



Figure 1. This nonnative coastal mountain grassland at Santa Monica Mountains National Recreation Area in southern California comprised the southern portion of the 32-acre site chosen for riparian vegetation restoration. The lone mature sycamore, one of the few remaining native plants, may soon be joined by other native trees, shrubs, herbs, and grasses planted by more than 250 people along the base of Boney Ridge (background) in the Potrero Creek restoration project.

PARTNERSHIPS IN RESOURCE MANAGEMENT: The Potrero Creek Restoration Project

BY ROSE M. RUMBALL-PETRE

PARK PARTNERSHIPS AND INTER-AGENCY cooperation are essential ingredients in conducting successful projects in the Santa Monica Mountains National Recreation Area in southern California. Unlike most national parks, we will never own all, or even most, of the land within the boundary. Rather, the park demonstrates a cooperative effort itself, where the lands of private citizens and local, state, and federal governments mesh. Therefore, conducting park projects in a broad context of openness and cooperation is critical. Engendering community support for the park is essential to preserving its resources.

BACKGROUND

Community support for the park paid big dividends last year when area cooperators helped to revegetate the Potrero Creek drainage following severe wildfires. Planning for the Potrero Creek Restoration Project began when, in the aftermath of the fall 1993 fires, Kraft General Foods, Inc., donated \$10,000 through the National Park Foundation for revegetation.

However, since the National Park Service does not routinely revegetate after wildfires, we chose to use the grant for a high priority riparian restoration project, consistent with the development concept plan for Rancho Sierra Vista/Satwiwa (1984) and acceptable to Kraft as an alternative. This area was one of the first burned by the 1993 Greenmeadow fire, which burned over 38,000 acres within the park.

Potrero Creek traverses a highly disturbed grassland at the base of Boney Ridge in the western end of the Santa Monica Mountains (fig. 1). Beginning around the turn of the century, well before NPS management, the restoration area was the site of a large cattle and sheep ranch; later, a citrus farm prevailed; and still later, during NPS management, the tract served as a dryland farm that partially supported a local college agricultural program through a cooperative agreement. These activities, including removal of large oaks and sycamores in support of historic ranching and farming, left Potrero Creek with little native vegetation regeneration. The development concept plan for the area and the park resource management plan both pre-

scribed native vegetation restoration, especially in riparian areas, as a high priority. The wildfires prompted funding, helped us rally support, and moved us to plan for this cooperative revegetation project.

PLANNING

Initial planning and research for the project entailed publicizing the grant from the National Park Foundation and contacting a variety of individuals and agencies for information regarding similar restoration projects. We incorporated this information into a detailed restoration plan that adopted recommendations of other existing area plans to place a 400-foot riparian buffer along Potrero Creek through the dryland farming zone.

The Potrero Creek Restoration Plan describes the need for restoration and discusses the overall and site-related importance of riparian restoration. The document also analyzes the proposed restoration area in terms of its physical and biological site characteristics (soil, topography, hydrology, existing vegetation, succession, wildlife use). Finally, it identifies

planning considerations and the goals and objectives for the project, based on research into the successes and failures of riparian restoration projects conducted throughout the west. In addition, the res-

ciates, Coast Irrigation, Inc., and Tree of Life Wholesale Nursery provided valuable comments during the planning process; some even assisted in implementation.

dividuals and community organizations that supported the project, including TreePeople, Tree of Life Nursery, the Malibu Forestry Unit (nursery) of the L.A.

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toration plan presents monitoring data from a reference site and describes the implications of the project site characteristics on implementation.

We analyzed aerial photos and selected similar sites for use as reference areas to determine the project boundary, implementation strategy, existing plant species, planting density, and planting zonation. Finally, to develop a planting plan, we prepared a detailed site map, selected an irrigation system, and designed a monitoring program that would address the overall restoration project goals and objectives. Table 1 shows the native species we chose to plant in the restoration project.

