A Delta Renewed: A Guide to Science-Based Ecological Restoration in the Delta

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The Sacramento San-Joaquin Delta is a linchpin of California's water supply, an important agricultural area, and home to native wildlife found nowhere else in the world. This vital region is hampered by poor water quality, an over-allocated water supply, decaying infrastructure, invasions of alien species, and novel ecosystems that no longer support desired functions. Creating a healthy future Delta ecosystem requires understanding what that ecosystem looks like. While regional planning efforts identify the need to restore large tracts of interconnected habitats, very little information is available to help design the complex landscapes that are likely to achieve this goal. To help fill this gap, we drew on an understanding of the Delta's historical ecology (circa 1800) and a detailed study of landscape change since the pre-development period. We used this information to identify a series of strategies for restoring resilient landscapes in the Delta that could provide a broad suite of desired ecological benefits. These strategies identify and emphasize the reestablishment of large-scale processes of sediment and water movement that sustain interconnected habitats (as opposed to emphasizing the restoration of habitats themselves). Examples of strategies include 'Reestablish tidal marsh processes in areas at intertidal elevations,' 'Reestablish connection between streams and tidal floodplains,' and 'Reestablish fluvial processes along actively migrating streams.' For each strategy, we layered relevant environmental data sets to identify areas where the strategy might be implemented and considered how individual strategies should be arranged and combined to achieve desired ecological functions at the landscape-scale. These strategies can be referenced during regional and local planning processes as a framework for how individual projects planned in the near-term can contribute toward a coherent, long-term vision of improving ecosystem function across the Delta.

Keywords: Sacramento San-Joaquin Delta, process-based restoration, historical ecology, regional planning

Session Title: Delta Restoration Planning: Integrating Multiple Objectives and Providing for Local Engagement

Speaker Biography: Letitia Grenier co-directs the Resilient Landscapes Program at the San Francisco Estuary Institute. Her focus is to help conserve California's living resources by developing landscape-scale, collaborative visions and solutions for ecological resilience. She was the science lead for the 2015 State of the Estuary Report and the 2015 climate change update to the Baylands Ecosystem Habitat Goals, heading a team of over 200 environmental scientists, managers, and regulators to develop recommendations for restoring and maintaining the health the Bay's tidal wetlands in the face of rising sea levels and other stressors. She is a principal investigator for the Delta Landscapes project, which has completed in-depth analyses on the

change in the Delta over time and is now offering guidance on how ecosystem health can be recovered as part of this working landscape. Letitia has a Ph.D. in Conservation Biology from the University of California at Berkeley.

The Delta Plan: Protect, Restore, and Enhance the Delta Ecosystem

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The 2009 Delta Reform Act directs the Delta Stewardship Council (Council) to ensure that the Delta Plan includes broad, measurable, and science-based goals, objectives, and strategies that improve the Delta estuary and wetland ecosystems. The Delta Plan (2013) defines restoration (Water Code Section 85066) as "the application of ecological principles to restore a degraded or fragmented ecosystem and return it to a condition in which its biological and structural components achieve a close approximation of its natural potential, taking into consideration the physical changes that have occurred in the past and the future impact of climate change and sea level rise." In 2015, with the State's pivot away from the comprehensive ecosystem-based planning of the Bay-Delta Conservation Plan, the Council made a commitment to revisit the Delta Plan to assess the need for revised approach to landscape-level planning through an amendment to the Ecosystem chapter. In this panel discussion, Jessica Law, Chief Deputy Executive Officer, will discuss the Council's approach to developing revisions to the Delta Plan in partnership with other local, State, and Federal agencies and stakeholders, and discuss how the tremendous amount of progress that has been achieved over the past few years lays a future for Delta restoration work.

Keywords: Delta Stewardship Council, Delta Plan, ecosystem restoration, planning, outreach

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Speaker Biography: Jessica Law, Chief Deputy Executive Officer at the Delta Stewardship Council, has been working on land use planning and natural resource management in California for the past ten years, mainly focused on the Sacramento-San Joaquin Delta. At the Delta Stewardship Council she leads a variety of efforts intended to increase State and Federal agency coordination and collaboration, and support decision-making based on best-available science. Jessica is a certified land use planner and a member of the American Planning Association, and holds a bachelor's degree in Ecological Biology from Connecticut College and a Masters in Regional Planning from the University of Massachusetts, Amherst.

