriculture), has led to the system failing to provide the necessary flood control. Decisions by the County Board of Supervisors to not invest vast amounts of funding to line the 13-mile reclamation ditch with concrete reduced further degradation of the watershed but left the region vulnerable to periodic flooding.

### **Monterey County Water Resources Agency – Reclamation Ditch Watershed Management Strategy (2005)**

The goal of Part B of the Reclamation Ditch Watershed Assessment was to develop a watershed-wide, community-based management strategy for the Gabilan watershed. Management goals for the watershed were set (i.e., water quality, flood control, harbor sedimentation) and were consolidated to three Working Groups that focused on actions concerning Flooding, Natural Resources, and Economic Viability. This management strategy marks the first time the Gabilan watershed had been recognized and described as a 'watershed,' elevating the planning and management focus from one of solely flood control to one recognizing the other functions a watershed needs to provide and strategies to reestablish them. This document notes several risks that can hinder the success of this management plan: availability of funding (limited municipal funding, agricultural source control practices), land availability (reacquisition of land currently being used for agricultural and urban uses), and changes in water quality policy and law (i.e., changes in the SWRCB policy on non-point source requirement like the Ag Waiver, or the weakening of State or Federal water quality laws). Stakeholders that participated in the drafting of this document have continued working to develop the governance, programs, policies and guidance needed to restore the watershed processes of the Gabilan Watershed and achieve the needed flood resiliency that is now being intensified due to climate change.



**Figure 4.** From the 2005 MCWRA Reclamation Ditch Watershed Assessment – flooded areas (light blue) of the Northern Salinas Valley and Reclamation Ditch Watershed at the peak of the March 12, 1995 flood.

### [Greater Monterey County IRWM Plan \(2018\)](#)

Promoted heavily by the state of California, the integrated regional water management (IRWM) protocol is a regional-oriented approach to water resource management to increase self-sufficiency. Establishing the Greater Monterey County IRWM is an attempt by vested stakeholders to establish the multi-partner organizational structures, called for in the IRWMP state guidance, to establish management strategies for the lower Salinas Valley Reclamation Ditch (expanded upon in the 2005 Reclamation Ditch Watershed Assessment summarized above) and received focused state grant funding to implement projects within the strategy. The Greater Monterey County IRWM Plan brings together water and natural resource managers, and other community stakeholders in Monterey County to collaborate on objectives to ensure the region's continued water supply reliability, improved water quality, flood management, and healthy watershed and ecosystems functions. IRWM strives to establish an institutional framework that brings the vast numbers of stakeholders together in the face of future uncertainty (particularly considering climate change) to solve watershed and water resource challenges in Monterey County.

### [IRWMP Storm Water Resource Plan \(2019\)](#)

Greater Monterey County Integrated Regional Water Management Program (IRWMP) Storm Water Resource Plan (SWRP) was drafted to document how a variety of hypothetical storm

water management projects could provide regionally optimized benefits of increased water supply, improved water quality, superior flood protection, enhanced environmental quality, and greater community opportunity. Many of the projects described in this SWRP are focused on the reestablishment of natural drainage systems, restoration of wetland and riverside habitats, and the creation of floodplain parkways to reduce the impacts of storm water flooding and enhance water resource reliability.



**Figure 5.** From the 2019 IRWMP Storm Water Resource Plan – predicted 10-year inundation levels in the lower Salinas Valley in a mitigated scenario (light blue) from the cumulative projects and an unmitigated scenario (dark blue) with current conditions.

### [Moss Landing Harbor AB691 Sea Level Rise Assessment \(2019\)](#)

Infrastructure in the Moss Landing Harbor District is subject to future hazards from SLR and coastal flooding. The SLR assessment of Moss Landing provides a blueprint for adapting harbor infrastructure to meet coastal resiliency standards for continued harbor operations through 2060. This report stresses the importance of all parties (Monterey County, Caltrans, regional utilities, California State Parks, private landowners, etc.) to be engaged in road, bridge, and tide gate infrastructure maintenance and upgrades.

### [Central Coast Agriculture Waste Discharge Order, version 4.0 \(2021\)](#)

Discharges associated with agricultural production of the central coast have impaired the quality and accessibility of drinking water, surface water, and riparian habitat beneficial uses. The



