Central Coast Wetlands Group

To coordinate the advancement of wetland science and management on the Central Coast

Moss Landing Marine Labs | (831) 771-4463 | www.centralcoastwetlands.org

CCWG ANNUAL UPDATE LETTER

April 2020

Dear Central Coast Wetland Managers, Scientists, Colleagues and Friends,

The Central Coast Wetlands Group (CCWG) has had time over the last few weeks to reflect on the progress we and our partners have made over the past year and would like to use this opportunity to reconnect with you and share what we have been working on. We are excited to celebrate the progress we have made with the support of our collaborative community of wetland scientists and resource managers on the Central Coast. Thank you for your support and we hope you enjoy this update!

HABITAT RESTORATION

Salinas River State Beach Dune Restoration Project

Funding by State Coastal Conservancy and California Dept of Fish and Wildlife. Completed in partnership with California State Parks, Coastal Conservation and Research, Ecological Concerns Inc., Return of the Natives, California Reforestation, California Conservation Corps, Cypress Coast Fence, and Point Blue

In 2015, the State Coastal Conservancy funded the Salinas River State Beach (SRSB) Dune Restoration Project through the Climate Ready Grant Program. The natural dune vegetation at SRSB has been disrupted by the introduction of iceplant (*Carpobrotus edulis*), which undermines the dune's capacity to act as a protective barrier to sea level rise. CCWG, in partnership with California State Parks, Coastal Conservation and Research, and other partners worked to restore approximately 20 acres of sensitive dune habitat within areas most vulnerable to wave impacts. Restoration efforts included eradication of iceplant, planting native dune vegetation, and installation of interpretive signs at two main access locations and along the main dune trail to help educate the public about the project. CCWG also conducted vegetation surveys to characterize the plant community, and collaborated with Moss Landing Marine Laboratories (MLML) faculty to conduct surveys to study geomorphologic characteristics and the accretion of sand on the dunes over time.

Watershed Stewards Program members conduct a vegetation survey.

In 2019, CCWG and Coastal Conservation and Research received funding from CDFW's Environmental Enhancement Fund to initiate Phase 2 of the SRSB Dune Restoration Project. The project team will use these funds to expand the project area to the dune system between the Sandholdt and Potrero parking lots. CCR is propagating native dune plants and will plant them next winter. Dr. Ivano Aiello and Charlie Endris of MLML are creating digital elevation models using terrestrial laser scanners and unmanned aerial vehicles to map changes in dune topography.

Volunteers at a community planting event after successfully planting over 1,500 new plants!

North Monterey County Amphibian Habitat Enhancement Project

Funding by Wildlife Conservation Board and USFWS. Completed in partnership with North Monterey County School District, RCD of Santa Cruz County, RCD of Monterey County, Coastal Conservation and Research, Waterways, and California Conservation Corps

CCWG has worked with with North Monterey County School District and other partners to enhance upland and wetland habitat for the Santa Cruz long-toed salamander on a 25-acre piece of land adjacent to North Monterey County High School in Castroville. The restoration of this site is considered a priority enhancement location by biologists focused on reducing the species chance of extirpation from the area.

