Why Restore?

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HABITAT DESTRUCTION AND DEGRADATION are among our most serious environmental crises, causing species extinctions and threatening many remaining wildlife populations around the world. In California, population growth and associated coastal development have caused the loss of over 90 percent of our wetlands. Although the passage of environmental laws in the 1970s, including the California Coastal Act, has helped to slow this decline, many remaining wetlands continue to be threatened by development and are degraded by poor water quality, invasive species, and other threats. In addition to making sure that no more loss occurs, an important new challenge is to restore wetlands and other critical habitat wherever feasible. This guide describes how citizens can become involved in helping to improve and restore coastal wetlands and other coastal habitat in their communities.

The California Coastal Commission's Community-Based Restoration and Education Program

In 1972, the citizens of California passed Proposition 20, known as the "Save the Coast" initiative, which called for the formation of a statewide planning and regulatory agency named the California Coastal Zone Conservation Commission. Made permanent by the 1976 Coastal Act, and now known as the California Coastal Commission, the Commission has spent the past 30 years working to preserve and protect the resources of our 1,100 miles of coastline. The Commission's Public Education Program complements the work of its regulatory and planning programs by empowering the public to become stewards of our coast and ocean and take environmentally positive action. Participating in hands-on habitat restoration is one of the ways in which the public can be involved in helping to protect the coast.

Restoration is . . .

". . . turning back the clock to a time of pre-disturbance ecology." —JOY ZEDLER

". . . raising the ecological function of a degraded site." —DANIEL JANZEN

". . . assisting the recovery of an ecosystem that has been damaged." —SOCIETY FOR ECOLOGICAL RESTORATION

In 2002, the Coastal Commission, working with the Tides Center, a San Francisco-based non-profit organization, developed a habitat restoration program called the Community-Based Restoration and Education Program. Our pilot program, known as "ROOTS," is located at Upper Newport Bay in Orange County, southern California's largest estuary. ROOTS is a team effort involving the state Department of Fish and Game, Orange County, the City of Newport Beach, the Newport Bay Naturalists and Friends, and other organizations. The Restoration and Education Program coordinates monthly field days and weekly greenhouse work for volunteers. Beginning with a basic plan for restoration of three to four major sites around the Bay, the Program quickly grew to eight separate sites and has so far restored over 12 acres of coastal sage scrub, salt marsh, and riparian habitats. Over 4,000 volunteers have devoted more than 25,000 hours to this effort. To date, they have removed about 100 tons of invasives, and cultivated and planted 12,000 native plants. Recently, the Program developed a complementary high school curriculum, *Our Wetlands, Our World*, to help teachers meet state educational content standards with activities that bring the Bay into the classrooms and hearts of students. (Visit **www.coast4u.org** for a free download.). This Guide is an outgrowth of our work at Upper Newport Bay, incorporating the lessons learned along the way.

The Value and Limits of Ecological Restoration

Ecological restoration is an evolving field, and as such, its definition is debated. For our purposes, ecological restoration is defined as an intentional activity that pilots a damaged site towards recovery and sustainable ecological function. Clearly, restoration is no substitute for preservation. It may not be possible to replicate historic functions and values, and the activities of ecological restoration—disking soil, using chemicals to remove exotics, irrigating—can further strain an already stressed ecosystem. However, in many situations, ecological restoration can improve habitat value and ecosystem functions. Ecological restoration is also valuable for the links it forms between huma ns and nature. Ecological restoration can help build a long-term commitment between a natural place and the community that surrounds it.

The majority of restoration efforts occur on disturbed and degraded landscapes. Humans have been "disturbing" biology and land for over 10,000 years. Fortunately, relics of ecosystems with varying degrees of disturbance still exist, as there remains great value in partially disturbed

land. Even small, isolated habitats should not be overlooked for the opportunities they afford; habitat patches are vital to migrating birds and other wildlife, for example. The value of habitat patches that act as corridors and linkages, and the role these linkages play in the survival of populations, is only beginning to be fully understood by ecologists. Sadly, however, there are some places that are beyond restoration due to challenges such as isolation from functioning ecosystems or inadequate soils.

mportance of Wetlands

"Wetland" is a broad term used to describe areas where, at least some of the time, water saturates the soil, and which display characteristic soil and vegetation types. These habitats are among the most productive ecosystems on earth—an immense variety of microbes, plants, insects, amphibians, reptiles, birds, fish, and mammals needs wetlands for part or all of the lifecycle. According to the U.S. Environmental Protection Agency, more than one-third of United States' threatened and endangered species live only in wetlands, and nearly half use wetlands at some point in their lives. Wetlands benefit both freshwater and marine fisheries by providing spawning and rearing habitats and food supply. Waterfowl migrating along the Pacific Flyway depend on California wetlands for critical wintering habitat. Wetlands also serve vital hydrological functions, buffering wave erosion, reducing flooding by storing large volumes of water, and filtering toxic run-off.

Yet only ten percent of California's wetlands remain, and many of these last existing patches are degraded or threatened by human activities. The term "wetland" was not coined until the 1950s. Prior to that, these lands were known as "swamps" and were largely considered nuisance lands—in need of being converted to "useful" purposes. It was not until the 1970s that environmental laws such as the Clean Water Act reined in the wholesale destruction of wetlands for shopping centers, homes, and farmland. In southern California, most of our remaining coastal wetlands are hydrologically constrained by railroads and roads. Upland buffers, which filter sediment, provide habitat, and protect wetlands from human and animal use, have been eliminated or are degraded by invasive plants. Many of the waterways that feed into

PHOTO: MARK WARMERDAM

Wetlands at Point Reyes National Seashore

wetlands are polluted by urban waste and pesticides, heavy metals, and high bacteria counts. Other threats included lack of freshwater inputs due to dams, sedimentation caused by upstream and bordering development, and destruction caused by overuse or disturbance and trampling by humans and animals.

Purpose and Scope of this Guide

While there are many types of coastal habitats in California, the focus of this guide is on wetlands and their associated transitional and upland habitats, which buffer the impact of surrounding developed zones and have intrinsic habitat value as part of the wetland ecosystem. Examples of habitats that fit well into the compass of this guide are marshes, coastal sage scrub, grassland, creeks and riparian corridors.

The purpose of this guide is to assist inspired individuals and organizations in undertaking community-based habitat restoration projects, and to help maximize the success of these projects. The guide is designed for people who seek to develop new programs, but may also be helpful in expanding or improving an existing program. The guide explains, in easy-to-follow instructions, the basic steps of information gathering, site selection, team building, project implementation, monitoring, maintenance, and working with volunteers. Also included are tips on battling non-natives, as well as propagating and installing native plants. While this guide is focused on the Commission's experiences in marshes, creeks, and coastal sage scrub communities, we reference several other coastal habitat types as well.

The guide provides insight into how to develop a coastal habitat restoration project that can be undertaken with volunteer labor, with direction towards additional resources where needed. It is not intended to provide enough technical information for you to complete a restoration project through the use of this guide alone. Each restoration site is going to have particular issues and design considerations that cannot be addressed through a generic guide. Depending on the scope of your project, you may need to hire outside expertise to develop a restoration plan for your specific project. If this is the case, this guide will help you to work with your expert(s) as a partner, providing critical information and input.

We hope that this guide will help you develop and maintain a successful community-based habitat restoration program, and in the process help to restore our remaining coastal wetlands to places of vitality and beauty.