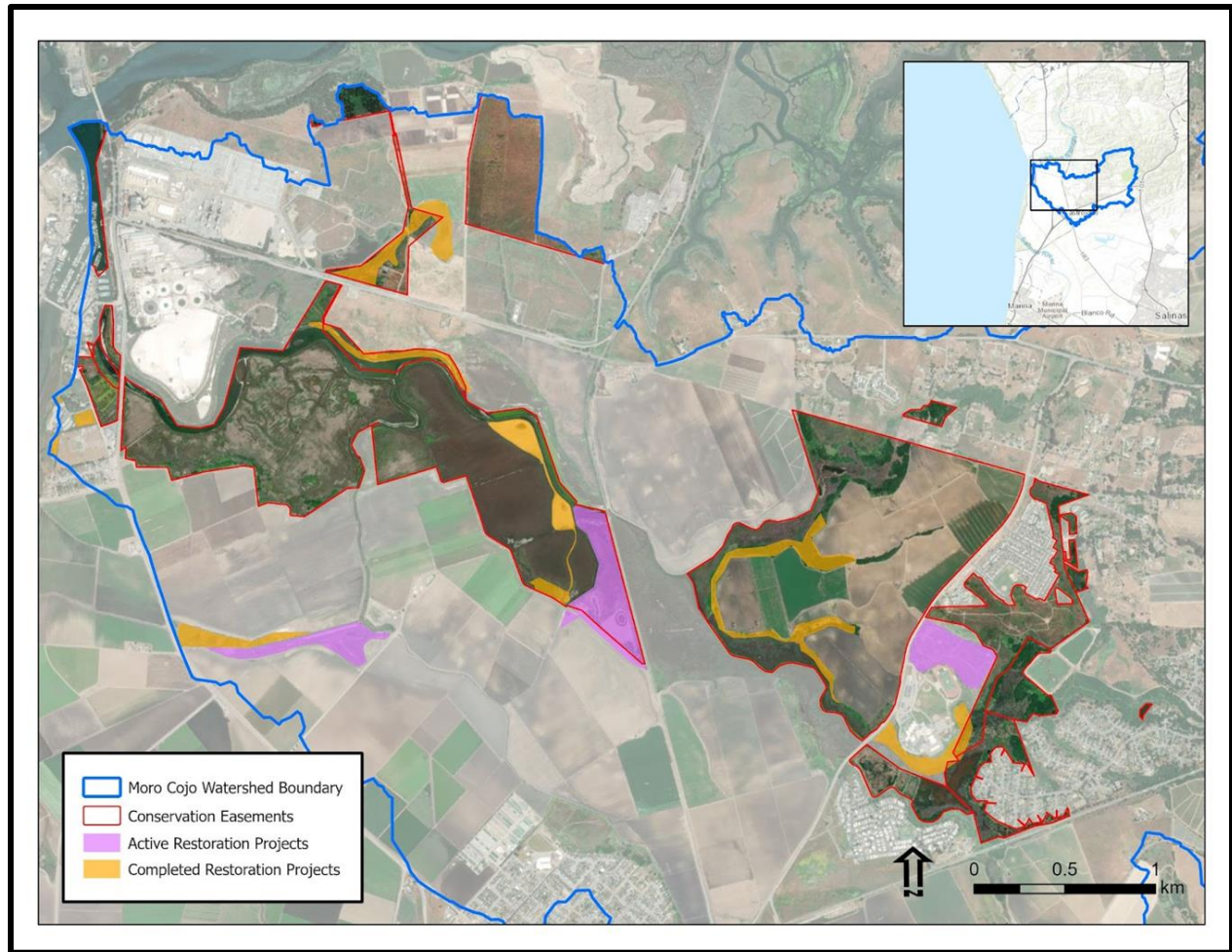
General Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R3-2021-0040), also known as Ag Order 4.0, was issued by the Central Coast Regional Water Board (Regional Board) to address these issues. Growers and technical service providers who are members of the Ag Order 4.0 third-party compliance assistance program, administered by Central Coast Water Quality Preservation, Inc. (Preservation, Inc.), receive resources to assist with regulatory compliance. One service available to growers who are members of the third-party compliance program is the Surface Water Follow-Up Program which offers a Regional Board approved alternative pathway to achieving compliance with Ag Order 4.0 surface water quality objectives for growers located in areas with particularly poor water quality. CCWG is a technical advisor for developing the Surface Water Follow-Up Program and is working to include a watershed cooperative model for alternative compliance. The watershed cooperative model would mean all members in a sub-watershed receive credit for compliance if their surface water drainage is sufficiently treated at a collective downstream treatment wetland. This model was successfully implemented in the Moro Cojo Slough watershed and CCWG is in discussion with the Regional Board and Preservation, Inc. on how to replicate these results in the lower Salinas Valley watershed.

### **Salinas River State Beach Dune Restoration and Management Plan (2021)**

Approximately 280 acres of coastal beach and dunes along the Salinas River State Beach provide a natural barrier between ocean wave impacts (waves, flooding, future effects of SLR) and the estuarine habitat and productive agriculture fields in the lower Salinas Valley. Dune restoration efforts have been focused on the removal of ice plant that undermine the dynamic structure of dune form and function and limit the capacity to be resilient to the effects of SLR and storm waves. Native plantings are being installed to enhance biodiversity and dune function.

### **Moro Cojo Slough Management and Enhancement Plan Status Review (2023)**

The Moro Cojo Slough Management and Enhancement Plan (1996 Management Plan) was drafted in 1996 to drive restoration efforts within the estuary and watershed, protect threatened species, and manage the estuarine and freshwater resources in harmony with adjacent land uses. CCWG staff at Moss Landing Marine Labs, in collaboration with Coastal Conservation and Research (CC&R), and Elkhorn Slough Foundation (ESF) have led efforts to implement the 1996 Management Plan since its drafting. The 2023 Status Review document compiles information from the numerous reports and datasets generated as part of previous implementation projects (Figure 6), documents progress towards meeting the goals of the 1996 Management Plan and aids the prioritization of future goals and management actions.



**Figure 6.** Lands acquired from farmers for floodplain and wetland restoration, most of which have become too wet to farm.

### 3. Where Do We Go From Here?

Wetland resource management and coastal climate resiliency have until recently been addressed as separate issues. California resource managers and state agency staff have been working to integrate these two resource management objectives together where possible. For the Lower Salinas Valley, our efforts to develop integrated wetland restoration, water resource management, coastal resiliency, and flood adaptation policies and programs have identified a set of aquatic resource enhancement opportunities, several challenges to implementation, and potential strategies that could be implemented to address these challenges.

The implementation of the Moro Cojo Slough Management and Enhancement Plan has been a successful effort of unmanaged retreat. CCWG and partners have worked to acquire access to low lying portions of agriculture fields that are too wet to farm and transition those lands back to flood plain and habitat. Each of the successful projects implemented in the Moro Cojo Slough watershed struggled to surpass several challenges that delayed progress. By drafting this Salinas Valley Managed Retreat Strategy, we hope to establish common practices and an institutional

framework needed to implement the reestablishment of watershed processes within flood prone areas that will become less viable for farming in the face of SLR.

