

*Summary and Call to Action*

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# WETLANDS ON THE EDGE

*The Future of Southern California's Wetlands*

# REGIONAL STRATEGY 2018





**PROJECT MISSION:**

*To expand, restore and protect wetlands in Southern California's coastal watersheds.*

**PROJECT VISION:**

*Restored and protected wetlands and rivers along the Southern California coast benefitting wildlife and people.*

# THE STRATEGY IN BRIEF

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Southern California's coastal wetlands are an essential part of the region's natural heritage, and they provide numerous benefits for our economy and quality of life. From the lagoons of Santa Barbara and Malibu, to the popular trails at Ballona wetlands, to the internationally significant Tijuana River Estuary, our coastal wetlands are oases of nature in a heavily urbanized landscape. In Southern California, a region with over 30 million people, wetlands are often times the only natural spaces remaining within the urban matrix. It is critically important to protect these environments as natural places as for enjoyment by people, as homes for valued wildlife, and as outdoor classrooms for children. Our wetlands also support abundant wildlife, clean water, climate regulation through carbon storage, and flood protection. They are engines of productivity for local fisheries and the shorebirds and waterfowl of the Pacific Flyway. They can even help protect our shorelines from rising sea levels in the future. But, without bold action, these valuable Southern California resources will be largely lost in coming decades.

Just 150 years ago, a chain of wetlands of remarkable diversity and richness dotted the Southern California coastline. This wetland legacy included vast tidal marshlands, protected bays, glistening salt flats, river-mouth lagoons, and beach-dune complexes. Each of these dynamic systems changed with the daily tides and the seasons, supporting a vast array of wildlife throughout the year.

Today, Southern California's coastal wetland systems have been greatly diminished and altered. For the past two centuries of U.S. history, wetlands have been regarded by European settlers as wastelands to be drained and filled, despite the invaluable role that wetlands played in the lives of coastal Native American tribes for millenia. Most of the wetlands that existed in California at the time of statehood were lost within the following hundred years. This story holds true in coastal Southern California, where urbanization has destroyed over 62 percent of the historical intertidal wetlands.

Of the 330 coastal wetlands that historically existed between Santa Barbara and San Diego, there are only 105 remaining today, and those systems are smaller than they used to be, fragmented, and many are cut-off from their natural sources of water and sediment. The diversity of coastal wetland types has also suffered—lagoons, river mouths and small creeks have been modified for navigation and flood protection, and filled by development. This has left the remaining wetlands in a poor state, more vulnerable to disturbance and stress. While urbanization will continue to impact wetland habitats, the added stress of climate change and sea-level rise further challenges the survival of these delicate ecosystems.

Southern California has already lost 62% of its historic 33,400 acres of coastal wetlands, without intervention an additional 800 acres will be lost after 24 inches of sea-level rise, and a further 2,900 acres will be inundated by a 66-inch rise (predicted to occur by 2100). Predicted wetland losses could be offset by facilitating the migration of wetlands into adjacent uplands that will be inundated as sea levels rise. With 24 inches of sea-level rise (currently predicted to occur around 2050), 7,700 acres of current upland habitat could become wetlands if actions are taken to facilitate, or not impede, that migration.

The drastic loss of wetlands together with an increasing understanding of their value have spawned an era of much-needed wetland protection and restoration. To that end, the Southern California Wetlands Recovery Project (WRP) is a group of federal and state agencies that have been coordinating their efforts around wetlands protection and restoration for almost 20 years. For the past 15 years, the WRP agencies have recognized the need for a better roadmap of how and where to restore wetlands, to coordinate efforts and maximize financial investments. To develop this roadmap, the WRP called upon scientific experts, wetland managers, and restoration practitioners to help develop a science-based plan to guide wetlands protection and restoration from a regional perspective.





The result of this collaboration is *Wetlands on the Edge: The Future of Southern California's Wetlands, Regional Strategy 2018*, a comprehensive guide for the recovery and long-term survival of Southern California's wetlands. In this report, over 50 scientists and resource managers analyze how our wetlands have changed, their future potential and threats, and how we can ensure their health into the future. The Regional Strategy was developed through a four-year process. This strategy provides quantitative objectives for wetlands recovery that are based on our understanding of historical wetland location and area, current stressors on wetland ecosystems, such as development, and the future threat that is posed by sea-level rise and climate change.

# RESTORATION OBJECTIVES

The roadmap for how and where to restore current and future wetland areas is provided in the Restoration Objectives below. Implementation of the Objectives would include the continued management of existing wetlands, immediate action to restore currently degraded wetlands, and the protection and enhancement of wetland-upland transition zones that may become tomorrow's wetlands.

## GOAL 1:

**Preserve and restore resilient tidal wetlands and associated marine and terrestrial habitats**

### **Protect and Restore Wetland Abundance and Size**

**PROTECT WHAT WE HAVE:** Maintain the 8,600 acres of existing tidal wetlands through protection, restoration and enhancement measures. Actions include restoring tidal dynamics to areas that were wetlands in the past.

