

Develop processes for increasing carbon sequestration through wetland restoration, creation, and management

Sequester carbon in wetland restoration, enhancement, and creation projects to reverse subsidence of agricultural lands, reduce greenhouse gases in the atmosphere, and advance scientific understanding of carbon sequestration. Focus near-term projects in more subsided locations on conversion to managed wetlands and in less subsided locations on conversion to tidal wetlands. Study and quantify the results in support of global and Californian carbon markets.

TASK 11-1 Work with agencies and willing private land-owners to identify appropriate sites and funding sources, and to plan and implement projects that create managed wetlands on former agricultural lands in the Suisun and Delta region.

BY 2021 Convert 3,000 acres to wetlands in the Suisun and Delta region.

TASK 11-2 Continue to conduct applied research to better understand atmospheric carbon sequestration and storage fluxes in wetlands in the Bay and Delta. Work within reference systems and utilize scenario testing to inform management and restoration approaches. Quantify the greenhouse gas emissions (CO_2 , CH_4 , NO_x) from different types of wetlands and different management regimes.

BY 2021 Complete and publish several (1-3) applied research studies on carbon sequestration, as a product of specific restoration and management approaches.

TASK 11-3 Support the carbon market by completing relevant offset protocols for wetlands and by developing reference sites and standard carbon monitoring and accounting practices that reduce reporting costs for participants.

BY 2021 Completion of relevant offset protocols.

BACKGROUND

Wetlands are important in the global carbon cycle, cycling carbon through plant growth, decomposition, sequestration, and greenhouse gas emissions. Indeed wetlands can be major carbon sinks due to their fast rates of primary productivity, large standing biomass, and tendency to retain carbon as peat. Improving carbon management in wetland restoration, enhancement, and creation projects can prevent further subsidence, increase organic matter accumulation, reduce greenhouse gas emissions, and sequester more carbon. As stated in the 2015 *Baylands Ecosystem Habitat Goals Update*, if tidal marshes in the Bay can grow vertically and migrate laterally with sea-level rise, then they will sequester more carbon. However, if marshes drown and

become unvegetated mudflats, they may lose the ability to produce biomass and store carbon.

Deeply subsided agricultural lands in the Delta slated for habitat restoration present different challenges, however. In the Delta the majority of former wetland acreage now exists as drained, subsided, organic soils up to 25 feet below sea level. Efforts are underway to choose suitable habitat restoration options based on subsidence levels and opportunities to build up biomass. In the interim, research on wetland greenhouse gas biogeochemistry has also been advanced primarily in the Delta.

Testing methods to increase the elevations of former and current wetlands, whether subsided today or drowning in future, is a critical frontier in sea level rise adaptation for this Estuary. Work is ongoing to develop methods and protocols for such efforts to earn carbon credits in global and California markets.

In 2015, the first globally applicable greenhouse gas accounting methodology for coastal wetland restoration was approved by the Verified Carbon Standard. This “Methodology for Tidal Wetland and Seagrass Restoration” will allow ecosystems such as salt marsh, mangroves, and other tidal wetland restoration projects to earn carbon credits.

Also in 2015, a draft proposal for a local application of a new carbon offset methodology, which would quantify emissions reductions for the restoration of Delta wetlands, was submitted to the American Carbon Registry.

These methodologies will inform an initiative under California Eco-Restore, a program of the California Natural Resources Agency, to help coordinate and advance critical habitat restoration in the Sacramento-San Joaquin River Delta over the next four years. California EcoRestore’s initial goal includes creation of 3,500 acres of managed wetlands, specifically for subsidence reversal and carbon management, on Sherman Island and Twitchell Island. Challenges to that goal include finding funding for creation and management.

OWNERS

CA Department of Water Resources (Tasks 11-1, 11-2, 11-3)

Delta Conservancy (Tasks 11-1, 11-3)

SF Bay National Estuarine Research Reserve (Tasks 11-2, 11-3)

COLLABORATING PARTNERS

CA Department of Fish and Wildlife, CA State Coastal Conservancy, Delta Stewardship Council, Los Angeles Metropolitan Water District, Sacramento Municipal Utility District, US Geological Survey, Univ. of California Berkeley, Univ. of California Davis

NEXUS

Actions 3, 4, 16, 18, 24; Goals 1, 2; Objective a, c, d, f