Successful strategies employed in the Moro Cojo that can be expanded to the entire Lower Salinas Valley include:

**1. Prioritize the acquisition of portions of agricultural lands that are vulnerable to flooding or “too wet to farm”.**

Most land trust conservation easement and land acquisition efforts have focused on the acquisition of entire parcels of land from growers, with portions of those lands transitioned to habitat while other portions remain in agriculture, providing revenue to the land trusts. Success in the Moro Cojo Slough watershed (an initial focal area of the Lower Salinas Valley) took a different approach. CCWG, CCR, and Elkhorn Slough Foundation (ESF) have worked with landowners to purchase portions of agricultural parcels that are most vulnerable to flooding and SLR, while the less vulnerable portions of parcels remain owned and farmed by the growers. More than 140 acres of agricultural lands have been transferred from active farmlands to conservation and restoration using this strategy. This strategy has addressed the landowner’s objective of retaining ownership of income generating lands (leased to growing operations) while transferring ownership (through lot line adjustment or conservation easement) of the most vulnerable portions of the lands.

This strategy also expands the utility of state acquisition funding. By purchasing only the flood prone portion of an agricultural parcel (normally less than 10%) that also provides the greatest flood resiliency and aquatic habitat restoration potential, acquisition funds can effectively acquire far more of these flood prone lands.

**2. Support SLR resiliency through development of multi-benefit restoration projects.**

Once portions of lands are acquired, it is important to complete the improvements needed to achieve the environmental objectives identified for those lands. Landform changes to increase flood resiliency can be accomplished by increasing flow capacity of channels within agriculture areas, by moving active agricultural lands away from active flood areas, and by redistributing soils onto adjacent lands to reduce flood potential of those areas. Such flow capacity projects are best implemented within a drainage basin where upstream flood reduction and downstream flow restrictions are addressed in tandem with setback efforts.

As will be discussed in the case study section below, project designs that add additional resiliency and environmental benefits help make the adaptation projects more attractive to landowners and funding agencies. Additional benefits that can be included in these resiliency projects include:

- **Water Quality Enhancements:** Many farmland transfer projects within the adjacent Moro Cojo watershed have included the construction of water quality treatment systems (vegetated buffers, treatment wetlands, and bioreactors) that help reduce pollutant loading to downstream receiving waters. Developing these



projects as part of the Central Coast Water Quality Preservation, Inc. led Surface Water Follow Up Program, aimed at compliance with the Ag Order 4.0, will provide the growers and landowners with regulatory compliance for those ranches, reducing compliance costs to growers and increasing the property value of compliant ranches.

- **Aquatic Habitat Setbacks:** Moving agricultural operations away from waterways is becoming more common as food safety requirements become more stringent. Food safety requirements often restrict the use of flooded areas for a period of time. Use restrictions can limit farming operations for a year or more on flooded lands.

Currently the Ag Order 4.0 does not require buffers between agricultural operations and waterways, however future policy goals do include requirements to vegetate (or restore) drainage channel edges to reduce erosion and improve water quality and habitat. If designed properly and integrated into Ag Order compliance strategies, these flood resiliency setback areas can provide beneficial environmental services.

- **Endangered Species Support:** There are several endangered species recovery goals and strategies that exist within the Salinas Valley that can be integrated into the implementation of these floodway setback areas. Habitat creation and restoration for aquatic species including Steelhead, tidewater gobies, red-legged frogs, and Santa Cruz long-toed salamanders could be supported through habitat restoration activities within flood resiliency setback areas. Integration of these species enhancement goals can provide restoration funding opportunities as well as potential mitigation needs for other floodway management activities. Within the Lower Salinas Valley, U.S. Fish and Wildlife Service (USFWS) has noted that flood resiliency setback areas may provide off channel habitat for various species of concern that will enable Monterey County to modify Salinas River mouth management guidelines in ways that help reduce flooding of adjacent farmlands. Potential conflicts between ongoing agriculture operations and the expansion of endangered species distribution will need to be addressed through regulatory procedures (safe harbor agreements or other effective strategies). Dialog with regulatory agencies is underway to establish these protections.
- **Groundwater Recharge and Irrigation Curtailment:** With the adoption of the Sustainable Groundwater Management Act (SGMA)(AB 1739, SB 1168, SB 1319) in 2014, growers that use groundwater are engaged in a process led by the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) to draft strategies to ensure that groundwater resources are not overused in the future. One strategy to reduce groundwater overdraft is to reduce groundwater pumping which may require a reduction in irrigated acres. By working with growers of flood prone lands to return portions of their irrigated lands to floodplain and habitat, a reduction in acres of irrigated crops will occur through a farmer led

process. Additional groundwater benefits can be achieved if floodplain restoration occurs in areas with permeable soils that will encourage greater groundwater infiltration.