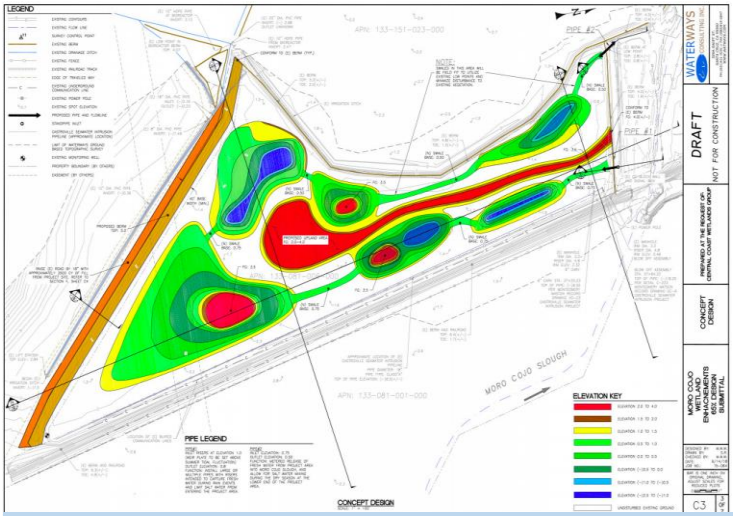
Since 2017, habitat enhancement efforts have included ground engineering to reduce erosion and create larger shallow wetland areas, removal of dense vegetation from the ponds to provide more open water habitat, weeding of non-native plants, planting of over 10,000 native plants to provide better upland cover for the salamander, and installation of a 4,900 ft long trail network with interpretive signage. Additionally, CCWG staff and their Watershed Steward Program AmeriCorps Members have coordinated and led three community planting days at the restoration site. These events have attracted over 120 community volunteers in total, many of which are students at the high school. CCWG staff have also been working with School District staff and teachers to organize field trips with K-12 students and develop content for the Natural Resource and Habitat Management class.

Hugo Tottino Wetland Restoration Project

Funding by the Ocean Protection Council. Completed in partnership with the Tottino family, Ocean Protection Council, Ocean Mist and Sea Mist Farms, Coastal Conservation and Research, and Elkhorn Slough Foundation

In 2017, CCWG, in partnership with Coastal Conservation and Research, received funding from the Ocean Protection Council through Proposition 1 to purchase and restore a 35-acre parcel in the lower Moro Cojo Slough. We have dedicated this project as the **Hugo Tottino Wetland** in memory and recognition of the decades of environmental leadership and support given to CCWG by Hugo and Ocean Mist and Sea Mist farms. This project will reconnect this historical wetland area with the main Moro Cojo Slough channel.

Earth moving is scheduled for this fall. Coastal Conservation and Research will plant native shrubs and other perennial plants to increase habitat complexity and help shade out annual weeds. Acquisition of the site is awaiting county approval and once complete will become the next portion of the historical Moro Cojo Slough to be transferred to the Elkhorn Slough Foundation for conservation in perpetuity.



Design plans for Hugo Tottino Wetland.

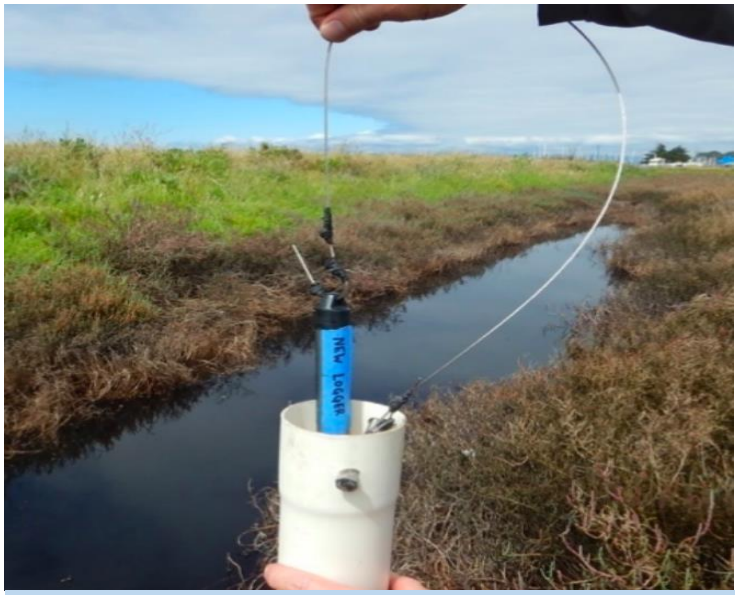
WETLAND MONITORING AND ASSESSMENT

California State Parks Bar-built Estuary Monitoring

Funding by US EPA.
Completed in partnership with the California Department of Parks and Recreation – Resource Management Division and California Wetlands Monitoring Workgroup

