Guiding the Future of Restoration – Overview

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Since the publication of the Baylands Ecosystem Habitat Goals in 1999 and the subsequent Joint Venture Implementation Plan, more than 50,000 acres of tidal wetlands have been protected, restored, or enhanced in the San Francisco Estuary. The original focus was to restore historic tidal marsh to provide habitat for threatened and endangered species and restore ecological function to tidal systems.

A decade-and-a-half later, many lessons have been learned, the importance of sub-tidal and transitional habitats has been acknowledged, and projects are designed and constructed for multi-species and multi-habitats. Restoration sites are evolving and wildlife is returning and other species are occupying new habitats.

Dynamic ecosystems require a dynamic approach to planning and restoration. The urgency to address the impacts of climate change and other environmental stressors will require managers and regulators to respond rapidly with management and policy changes as new information is forthcoming. This session will reflect on lessons learned and look forward to how we can adaptively make decisions and manage for change.

Keywords: Restoration, Future, Climate Change, Adaptive Management, Infrastructure, Policy

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Speaker Biography: Beth Huning is the Coordinator of the San Francisco Bay Joint Venture, a public-private partnership for wetlands protection and restoration. She has been actively involved in wetlands conservation in the Bay Area over 30 years, including 18 years with the National Audubon Society in various capacities and as the director of Richardson Bay Audubon Center & Sanctuary when she helped found and chair the Joint Venture. She holds a BA in geography and was honored in 2001 as a Fellow by the Stanford Graduate School of Business Center for Social Innovation for non-profit management. In her free time, she hikes, kayaks, photographs, travels the world and is the 2011 recipient of the North American Nature Photography Association's Philip Hyde Grant award for conservation photography.

South Bay Salt Pond Restoration Project: Adaptive Management in Action

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The South Bay Salt Pond Restoration Project (www.southbayrestoration.org) is the largest wetlands restoration project on the West coast of the United States. It is unique not only for its size— over 15,000 acres— but also for its location adjacent to one of the nation's largest urban areas, home to over 3 million people. The Project is intended to restore and enhance wetlands in South San Francisco Bay while providing for flood management and wildlife-oriented public access and recreation.

We have identified long-term alternatives for the Project, each representing a continuum toward different end-states: one end-state represents 50% of existing ponds converted to managed ponds for waterbirds and 50% restored to salt marsh habitat, and the other end-state represents 10% of the existing ponds converted to managed ponds and 90% restored to marsh habitat. The final ratio of managed ponds to salt marsh habitat will depend on the outcome of the Adaptive Management Plan, which will be implemented over the next 50 years. The Plan will allow for scientific information gained from earlier phases and applied studies to be incorporated as management objectives and designs of future actions are revised and implemented.

The Project has completed most of the Phase 1 studies, and much has been learned about key uncertainties. This presentation will summarize the results of some key studies and how managers have revised management actions and restoration designs in response to scientific research.

Keywords: wetlands, restoration, adaptive management, waterfowl, shorebirds, saltmarsh, restoration design, sediment

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Speaker Biography: Laura Valoppi, of the U.S. Geological Survey, has been the Lead Scientist for the South Bay Salt Pond Restoration Project since May 2009. The SBSPRP is restoring 15,000 acres in South San Francisco Bay to a mixture of salt marsh and pond habitat. She is the primary science representative of the restoration project and oversees an $8 million multi-disciplinary research program conducted by teams of researchers from USGS, universities, non-profits and consultants. This is a long-term project requiring the consideration of many aspects of San Francisco Bay geomorphology, geology, water use and quality, chemistry, toxicology, and ecology. Laura has over 27 years of experience in restoration, natural resources, water quality, wildlife toxicology, risk assessment, and endangered species in California.

Restoring Ecosystems as Sustainable Infrastructure in a Changing World

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Climate change and the reduced inflow of sediment to the estuary are examples of the increasingly dynamic nature of the Bay Area's future. Our public infrastructure will need to account for these dynamic future conditions in its design and construction in order to continue to function effectively. Sustained function as conditions change is a useful definition of resilience.

The capacity of ecosystems to be resilient to stress while providing multiple benefits suggests that integrating ecosystem restoration into infrastructure planning is a valuable strategy to create more sustainable infrastructure in the future. Successfully envisioning and implementing this strategy requires understanding the biogeochemical processes operating in the landscape, the influence of these processes on valuable attributes of the landscape, and how these processes will change in our more dynamic future. While it is clear that some locations are more likely than others to benefit from ecosystem restoration, it also appears that restoration of ecosystems can provide benefits regionally.