## 4. Challenges in the Lower Salinas Valley

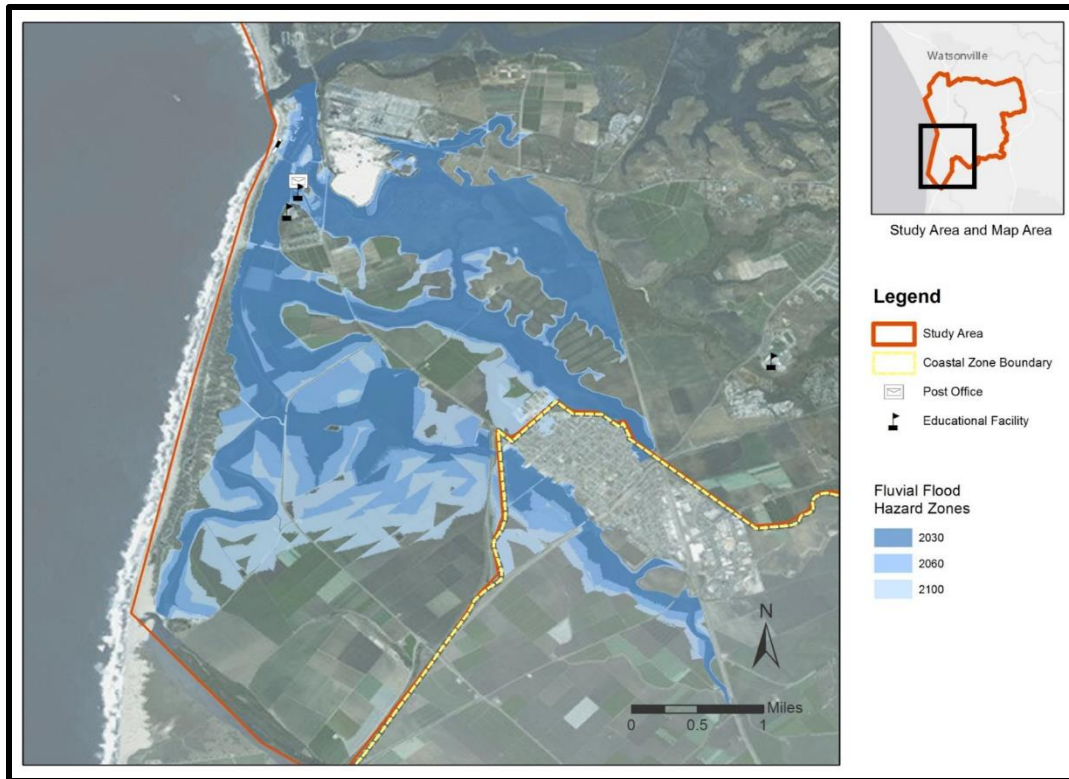
While the strategies described above have been successfully implemented within areas of the Salinas Valley and provide examples for how to achieve climate resilience, there are several challenges to implementing these strategies more broadly and systematically throughout the Valley. Local climate modeling has identified several future hazards that make stakeholders and landowners more vulnerable to climate related impacts, including coastal flooding, wave impacts, groundwater depletion, saltwater intrusion, drought and flooding. This project is supporting adaptation planning to aid farmers to become more resilient to flooding. As the team focuses more closely on strategies to aid adaptive capacity of farmers, the integrated nature of watershed management becomes apparent. The following are the challenges facing the Lower Salinas Valley in securing climate resiliency in the region:

**Challenge 1: The temporal nature of flooding and future uncertainty in the risks associated with flooding events.** Historical flood risks to coastal communities on the central coast have been well documented including the 1982 and 1998 El Niño events<sup>5</sup> and the 1995 flood, and the hat significantly impacted Moss Landing Harbor and the low-lying farmlands of the Salinas Valley. While it is understood that future flood risks are expected to increase due to the combined effects of rising seas and changes in rainfall leading to an increase in winter stream flows, uncertainty regarding the increased flood risk for specific properties still exists. CCWG assessed SLR vulnerability in the lower Salinas Valley using hazard layers developed by ESA in 2014, with some modifications through 2016, and produced hazard layers for 2030, 2060, and 2100 (Figure 3). The SLR vulnerability assessment and hazard layers that were developed provide information regarding local flood risks in the lower Salinas Valley but cannot address the uncertainty that exists on a fine scale since it is understood that modeling coastal processes is not conclusive. Each modeled coastal process will impact various coastal resources and structures differently, and analyses of different scenarios will produce different flooding projections. This uncertainty often leads to a saliency challenge when communicating with agricultural landowners about flood risks associated with climate change. The frequency of flooding to a given parcel cannot be definitively known and increases in flooding risk occurs on a relatively long-time scale compared to agricultural production schedules. These temporal lags lead to growers and landowners discounting the future vulnerability of a field to flooding in favor of the possibility of keeping it in production.

For some lands, routine flooding already occurs, and these lands are most likely to be acquired for water resource enhancement. Questions remain as to how such periodic flooding will affect appraisal values. Examples within the Moro Cojo watershed demonstrate that land valuation declines as flood frequency increases.

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<sup>5</sup> AB 691 Sea-Level Rise Assessment – Moss Landing Harbor, Central Coast Wetlands Group, 2019



**Figure 7.** Fluvial flood hazard layers in the lower Salinas Valley for benchmark years in 2030 (dark blue), 2060 (blue), and 2100 (light blue).

### **Challenge 2: Appraisal and acquisition of farmland from private owners.**

Adequate compensation will need to be provided to private landowners in order to acquire farmland that is at a high risk of flooding. While there are landowners interested in engaging in discussions about selling easements on their land for the purpose of implementing floodplain and wetland restorations, these landowners are hesitant to sign any written agreements to sell these linear portions of ranches prior to understanding the full financial, regulatory and operational implications of the transaction. To be most successful in land access negotiations, the flood resiliency program needs fiscal resources with which to negotiate land acquisition deals (including land appraisals). Currently most federal and state agency grant funding programs require signed landowner agreement prior to awarding funds to complete easement acquisitions, leading to a ‘chicken and egg’ acquisition challenge. Having access to acquisition funding is critical to initiating land acquisition negotiations. Prior to having identified funding, negotiations are hypothetical and insufficient to support negotiations for lands that are still producing.

### **Challenge 3: Regulatory conflicts with the implementation of adaptive actions.**

Adaptive actions taken in the lower Salinas Valley face many permitting hurdles prior to their construction. The State of California and other regulatory bodies have implemented strict criteria for projects that alter rivers channels and banks, wetlands, and other aquatic habitat types. Projects are often hindered by overlapping and sometimes conflicting regulations. For example, California Clean Water Act Section 401 and California



Department of Fish and Wildlife (CDFW) Section 1600; both regulations have requirements for altering (filling, dredging, excavation, etc.) waterways and blue line streams but are focused on different environmental protections (hydrographic stability versus species impact). Other regulatory challenges include liability challenges with the Endangered Species Act (ESA), water quality risks associated with constructing water quality treatment systems and restrictions on construction in floodplains of projects intended to increase flood resiliency .