With funding from USEPA Region 9, CCWG worked with the California Department of Parks and Recreation to develop a bar-built estuary wetland monitoring program for use at their coastal State Parks. Bar-built estuaries (BBEs), also termed river mouth lagoons, are unique and important coastal wetlands in California. California State Parks owns or manages all or portions of more than half of these systems. Connecting marine, freshwater, and terrestrial ecosystems, BBEs are complex and dynamic systems that host a diversity of aquatic habitats and provide unique ecosystem services. Many BBEs have been physically altered, developed or mismanaged, resulting in dramatic losses in wetland area and ecological services. This project recognized the critical need for a detailed assessment of these ecosystems in order to direct management, conservation, and restoration actions. In coordination with State Parks, CCWG implemented a three-tiered monitoring program for BBEs in State Parks ownership. Full reports are available on our website.

Level 1 involves a landscape-level characterization of BBE wetland and riparian habitat, quantified historical habitat loss, and documented landscape stressors to document wetland extent and distribution and note adjacent land uses that pose impacts to these systems. Level 2 monitoring includes the California Rapid Assessment Method (CRAM), which provides an Index score of the condition of a wetland relative to other wetlands of that type throughout the state. Level 3 involves intensive site assessments which include beach sediment characterization, vegetation surveys, and deployment of temperature/depth loggers at State Parks throughout coastal California to document variability in water elevation and the resulting marsh plain vegetation supported by the unique hydrology of these systems.



In-Situ temperature/depth logger deployment.

Development of Riparian Rapid Assessment Method for California (RipRAM)

Funding by US EPA. Completed in partnership with the Central Coast Regional Water Quality Control Board, Southern California Coastal Water Research Project, State Coastal Conservancy, and San Francisco Estuary Institute

With funding from US EPA Region 9, CCWG has developed the Riparian Rapid Assessment Method (RipRAM) as a cost-effective ambient monitoring and assessment tool to document riparian condition of individual stream reaches, specific watersheds and entire ecoregions. RipRAM enables two or more trained practitioners working together in the field to assess the overall health of a riparian area by choosing a set of narrative descriptions of the local conditions. RipRAM yields an overall score for each assessed area based on the scores of eight metrics. The eight metrics are total riparian cover, vegetation cover structure, vegetation cover quality, age diversity and natural regeneration, riparian vegetation width, riparian soil condition and permeability, macroinvertebrate habitat patch richness, and anthropogenic alterations to channel morphology.

CCWG has received additional funding from US EPA Region 9 to validate the RipRAM tool, develop and test watershed condition estimation models, develop riparian zone protection and management goals, improve decision maker access to watershed condition data/information, and track progress towards meeting central and southern California riparian protection and enhancement goals. This project will help regional stakeholders and agencies prioritize hundreds of millions of dollars of State bond money allocated to protect, acquire and restore coastal stream and riparian habitats. CCWG is preparing a RipRAM training program to help wetland practitioners become proficient in the use of the RipRAM assessment tool and the online support tools. Please Contact Cara Clark (cclark@mlml.calstate.edu) for more information and to be placed on the email list.

REGIONAL PLANNING

Resilient Coast Santa Cruz: Building Resilience to Sea Level Rise

Funding by the California Coastal Commission and CalTrans. Completed in partnership with The City of Santa Cruz and Integral Consulting

Santa Cruz Beaches: The City of Santa Cruz and Central Coast Wetlands Group, with funding provided by the California Coastal Commission, are drafting a long-term plan aimed at addressing the hazards our beaches face from coastal climate change. By adopting a wholistic approach to addressing climate impacts to our beaches, the City will develop a strategy to achieve a 2100 coastline that benefits and is accessible to all.

For this planning exercise, the City of Santa Cruz beaches have been segmented into four areas to aid planning and identify site specific adaptation strategies and pathways. These segments are: 1) Seabright Beach between the Santa Cruz Harbor and

Watershed Stewards Program members conducting a RipRAM assessment.