By building our understanding of ecosystem function and applying this to infrastructure design and construction, we can develop cost-effective approaches for enhancing regional resilience to our dynamic future. However, ecosystem restoration takes time, and given the expected acceleration of sea level rise and other climatic changes in coming decades, now is the time to be restoring regional ecosystems to build resilience. Our ability to accelerate this development now will enhance the benefit/cost ratio for future infrastructure projects while continuing to maintain the natural beauty that is an integral part of the economy and quality of life of the Bay Area.

Keywords: ecosystems, restoration, shoreline, natural infrastructure, climate change, sea level rise

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Speaker Biography: Dr. Andrew Gunther received his Ph.D. in Energy and Resources from the UC Berkeley in 1987, and has worked at the intersection of environmental science and policy since 1979. He is currently serving as the Executive Coordinator of the Bay Area Ecosystems Climate Change Consortium under contract to the California State Coastal Conservancy. He has worked on developing ecological indicators for the Bay Area since 2001, and he was the project leader for the State of San Francisco Bay in 2011 for the San Francisco Estuary Partnership. Dr. Gunther previously served (1991-2001) as the Assistant Chief Scientist for the Exxon Valdez Oil Spill Restoration Program, where he helped coordinate development of the restoration science program. Dr. Gunther was the original manager (1993-1997) of the Regional Monitoring Program for Toxic Contaminants in the San Francisco Estuary, and is a member of the Board of Directors of the Union of Concerned Scientists.

Climate Change: Policy Challenges for Restoration

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Our current policy framework in the face of climate change pressures has many gaps and obstacles to the successful planning, implementation, and achieving outcomes of ecosystem restoration in the San Francisco Estuary. All the laws we rely on to guide us – Endangered Species Acts, Clean Water Act, McAteer-Petris Act, CEQA, NEPA, and many more – were established in response to pressures entirely other than climate change. Climate change will exert pressures that bridge across these vital yet often insular policy mandates. The core of our policy challenge, then, is to protect their underlying intents while evolving them to be responsive to climate change's multi-faceted ramifications. What are some examples of these policy challenges? Allowing boldness in action and time for results where certainty of outcome is not high. Allowing some impacts now from actions that will, we hope, give us "resiliency". Preserving landscapes that later will be essential to continued ecological functions and ecosystem services. Choosing between investments in "holding the line" vs. "managed retreat" in shorelines, levees, flood management, and more. Treating sediment as the critical commodity that it is. Accommodating seemingly "novel" approaches. Supporting long-term analytical foundations essential for informed decision-making especially in the face of political and economic pressures. Moving restoration efforts expeditiously through regulatory approvals without burdensome requirements so that we shave years and decades off taking action. Bringing to bear the fiscal resources early on when costs are less for the same results. Flexibility and responsiveness in climate change projections. Funding and allowing landscape-scale adaptive management. Recognizing that inaction will not preserve the status quo. And all the while, human society will be exerting a wide range of other pressures, natural disasters may well reorder our natural and human systems, species invasions will continue, and our knowledge and skills will continue to grow.

Keywords: climate change, restoration, policy, wetlands, sea level rise, resiliency

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Speaker Biography: Dr. Stuart Siegel is Principal of Siegel Environmental and Coastal Resilience Specialist for the San Francisco Bay National Estuarine Research Reserve. He focuses on the intersections of climate change, natural resources resiliency, ecosystem restoration, management-relevant science, and regional planning. He has been at the forefront of ecosystem restoration before it gained its modern name, and has worked on climate change-driven projects for several years. Dr. Siegel has lead design teams for several wetland restoration projects responsive to climate change, including Aramburu Island, Sonoma Creek, and Sears Point. He was a co-lead scientist for DRERIP, technical lead for the Delta Vision Ecosystem Workgroup, Suisun Marsh Plan Science Advisor, and lead PI for the Integrated Regional Wetland Monitoring Pilot Project. He co-authored the Wetland Carbon Sequestration Road Map to Implementation, authored the climate change chapter of the Moyle Suisun Marsh book, and served on technical advisory panels for large restoration projects.