In addition to challenges with permitting construction activities, creating habitat for threatened and endangered species can increase regulatory risks for farmers for impacts of successful increases in species densities leading to impacts (takings) on these species through regular farming activities. While discussions with state and federal agencies responsible for protection of threatened species, to date participating growers have allowed projects to move forward with uncertain implications to future production if special status species recruit to these habitats.

To ensure that these climate driven floodplain setback projects achieve the environmental goals defined for that project, periodic maintenance (sediment and flow management) and vegetation management (removal of invasive species and native species that can reduce flow) is necessary. Common construction permit practices include the drafting of a project management plan that outlines the need to conduct periodic maintenance that may include weeding, earth moving, sediment removal etc. To date these management plans have successfully been used to complete maintenance activities but future risks of stream and wetland protection regulatory restrictions are uncertain.

**Challenge 4: Defined agency partners responsible for long term management of constructed coastal resiliency projects in the lower Salinas Valley are needed and cross jurisdictional watershed management programs established to ensure projects function together to reduce watershed scale flood risks.**

As recognized within the [Reclamation Ditch Watershed Management Strategy](#) an administrative and operational agency is needed to provide long term oversight of floodplain enhancement activities in the lower Salinas Valley. There are numerous management and logistic concerns that need to be addressed by a designated agency or district, including invasive species management, maintenance of systems (i.e., broken pumps, excessive sediment), trash cleanup and access management, and security (i.e. managing trespassing, homeless encampments, litter, habitat disruption, etc.). Additional funding to the responsible agencies is needed to support these operations and maintenance needs.

Possible agencies to provide these services may include Monterey County Water Resources Agency, North Monterey County Parks District, Monterey One Water, Castroville Services District, and California State Parks.

The Greater Monterey County Regional Water Management Group (RWMG) has played an unofficial role supporting regional planning for water resources within the county by engaging these and other agencies and stakeholders in the coordinated management of water resources. However, the RWMG currently only provides regional coordination

support and acts as a conduit for state funding via IRWMP grants. Watershed scale management of surface waters remains highly unorganized and underfunded.

## 5. Action Items to Address the Challenges Faced in the Lower Salinas Valley

To address the challenges to climate resiliency in the lower Salinas Valley listed above, the following actions are being taken to improve upon the methods and tools already in place:

### **Action 1 - Building Relationships with Landowners to Engage in Flood Prevention Discussions.**

CCWG has used SLR, and HEC-RAS fluvial models provided by Environmental Science Associates for coastal inundation in 2030, 2060, and 2100 (see Figure 6) in the lower Salinas Valley to document future flooding risks. Predicting localized impacts to specific land parcels, however, is much more difficult. Speaking with farmers and landowners about their on the ground experiences is often an excellent way to initiate discussions regarding localized flooding impacts that could be addressed through larger floodway planning. Until recently, conversations between landowners and organizations like CCWG have been limited and sometimes difficult to initiate because growers are focused on addressing current flooding. CCWG strives to create and maintain meaningful relationships with landowners, building a network of growers that can help document new and long-term flooding challenges in the region. Ongoing dialog with growers regarding water related challenges is likely to help document when a grower may be interested in making changes that help reduce flooding and setting the stage to begin new negotiations to acquire flood prone land from landowners.

Additionally, CCWG will focus on identifying and working with farmers who are interested in taking preemptive actions to retire and repurpose lands that currently flood infrequently but are anticipated to flood more often in the future. Successful setback projects with these interested landowners can be used to demonstrate how flood planning and taking early action can be financially beneficial to the landowner. Primary benefits include reducing the need for future investments in expensive flood management infrastructure (levees and drainage systems), as well as ensuring that the land is appraised as high value cropland rather than low value flood land.

### **Action 2 - Develop and Secure a Funding Apparatus for Land Acquisition and System Management using State and Local Funding Opportunities.**

#### State Funding Opportunities

State funding available for land acquisition comes with program specific requirements, restrictions and limitations. We have found that to successfully develop landowner agreements and acquire lands for flood resilience, it is important to have an established funding mechanism in place from which to initiate negotiations, demonstrate a financial commitment and document funding parameters (appraisal restrictions etc.). In addition, having committed partners and programs in place that can aid

negotiations regarding regulatory compliance benefits and operational commitments of managed retreat programs will help to codify secondary benefits that can be attributed to the project and grower.

To address these needs, CCWG applied for and successfully obtained funding from the California Department of Conservation's Multi-Benefit Land Repurposing Program (MLRP) in partnership with California Marine Sanctuary Foundation and Salinas Valley Basin Groundwater Sustainability Agency. In May 2022 CCWG and its partners were awarded \$10 million to develop and implement a multi-benefit land repurposing strategy focused on the acquisition of linear flood prone lands along the degraded waterways of the Salinas Valley. Over half of the \$10 million awarded will be used to fund land and conservation easement acquisition of irrigated lands vulnerable to flooding from willing landowners. This funding source is large enough and flexible enough to address the challenge presented by most grant funding sources.

To maximize the effectiveness and reach of the MLRP funds, CCWG and partners are now engaged in a discussion with Blue Forest Conservation, Aqauix, and American Rivers on ways to leverage state funds through private funding. Similar discussions are underway with The State Coastal Conservancy and US Fish and Wildlife to establish additional acquisition and implementation funding through federal agriculture grants.