**RESTORE WETLANDS FOR THE FUTURE:** Facilitate the future restoration of 7,700 acres of tidal wetlands. Actions include facilitating wetland expansion into wetland-upland transition zones through protection and enhancement measures (this might require acquisition) and restoring tidal action to areas that could be wetlands in the future, including land that is currently developed such as parking lots and agricultural fields.

**INCREASE WETLAND SIZE:** Regain some of the large tidal

wetlands that have been destroyed. Restoration needs to occur beyond the existing wetland perimeters and join together existing fragments in order to recover the areas that have been lost.

### **Protect and Restore Uplands around Wetlands**

A major shift in our approach to wetland recovery must be from protecting only areas that are currently wetland, to also protecting areas that are currently upland but will be wetland in the future. The upland edges of tidal wetlands provide unique habitats, refuge for marsh wildlife, access to food and other resources, and serve the crucial role of providing space for wetland expansion. However, much of these wetland-upland transition zones have been lost to development. Without wetland expansion, sea-level rise will convert coastal wetlands into mudflats and subtidal habitats, altering the appearance and functions of wetlands as we know them, and placing additional sensitive infrastructure in the path of rising waters.

**PROTECT TRANSITION ZONES FOR SEA-LEVEL RISE:** Protect all our remaining wetland-upland transition zones, while also expanding these habitats to at least 40% of the wetland perimeter and up to 1,600 feet from the wetland edge.

### **Restore Wetland Connections**

Sea-level rise will have particularly dramatic impacts on coastal wetlands because of the changes that we've already made to the way these ecosystems work. The construction of roads, bridges and levees has completely changed water and sediment flow, which are defining processes that support estuarine systems. Tidal creeks, channels and ocean inlets that were once dynamic and roamed across their floodplains have become fixed in place and stationary. Connections with the

ocean have been diminished and altered. These alterations disrupt tidal processes and lead to changes in wetland habitats and the species that they support.

**RECONNECT WETLANDS WITH WATERSHEDS AND THE OCEAN:** High priority should be given to projects that remove barriers that disconnect coastal wetlands from the ocean and the watershed. Reconnecting wetlands with the ocean and rivers that supply water and sediment will allow recovery of lost wetland habitat.

**RESTORE CONNECTIVITY FOR CURRENTLY FRAGMENTED SYSTEMS:** Building roads, bridges and levees has severed wetlands and created small fragments from big coastal wetlands that once existed. The fragmentation that has occurred will impede the wetlands' ability to expand and keep pace with sea-level rise. The recommended strategy is to reconnect wetland fragments into coherent systems by removing barriers that have been built in the wetlands and by allowing natural processes to work without interventions and active management.

**RESTORE PHYSICAL AND HYDROLOGICAL PROCESSES:** Tidal range and extent, which today is often muted, should be unimpeded to support appropriate habitat compositions. Water and sediment flow should be sufficient to maintain marsh elevation in the face of sea-level rise, because estuaries need sediment to sustain themselves.

### **Protect and Restore a Diversity of Wetland Types and Habitats**

The ecological health and resilience of coastal wetlands is dependent upon the diversity and complexity of their habitats. There has been a particular loss of intertidal wetland habitats, such as marshes and flats, which has deteriorated the unique functions that our coastal wetlands provide, such as supporting the wealth of wildlife that has been a fixture of California's coast.

**MAINTAIN AND RESTORE THE DIVERSITY OF SOUTHERN CALIFORNIA WETLAND TYPES (OR "ARCHETYPES"):** Each unique wetland type provides distinct functions that support the matrix of wetland ecosystems throughout the Region. Understanding the historical distribution of wetland types can help guide the restoration of wetland types that the landscape can support.

**RESTORE COASTAL WETLAND COMPOSITION:** The mix of intertidal and subtidal habitats has shifted dramatically as a result of human modification, while accelerated sea-level rise is likely to cause further conversion to deeper open water habitats. Efforts should be made to prioritize intertidal wetlands protection and restoration. Particular attention should be given to protecting existing salt flats and subtidal habitats associated with wetlands.



MISSION BAY WETLANDS • PHOTO BY JOANNA GIKESON, COURTESY OF USFWS



# GOAL 2:

## Preserve and restore streams, adjacent habitats, and other non-tidal wetland ecosystems to support healthy watersheds

Although the primary focus of this document is the recovery of coastal wetlands, the health of coastal wetlands is intimately linked to water and sediment flowing from the watersheds. Therefore, achieving the Objectives of Goal 1 requires restoration and management of the streams and non-tidal wetlands. The following Objectives will guide the restoration of non-tidal wetlands within the coastal watersheds.

**PROTECT WHAT WE HAVE:** Maintain 160,000 acres of existing streams and non-tidal wetlands through protection, restoration and enhancement measures.

**RESTORE NON-TIDAL WETLANDS:** Restore almost 50,000 acres of non-tidal wetlands in watersheds, to achieve 210,000 acres of non-tidal wetlands.

**RESTORE WETLAND COMPOSITION:** Restore or maintain 189,040 acres of streams and associated adjacent habitat and 21,000 acres of other non-tidal wetlands (depressional, slope, etc.).