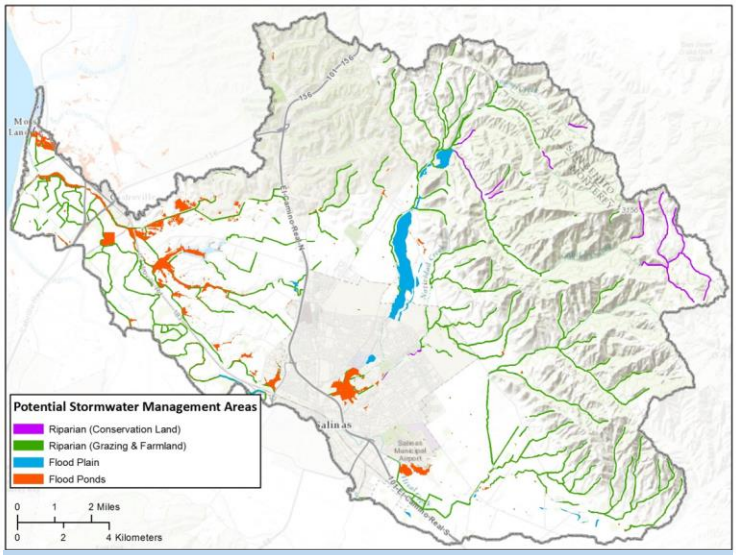
the San Lorenzo River, 2) Main and Cowells Beaches spanning from the San Lorenzo River to Bay Avenue, 3) pocket beaches of West Cliff, and 4) Natural Bridges State Beach. The intent of this project is to draft adaptation pathways that will help guide coastal management decisions needed to adapt to the unique coastal flooding and erosion hazards posed to each of these beaches. A focus of the effort is to maintain coastal access for all within the community.

West Cliff Drive: CCWG is working with Integral Consulting and the City of Santa Cruz to complete a parallel planning effort for climate hazards along West Cliff Drive. The West Cliff Drive project is focusing on erosion hazards that pose risk to cliff top infrastructure including the bike and pedestrian path, trails and other access ways to the beaches and ocean, and the roadway itself. This project is funded by CalTrans.

Salinas Valley Stormwater Plan

Funding by State Water Resource Control Board. Completed in partnership with The Greater Monterey County Integrated Regional Water Management Program members.

A Salinas Valley Storm Water Resource Plan (SWRP) has been developed for the Greater Monterey County Integrated Regional Water Management (IRWM) region. The SWRP planning process has enabled the IRWM members and stakeholders to explore new opportunities for storm water and dry weather runoff projects, as well as opportunities for integrating projects, in order to achieve multiple benefits on a regional scale. The overarching goal of this planning effort is to promote the implementation of storm water management projects that provide regional benefits of increased water supply, improved water quality, better flood protection, enhanced environmental quality, and greater community opportunity. The multi-factor watershed evaluation led to the identification of areas within the watershed where storage, treatment, flood reduction, infiltration, habitat restoration and community open space creation are most likely to maximize watershed-wide benefits.



Priority areas for multi-benefit stormwater projects.

WATER QUALITY ENHANCEMENT

Castroville Slough Treatment Wetland

Funding by State Water Resources Control Board. Completed in partnership with Coastal Conservation and Research, PG&E, Sea Mist Farms, Waterways Consulting, and Monterey County Mosquito Abatement

In 2017, CCWG constructed the 18-acre Castroville Slough Treatment Wetland to improve water quality by reducing nutrients and other nonpoint source pollutants, provide wildlife habitat, and help reduce flooding. Inlet water is pumped from the Castroville Ditch which drains approximately 800 acres of farmland as well as a portion of the stormwater runoff from Castroville. Water is gravity fed through a 1.25 km sinuous channel that supports wetland plants and sediments, removing nitrogen fertilizer from agricultural drainage water. The treated water then flows into the Castroville Slough and out to the Moro Cojo Slough before joining Moss Landing Harbor and Monterey Bay Sanctuary.

Staff at CCWG and Moss Landing Marine Laboratories designed a 12-channeled, 10,000 square foot bioreactor at the inlet of the Castroville Slough Treatment Wetland. This design allows CCWG to monitor nutrient reduction in agricultural runoff under different controlled conditions. Experimental substrates in the channels include

The multi-chamber experimental bioreactor at Castroville Slough Treatment Wetland.

woodchips, heated water with woodchips, algae, wetland plants, and control conditions.