Each funding program creates-specific guidelines that may place limits on how the acquisition funding can be used which will need to be evaluated. Key objectives to maximize the utility of acquisition funding include:

- *Purchase lands at full value of farmland.* For agricultural landowners to relinquish land for restoration, they require sufficient financial compensation to offset the long-term earnings potential (from crop production or farmer lease) of those lands. Land values are high in the Salinas Valley due to the high earnings potential of these lands (even those that periodically flood), necessitating the identification of secondary financial benefits besides land valuation to incentivize landowner participation. Focusing on restoring lands that can provide multiple water resource benefits, thereby creating the opportunity for secondary financial benefits, can make such transactions more enticing. Adding environmental enhancement benefits that community health, water quality, water supply, habitat, and/or climate-resiliency of the restored area and remaining farmlands can greatly increase the value of such projects.
- *Streamline the purchase process.* The acquisition of conservation easements on flood prone agricultural lands can be a long, complicated process frustrating both resource managers and the landowner(s). Additionally, because neither CCWG nor CCR is a land trusts or land holding organizations, the project team must work with other local land trusts on all easement acquisition transactions, further complicating negotiations.



To overcome these challenges CCWG has put together a Land Acquisition Committee to initiate and complete all easement negotiations made through the Multi-Benefit Land Repurposing Program. The Land Acquisition Committee consists of four land trusts working in the lower Salinas Valley (Ag Land Trust, Big Sur Land Trust, Elkhorn Slough Foundation, and Amah Mutsun Land Trust), and is led by Resource Conservation District of Monterey County staff. Establishing a team of members from all four land trusts offers a variety of expertise and capabilities in acquiring lands and provides flexibility as to which organization will hold each acquired easement, reducing acquisition process complications for both resource managers and landowners.

- *Incorporate benefits for regulatory compliance.* Land acquisition and habitat enhancement projects that credit the farmer for meeting regulations and water resource management objectives, such as Ag Order 4.0 and the Sustainable Groundwater Management Act, will ideally provide additional indirect monetary benefits to farmers. These benefits will come in the form of reduced financial and administrative costs and support self-directed implementation of actions needed to meet regulatory compliance.

#### Local funding opportunities

Securing local funding to support agencies who take responsibility for operations and maintenance tasks for restored areas will need to be obtained to ensure that public and watershed benefits are maintained. Proposition 218 limits the ability of local governments to pass ballot measures that establish new funding for existing or expanded services. County and local governments can attempt to achieve a super majority vote for a proposed increase in taxes and fees, but success for these initiatives is low. By partnering with agencies to develop voter initiatives that include funding to support flood plain resiliency and associated environmental benefits (water quality, groundwater sustainability, habitat, open space, recreation) may help increase voter support for tax initiatives aimed at supporting other services that may not be a priority for local voters. Efforts to develop new funding opportunities may include:

- Partner with Monterey County Water Resources Agency on a tax initiative to support existing infrastructure deferred maintenance (dams, floodways, river) and expand flood reduction services through adoption of floodway enhancement programs as described in this document.
- Work with Castroville Community Services District and the City of Salinas to increase coordinated maintenance of floodways that provide multiple public benefits (flood reduction, recreation and bike paths).
- Work with North Monterey County Parks to establish funding mechanisms to expand maintenance services to linear parks and floodway corridors.

### **Action 3 - Establish a Coordinator-type role to organize and consolidate various agency efforts in the lower Salinas Valley.**

Several regulatory bodies are already involved in climate resiliency and flood mitigation in the lower Salinas Valley including, Central Coast Regional Water Quality Control Board, Army Corps of Engineers., US and California Fish and Wildlife, Monterey County

Environmental Services, and Monterey County Water Resources Agency. Each agency has a finite regulatory and managerial responsibility for surface water resources within the Salinas Valley, none of which is to reestablish a functioning watershed system. Coordinated watershed management through the IRWMP and the hiring of a Salinas Valley Watershed Coordinator has begun a process of getting all parties involved in surface water resources management to be more aligned. California Department of Water Resources' Integrated Regional Water Management Program (IRWMP) provides regional oversight to aid development and implementation of water management solutions that increase regional self-reliance, reduce conflict, and manage water resources more strategically to better achieve social, environmental, and economic objectives.

**Action 4 - Adopt interagency collaborative actions in the lower Salinas Valley to better manage watershed processes.**

The Greater Monterey IRWMP has developed a set of plans that outline communal water resource management challenges and identified partners capable of supporting projects to meet these challenges. To coordinate these interagency collaborative exercises, a lower Salinas Valley Projects Coordinator has been hired to foster interagency dialog and coordinate program development and implementation. The coordinator will support efforts to acquire grant funds and develop common goals among agencies and municipalities in the lower Salinas Valley.

## 6. Conclusions

While there are still many challenges to establishing a sea level rise/climate resiliency program for the lower Salinas Valley, this report highlights the actions identified to surpass these challenges and the important steps that have been taken to better coordinate flood resiliency, first recognized as needed in the 1997 Northern Salinas Valley Restoration Plan. Acquiring flood prone land adjacent to degraded waterways from private landowners, using those lands to reestablish natural watershed processes and creating a centralized management system to manage and maintain these landform changes will be key going forward. This report provides the framework for approaching these tasks and will help ensure that the lower Salinas Valley more resilient to damage from the risks of climate change.

## Appendix: Climate/Flood Resilience Case Studies

### Case Study #1 – Castroville to the Coast

#### ***Project Description***

The unincorporated community of Castroville sits at the base of the Salinas Valley. The community is an urban center in the middle of a predominantly agricultural landscape that lacks green open space. Due in part to the surrounding agricultural land use, the water that flows past Castroville in the Tembladero Slough and other drainage ditches is some of the most polluted water in the state. In 2017, a State-approved income survey performed for Castroville by the Rural Community Assistance Corporation demonstrated the community to qualify as “severely disadvantaged” with a Median Household Income of just \$35,000. In addition to a lack of publicly accessible open space, the alignment of Highway 1 limits this underserved community’s access to their local beach, which can only be accessed via car, greatly restricting visits to their own beach.

