

# WINCHESTER TIDELANDS RESTORATION PROJECT:

## CASE HISTORIES from SOUTH SLOUGH



The South Slough National Estuarine Research Reserve (South Slough NERR) is a 2,000-hectare marine protected area located in the South Slough arm of the Coos estuary on the southern Oregon coast near Charleston. Over the past decade, Reserve staff have engaged in a series of experimental wetland restoration projects to address the need for more information about restoring estuaries in the Northwest. This set of case histories is designed to share concepts, methods, and lessons that have been learned at South Slough NERR with landowners, watershed councils, wetland managers, and other restoration practitioners who may be planning estuarine restoration projects.

## BACKGROUND

Over the past 150 years, natural wetland habitats along the coast of Washington, Oregon, and Northern California have been altered and degraded by land-use changes associated with human activities. In some estuaries, more than three-quarters of the once tidally-inundated marshes have been lost through diking, draining, and filling (NRC 1996; Borde et al. 2003).

This loss is significant because tidal wetlands serve several key functions in natural communities and local economies. Salt marshes provide critical rearing habitat for juvenile crabs and fish, including Pacific salmon, and also contribute nutrients that form the base of estuarine food webs, thus helping to sustain the Northwest's commercial fishing industry (Healey 1982; Holing 1995; Sadro and Miller 2003). More than seventy-five percent of all fish species caught by commercial fishers and sport anglers depend on estuaries at some point in their life cycle (Norse 1993; U.S. EPA 1995). Tidal wetlands also serve as habitat for numerous invertebrates, wading birds, and other wildlife

(Reinert and Mello 1995). In addition, salt marshes protect human communities by buffering the land from storms and floods and helping to maintain water quality (Valiela 2004).

With economic changes over the past 40 years, many converted wetlands have fallen out of agricultural use. During the same period, scientists have come to better understand the many important functions of natural tidal wetlands.

These intersecting trends present an opportunity to restore some lost functions to estuarine wetlands. In many cases, public agencies working together with private citizens, watershed councils, and large and small landowners have already begun to restore degraded tidal habitats by re-establishing tidal flows.

When land managers begin planning for estuarine restoration, they must choose a restoration strategy. While passive strategies, such as simply removing tide gates or even breaching dikes, are least costly, they take many years to achieve recovery of wetland functions and may not result in restoration of all



functions (Williams and Orr 2002). With the decline of Pacific salmon runs, the need to accelerate restoration of all tidal marsh functions has taken on greater urgency (Healey 1982; Myers and Horton 1982; IMST 2002), and wetland managers have become more interested in active restoration strategies.

To respond to the need for better, more region-specific information, the South Slough NERR began a multi-phase study in 1993, the Winchester Tidelands Restoration Project (WTRP), to determine how best to restore lost ecosystem functions to degraded wetlands.

South Slough NERR was established in 1974 as the first site in the National Estuarine Research Reserve System, a federal-state program created under the Coastal Zone Management Act of 1972 to promote informed management of the nation's estuaries. South Slough is now one of 26 National Estuarine Research Reserves around the country that conduct long-term research on the issues specific to each region's estuaries. Managed jointly by the Oregon Department of State Lands (DSL) and the National Oceanic and Atmospheric Administration (NOAA), the South Slough NERR has worked to improve the management and stewardship of Northwest estuaries and coastal watersheds through research and education.

## WINCHESTER TIDELANDS RESTORATION PROJECT (WTRP)

The Winchester Tidelands is an area within the South Slough NERR representative of converted and degraded tidal wetlands throughout coastal Oregon and northern California. In 1993, South Slough staff assembled an advisory group of specialists in restoration and estuarine ecology, tidal hydrology, fish biology, program development, project engineering, and permitting to help design a multi-phase project to test the effectiveness of a variety of restoration methods. WTRP Advisory Group members came from universities, state and federal agencies, non-profit organizations including watershed associations, and from private consulting firms.

As Reserve staff began to plan for restoration, they faced two fundamental questions: What ecological functions did natural tidal wetlands in the South Slough estuary serve that the Reserve's diked wetlands did not? And what structural characteristics of the undiked ("natural") marshes influenced their functions? To answer these questions, Reserve staff collected information about the diked and undiked marshes in the South Slough estuary. They researched site histories, analyzed baseline vegetation and invertebrate community data collected in 1992 and 1993 as part of the Reserve's Site Profile (Rumrill, S. in press), and measured marsh surface elevations using topographic surveying methods.

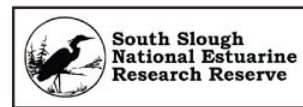
With the assistance of the WTRP Advisory Group, Reserve staff designed several experimental projects intended to improve understanding of methods to restore tidal marshes. At Kunz Marsh, Reserve staff and partners investigated how to address marsh surface subsidence. At Cox Marsh, Dalton

Creek, and Fredrickson Marsh, they investigated methods for restoring, constructing, and enhancing tidal channels. At Anderson Creek, they examined techniques for constructing a non-tidal stream channel and restoring associated floodplain hydrology. Reserve staff applied information learned at the first restoration sites as they planned and executed subsequent projects.

This series of case histories examines five ongoing restoration projects, explaining how each was planned, what methods were used, what results were obtained, and in the end, what lessons were learned that could help others in the critical work of tidal wetland restoration.

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