CCWG, in partnership with the Resource Conservation District of Monterey County, has funding from the State Water Resources Control Board to test new media in the multi-chamber bioreactor and develop models to assist in designing and correctly sizing new bioreactors for real-world applications.

Twenty years of Water Quality improvements within the Moro Cojo Slough

A total of 6 treatment systems including sediment basins, wetlands, ponds and bioreactors have been installed in the Moro Cojo Slough watershed over a 20-year period with support from state grants, private funding and the cooperation of growers and ranchers. These systems cover 70 acres of land that treat runoff from 1,500 acres of productive agricultural land. These treatment wetlands provide multiple environmental and human benefits including restoration of wetland habitat, improved water quality, flood attenuation, research opportunities, education, and beautiful open spaces.

Nutrient load reductions were calculated for each of the treatment systems (bioreactors and treatment wetlands) within the Moro Cojo Slough watershed. Source water nitrate concentrations averaged 40-50mg/L and output concentrations of the combined

Locations of installed wetland treatment systems and habitat restoration areas within the Moro Cojo watershed. Yellow dots identify ambient water quality collection sites referenced within this study.

bioreactors and treatment wetlands were 2mg/L or less. To determine if the Moro Cojo Slough is meeting water quality objectives for total nitrogen, we have evaluated all available data (within the State CEDEN data repository) for adherence with Table 4.1 of the State Water Board delisting guidelines. We evaluated if water quality samples met the nitrate WQOs for three different timeframes: between 1999 and 2006 (before construction of treatment systems), between 2006 and 2016 (after Sea Mist and Dolan treatment systems were installed and before construction of the Castroville wetland and treatment), and after 2016 when all treatment systems were operating.

	Samples Collected		Number or Exceedances		Percent of Exceedances	
Year Range	Wet Season	Dry Season	8mg/l Wet Season	1.7mg/l Dry Season	8mg/l Wet Season	1.7mg/l Dry Season
1989-2006	96	95	10	24	5.2%	12.6%
2006-2016	147	171	1	14	0.3%	4.4%
2016-2019	31	54	0	0	0%	0%

Number and percent of water quality samples with total inorganic nitrogen values that exceeded seasonal water quality thresholds (8mg/L wet season and 1.7 mg/L dry season total nitrogen as N) before and after each treatment wetland were constructed. No samples since 2016 have been found to have DIN concentrations that exceed seasonal water quality objectives described in the Salinas TMDL.

Since operations of the Sea Mist treatment wetland began in 2006, total dissolved inorganic nitrogen concentrations at the bottom of the estuary (309MOR station) have exceeded the seasonal water quality objectives less than 5% of the time (as defined within the Salinas Valley Nutrient TMDL of 8mg/l during winter months and 1.7 mg/l during summer growing season, see table below). In the three years since the Castroville treatment system was constructed in 2016, nitrate concentrations within receiving waters have **NOT** exceed the seasonal total Nitrogen objectives. CCWG is now working with the Regional Board to recognize these water quality improvements.

UPCOMING PROJECTS AND EVENTS

California Rapid Assessment Method Training

CCWG is offering a CRAM training this summer from August 10th – 14th in Moss Landing. If you are interested in attending this training or a future training, please contact Cara Clark at cclark@mlml.calstate.edu.

WEBSITE UPDATES

Check out these new additions at www.centralcoastwetlands.org

- We have added a page with RipRAM information and resources including our most up-to-date field book and data sheet. Find this page under "Assessment Tools".
- SJSU students helped us create an interactive map showing the BBE data we have collected throughout the state. Find this page under "Assessment Tools".
- At the bottom of our home page, explore an interactive map to find out more about our habitat restoration projects.

Do you have questions? Interested in working together? Please contact Kevin O'Connor at (831) 771-4495 or koconnor@mlml.calstate.edu with any ideas, questions or comments – we'd love to hear your feedback.