**RESTORE CONNECTIVITY IN WATER AND SEDIMENT:** Ensure that there are no artificial physical barriers that obstruct water, sediment, and wildlife movement from watersheds to coastal wetlands and remove 100 percent of the total and partial barriers to steelhead passage in the high priority watersheds.

# GOAL 3:

**Support education and compatible access related to coastal wetlands and watersheds**

Southern California is an urban environment and recovering wetlands will enhance the quality of life for the 30 million people who live in the region. In order to support education and public access, the WRP will pursue projects that enhance the public's enjoyment and understanding of wetlands, improve community stewardship, and better serve disadvantaged and underserved communities.

SOUTH SAN DIEGO BAY NATIONAL WILDLIFE REFUGE • PHOTO FROM CENTRAL ELEMENTARY SCHOOL



# GOAL 4:

## Advance the Science of Wetland Restoration and Management

One of the key roles of the Wetlands Recovery Project is to apply the best available science to wetland management decisions. Through the development of this Regional Strategy, we have identified the following Science Objectives to continue to advance our understanding:

1. Analyze the ecological and physical effects of coastal jetties and other hard infrastructure on wetland function.
2. Develop quantitative objectives for the unique wetlands of the Channel Islands.
3. Implement a regional wetland monitoring and assessment program.
4. Maintain a standing Science Advisory Panel for the region
5. Refine the sea-level rise vulnerability assessment to be more site-specific and incorporate new data.
6. Refine the quantitative objectives for salt flats, intermittently-open/closed estuaries, wetland-upland transition zones, and shallow subtidal areas.
7. Refine the objectives for non-tidal wetlands (streams, rivers and other freshwater wetlands).



## IMPLEMENTING THE REGIONAL STRATEGY

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The Regional Strategy 2018 will be implemented through the work of the WRP partners, and updated as we make progress toward our Objectives and as new science becomes available. The Objectives will help guide all levels of stakeholders in the wetlands community from resource agencies to funders to restoration practitioners in designing projects, reviewing project proposals, and making funding decisions. Restoration practitioners and land managers will utilize the project guidance and regional data presented in this document to develop projects that accomplish the WRP Goals and Objectives.

The WRP Work Plan is a list of projects that are consistent with the Goals, Objectives, Management Strategies, and Guiding Principles identified in the Regional Strategy 2018. The Regional Strategy 2018 provides the WRP agencies with a framework to discuss, assess and provide feedback on projects. The Work Plan allows the funding agencies to agree on project design and approach, and coordinate funding for the most efficient and effective expenditure of resources.

The Work Plan identifies projects for all four of the WRP's Goals, and funding for projects will come through the unique funding sources of each WRP partner agency. Work Plan projects range from flagship tidal wetlands restoration projects to scientific studies focused on improving our knowledge of wetlands restoration and management. Stream restoration and fish passage projects are essential to the Work Plan, as is the Community Wetlands Restoration Grant Program, which focuses on education and outreach while also restoring habitat.

## RESTORATION TODAY; RESILIENCE TOMORROW

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Wetlands restoration projects take approximately 20–40 years from planning to completion of a fully functioning wetland. Because of the rapidly increasing rate of sea-level rise in the second half of this century, wetland restoration must occur before 2030 in order to establish mature marshes that are more resilient to sea-level rise. If the ultimate aim is to establish resilient vegetated marshes by 2050, such efforts need to start immediately.

Implementation of the Restoration Objectives must be prioritized in order of which should be started immediately and which can begin later. Strategies to protect and acquire land not in public ownership, particularly open adjacent upland areas that are or could become transition zone habitat, should be the highest priority since these areas are subject to high development pressures and may not be available in the future. The availability of wetland migration areas within wetland-upland transition zones will determine the fate of wetlands in the future. Reconnecting natural water and sediment sources to wetlands is also a high priority. The availability of sediment will determine the ability of wetlands to keep pace with sea-level rise through sediment accretion. In the longer-term, the removal or realignment of barriers, such as berms, to wetland migration will be necessary. This may require the relocation of infrastructure and developments through managed retreat and would therefore require a longer, more involved, planning process.

*The message of the Regional Strategy is clear but challenging: without immediate and courageous action, coastal wetlands as we know them in Southern California will be altered or lost completely due to sea-level rise. Our actions must be innovative and will involve removing or reconfiguring human-created impediments to natural water flows and dynamic wetland functions, reconnecting fragmented areas in order to regain larger wetland areas, and facilitating the landward expansion of wetlands into areas that are currently upland habitats. If these measures are not taken today, we stand to lose some of the last natural spaces that exist in the vast urban landscape of coastal Southern California.*

— **John Laird**  
CALIFORNIA SECRETARY  
FOR NATURAL RESOURCES



LONG-BILLED CURLEW • PHOTO COURTESY OF PHIL ROULLARD

To access the Regional Strategy 2018, and associated maps and tools, visit [www.scwrp.databasin.org](http://www.scwrp.databasin.org).

For inquiries and information on the Wetlands Recovery Project, visit [www.scwrp.org](http://www.scwrp.org).

FRONT COVER:  
ORMOND BEACH • PHOTO BY PETER BRAND, CALIFORNIA STATE COASTAL CONSERVANCY