Delta Conservation Framework: Building Community and Integrated Practices for Delta Conservation

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For many years, agencies, stakeholders, scientists, and planners have tried to arrive at a collective vision for the conservation of ecosystems in the Delta. In recent decades great strides have been made in advancing Delta science capacity. Despite these efforts to unite the various Delta interests around a common vision for conservation in the Delta, to date the region remains confronted with many problems, including native species declines, invasions of alien species, and a complex and costly water management structure. The Delta Conservation Framework is a collaborative effort intended to advance conservation in the Delta, Yolo Bypass, and Suisun Marsh through 2050. It offers a new planning paradigm that combines the needs of the Delta community with scientific guidance on rebuilding functional ecosystems. The Delta Conservation Framework includes long-term, landscape-scale goals to achieve this vision, and promotes an approach focused on education, cooperation, and collaboration with Delta stakeholders and community members. Strategic conservation that builds on the history and environmental richness of the region can contribute to the strong sense of place and socio-economic values of the Delta. Through non-traditional partnerships and a focus on multi-benefit outcomes it is possible to identify paths forward which integrate ecosystem conservation with socio-economic needs at the landscape scale. For example, the Delta Conservation Framework highlights the need to focus conservation efforts on public lands in each region of the Delta. The Delta Conservation Framework envisions the Delta in 2050 as a place composed of resilient natural and managed ecosystems situated within a mosaic of towns and agricultural landscapes, where people prosper and healthy wildlife communities thrive.

Keywords: Delta, conservation, framework, restoration, ecosystems, vision, community, landscape-scale, collaboration, partnerships

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Speaker Biography: Dr. Christina Sloop is a Senior Environmental Scientist in CDFW's Ecosystem Conservation Division. She has worked for over 25 years in the fields of ecology and natural resource conservation across California, and North America's Central and Pacific flyways. Her scientific expertise spans across multiple disciplines, including conservation science, wetland ecology, climate adaptation, migratory birds, and population genetics. She has served as science advisor on a number of federal agency technical committees. She joined CDFW in 2016 to lead the Delta Conservation Framework planning effort. Dr. Sloop has led or contributed to the development of conservation planning documents, including the 2015 California Wildlife Action Plan, 2015 Baylands Ecosystem Habitat Goals Science Update for Climate Change, and 2012 SFBJV San Francisco Bay Monitoring and Evaluation Plan. She also participated in developing a collaborative decision-analytic framework for the San Francisco Bay to maximize resilience of tidal marshes to climate change.

Regional Restoration and Agricultural Sustainability Planning: Informing Best Ecological Outcomes with Least Impact to Land Uses

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The Delta Conservancy is supporting two regional planning efforts to engage the Delta community and agencies in collaborative processes to identify how science based ecosystem restoration and agricultural sustainability can be compatible. Phase 1 of the Cache Slough Planning Project was a pilot test of a new concept of collaborative planning in the Delta. The project brought together Cache Slough regional interests with State and local government agencies to evaluate all components of the system to determine potential opportunities and conflicts among all beneficial uses within the Cache Slough Complex. Where could ecosystem values be enhanced while co-existing sustainably with other current beneficial uses of land and resources in the CSC? The collaboration effort was successful in demonstrating that the various interest groups are motivated to work together to gather, evaluate, and support the use of appropriate data sets and other information for consideration in the planning process. Data collection, review, and validation was viewed as valuable by the participants. Data overlays, evaluation, and interpretation was limited in Phase 1, but began to show the potential for visualization to foster discussion and agreement. Additional collaboration will be needed in Phase 2 to determine which data will be most useful in analysis and decision-making. A similar process known as the Central Delta Corridor Partnership is underway working with representatives of publically owned and publically financed lands along a corridor that extents from the Northeast Delta through the Central and West Delta. Here the participants are trying to identify challenges to overall economic sustainability and opportunities to restore ecological processes without taking land out of private ownership. Both efforts are relying on real time collaboration and data visualization tools to realize efficiencies and improve planning outcomes. The presentation will describe the processes and lessons learned.

Keywords: Planning, restoration, sustainability, community involvement, collaboration, data visualization

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Speaker Biography: Campbell Ingram became the first Executive Officer of the Sacramento-San Joaquin Delta Conservancy in March of 2011. The Conservancy is tasked with being a lead agency for ecosystem restoration in the Delta and supporting efforts that advance environmental protection and the economic well-being of Delta residents. Previously, Campbell was an Associate Director of The Nature Conservancy's California Water Program where he participated in the Bay-Delta Conservation Plan effort as a Steering Committee member. Campbell previously worked for the U.S. Fish and Wildlife Service where he was responsible for implementing several CVPIA restoration programs and the CALFED Environmental Water Program; and prior to that was employed by the U.S. Bureau of Reclamation working directly for the CALFED Ecosystem Restoration Program.