The Castroville to the Coast project will setback and restore the floodplain along a three-mile stretch of the Tembladero Slough between the community of Castroville and Salinas River State Beach. This project may include a bike and pedestrian path parallel to the floodplain restoration to provide Castroville residents recreational access to the coast. By combining recreation and habitat benefits together, this multi-benefit project will improve wetland habitat, enhance surface water quality, increase flood resiliency, and provide coastal access to an underserved community.

The Castroville to the Coast concept is the result of a community outreach effort conducted by CCWG between 2014 and 2017 and funded through IRWMP grant funds. During this outreach effort, the community identified the lack of coastal access and publicly accessible open space, poor water quality, and flooding among their top concerns. New state funding opportunities that focus on multi-benefit projects in underserved areas makes the Castroville to the Coast project a great opportunity to invest in Castroville to create a well-managed system of creeks and wetlands.

#### ***Obstacles***

The Castroville to the Coast project is a pilot effort in the lower Salinas Valley to setback flood prone agricultural lands and restore floodplain processes that will provide multiple water resource benefits. All the challenges described within the Managed Retreat Strategy apply to this project. A significant portion of acreage within the Castroville to the Coast project area is in agricultural production, and while prone to flooding, remains highly productive and valuable land. Specific challenges to implementing the Castroville to the Coast project include food safety requirements, liabilities associated with special status species, and need to designate a responsible agency to provide ongoing maintenance of flood infrastructure.

#### ***Actions to Address Obstacles***

CCWG has developed the following tasks to address the obstacles facing the Castroville to the Coast project:

1. *Managed Retreat Strategy Development:* CCWG is working with partner organizations to develop additional incentives (beyond fair compensation for conservation easements) to encourage landowners to sell conservation easements for the Castroville to the Coast

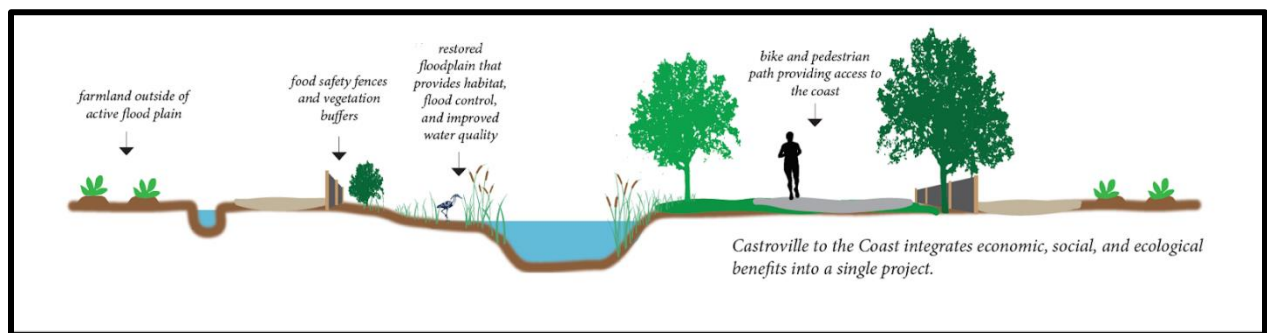


project. CCWG initiated a dialog with staff from US Fish and Wildlife, National Oceanic and Atmospheric Administration, and Monterey County Water Resources Agency charged with developing a Habitat Conservation Plan for the Salinas River Lagoon. CCWG is working with these organizations to identify how Castroville to the Coast can provide refugia habitat for species of concern such as the Tidewater Goby and Steelhead Trout to mitigate the negative impacts of lagoon flood management. Mitigating the negative impacts of Salinas River Lagoon flood management will increase the flexibility of breaching, helping reduce field flooding for upstream farmers during large storm events.

2. *Landowner Agreements:* Funding from the Multi-Benefit Land Repurposing Program and State Coastal Conservancy, and the formation of a Land Acquisition Committee, will provide CCWG with the necessary resources to draft conservation easement language and initiate negotiations with landowners. Securing signed landowner agreements to sell conservation easements on the project area acreage will require appraising the land, providing draft project designs to landowners for feedback, incorporating design features to address their concerns (i.e., food safety fencing) and continuing to develop additional incentives such as the one described above.
3. *Project Designs and Permitting:* After signed landowner agreements to sell are secured, CCWG will apply for additional planning and design funding to prepare 100% project designs based on the existing 30% designs, complete CEQA review, prepare and submit necessary permits, and develop a Long-Term Management Plan for the project.



**Figure 1A.** Coastal resilience project map for the Castroville to the Coast initiative.



**Figure 1B.** Labeled environmental benefits associated with improvements made with the Castroville to the Coast project.

## Case Study #2 – Espinosa Lake

### *Project Description*

Espinosa Lake is a naturally occurring freshwater lake in the lower Salinas Valley located between the City of Salinas and community of Castroville. The primary water source for inflows to the lake is runoff from the surrounding agricultural lands. Outflow from Espinosa Lake is controlled by pumps operated by Monterey County Water Resources Agency at the west end of the lake.

The proposed Espinosa Lake project will increase flood capacity to a 10-acre area currently in agricultural production (Figure 2A). This project will enable the Monterey County Water Resources Agency to manage lake heights at a higher elevation, storing approximately 630-acre feet of additional fresh water for summer reuse. The wetland restoration actions will increase stormwater impoundment capacity, create additional freshwater impoundments by raising the lake water level, and treat lake water quality through a sinuous treatment wetland. The increased volume of stormwater storage in Espinosa Lake can then be metered out during the dry season for use in the surrounding agricultural landscape or for reuse within the Castroville Seawater Intrusion Project. This project also includes an opportunity to construct a walking trail and/or nature viewing locations in the newly improved freshwater lake.



**Figure 2A.** Espinosa Lake water coverage with five-foot elevation storage extent. The green polygon to the west of the lake is the 10-acre parcel that will be used for seasonal flooding and treatment channels.

### *Obstacles*

The proposed 10-acre wetland restoration area on the western end of Espinosa Lake is seasonally in agricultural production. This area is owned by a landowner CCWG has not worked with before and thus does not have an established relationship. Initial discussions with the landowner and grower have been positive but additional dialog is needed. A challenge that has been averted

is that the landowner is in the process of selling an agricultural conservation easement on this property that prohibits development and requires the land to be kept in agriculture.

***Actions to Address Obstacles***

CCWG met with the land trust facilitating the agricultural easement sale and DOC staff to identify ways to integrate flood lands setback concepts into an active agriculture lands conservation easement project on the property adjacent to Espinosa Lake and future projects where this conflict may arise. DOC staff determined for the Espinosa Lake project that potentially restoring 10 acres of wetland on the parcel does not compromise objectives to establish an agricultural conservation easement on the whole parcel. CCWG drew on existing relationships in the region to establish a dialogue with the landowner. The landowner has expressed interest in continuing to discuss the Espinosa Lake project once the agricultural conservation easement process has been completed. Negotiations regarding this property will continue as part of the Multi-Benefit Land Repurposing acquisition funding, and construction funding has been earmarked within the Round II Integrated Regional Water Management Program (IRWMP) funding.



## Case Study #3 – Old Salinas River (OSR)

### ***Project Description***

The Old Salinas River (OSR) is the historical channel of the Salinas River connecting the Salinas River Lagoon with Moss Landing Harbor. This channel is bordered on both banks by irrigated row crop agriculture. Much of the land directly adjacent to the OSR is low-lying and flood prone. Several of these flood prone areas are absent of crops and often the only active management is weed control. The Old Salinas River project proposes to acquire these low-lying, flood prone lands from agricultural landowners and restore the floodplain for flood mitigation, habitat, and water quality enhancement benefits.

### ***Obstacles***

Unlike Castroville to the Coast or the Espinosa Lake project, the Old Salinas River project does not involve repurposing significant areas of agricultural lands currently in production. Most of these lands are not in production, which is a similar situation to other restoration projects CCWG has successfully completed in the Moro Cojo Watershed.

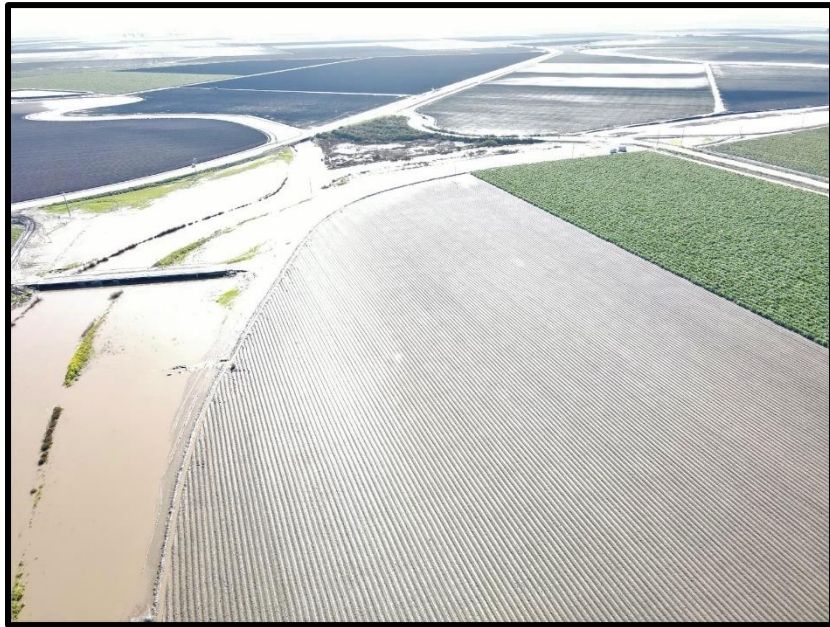
While compensation for revenue loss from crops is not an issue, landowners have concerns regarding selling easements without better assurances that regulatory liabilities associated with establishing wetland habitat adjacent to crop production will be limited. Concerns include:

1. Lack of safe harbor agreements to protect the landowner if threatened and endangered species present in the newly created habitat are harmed because of regular farming operations.
2. Uncertainty of benefits under Ag Order 4.0 for treatment wetlands water quality benefits.
3. Uncertainty if the Central Coast Regional Water Quality Control Board (Regional Board) will require riparian setbacks in the future in addition to setbacks currently proposed in this project.

### ***Actions to Address Obstacles***

1. *Safe Harbor Agreements.* As described in the Castroville to the Coast case study, CCWG is working with staff from US Fish and Wildlife, National Oceanic and Atmospheric Administration, and Monterey County Water Resources Agency charged with developing a Habitat Conservation Plan for the Salinas River Lagoon. Part of this work is identifying ways to protect farming operations adjacent to newly created habitat where threatened and endangered species may be present from any ‘take’ that may occur, whether this is developing safe harbor agreements or through some other mechanism.
2. *Credit for improving water quality under Ag Order 4.0.* CCWG and Central Coast Water Quality Preservation, Inc. are working with Regional Board staff to establish what benefits, such as reduced monitoring and reporting requirements, growers can expect to receive by treating their runoff via treatment wetlands or other collective treatment systems.

3. *Regulatory double counting.* The need to ensure that actions taken now by growers will not be either “Grandfathered in” or defined as natural wetland habitat, leading to additional actions being required of those who took early action to meet water quality standards, has been submitted to the Regional Board during public hearings. Until processes are developed to ensure that these proactive actions will receive proper regulatory designation as implementation efforts, each proposed project will need to receive regional board confirmation as being a self-directed action intended to support TMDL and Ag. Order implementation.



**Figure 3A.** Flooded areas along the Old Salinas River channel after January 2023 rains.