Throughout the restoration plan literature citations of documented riparian restoration projects refer to actual implementation objectives, such as whether or not to mulch, what planting density to use with walnuts, the depth to achieve when augering holes, etc. However, little information was available on the success and failure of riparian restoration efforts. As a result, we engaged in great debates over whether or not to fertilize the plants. Lacking consensus, we decided to test the need for fertilization through this project.

The overall project area encompasses a potential of 32.2 acres (13 hectares), of which approximately 13.8 acres (5.6 hectares [1,500 x 400 ft]) have been restored. We augered holes, set up a fertilization test, and installed a drip irrigation system for 1,020 plants of seven riparian species and two coastal sage scrub affiliates. In the end, the California Department of Parks and Recreation, Topanga-Las Virgenes Resource Conservation District, City of Malibu, California Department of Fish and Game, NPS Western Regional Office, Channel Islands National Park, TreePeople, James H. Cowan and Asso-

FUNDING AND DONATIONS

One of the first contacts we had with a cooperator who would help us carry out the restoration occurred even before we received the NPF grant. TreePeople, a local tree-planting activist organization, had approached us following the fall 1993 wildfires to offer assistance in planting trees in the park. Although Potrero Creek was evaluated for an initial cooperative venture, it was not selected because it lacked a restoration plan. Instead, we cooperated to revegetate Happy Hollow Campground and replaced nonnative trees, killed by the wildfires, with native trees and shrubs.

While waiting for the grant and developing the restoration plan for Potrero Creek, we also sought additional funding and support for the project through donations. Regular conversations with interested park and interagency staff led to over \$45,000 in donations of materials and volunteer time (calculated at \$7.50/hour, essentially a GS-3 wage), which more than quadrupled the original donation. TreePeople set aside money and contracted staff time in anticipation of the project, and when we received the NPF grant, their interest escalated.

The NPF grant was used to purchase materials and supplies to prepare for the planting date and the temporary drip irrigation system. Remaining grant funds are being used to pay for 2 years of dry-season watering. The bulk of the project, however, was implemented as the result of donations from the huge variety of in-

County Fire Department, several local tree trimming businesses, and many others.

PLANTING AND MONITORING

The fall planting date attracted an all-time record turnout for a volunteer event in the park, gathering over 250 participants from a variety of Los Angeles and

TABLE 1. NATIVE VEGETATION PLANTED AT THE POTRERO CREEK RESTORATION PROJECT SITE

Trees

California black walnut	<i>Juglans californica</i>
Western sycamore	<i>Platanus racemosa</i>
Coast live oak	<i>Quercus agrifolia</i>
Valley oak	<i>Quercus lobata</i>

Shrubs & Subshrubs

California sagebrush	<i>Artemisia californica</i>
Coyote bush	<i>Baccharis pilularis</i>
Mule fat	<i>Baccharis glutinosa (salicifolia)</i>
Purple sage	<i>Salvia leucophylla</i>
Wild rose	<i>Rosa californica</i>
Mexican elderberry	<i>Sambucus mexicana</i>

Grasses, Sedges, Rushes

Creeping wildrye	<i>Elymus triticoides</i>
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Ventura County community organizations, such as the Roosevelt High School Ecology Club, the Los Angeles Junior Chamber of Commerce, and a number of scout groups. The largest single "group" of individuals participating in the project, however, were volunteers from the neighborhoods bordering the restoration site.

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The first phase of monitoring is nearing completion. Plant growth and survival has been extremely variable, with elderberries (*Sambucus mexicana*) sustaining a 71% mortality rate, but with individuals attaining the greatest growth, with a range of 13.7-76.9 in (35.1-197.2 cm) and stem diameters of greater than 1.4 in (3.6 cm). Sycamores (*Platanus racemosa*) on the other hand, had an initial survival of 90% but attained virtually no additional height (range 2.3-40.6 in [5.9-104.1 cm]) due to a widespread fungus infestation that caused the trees to die back after early spring growth and then resprout from the base, with varying vigor. Wild rose (*Rosa californica*) has had an 85% survival rate, and has attained heights ranging from 5.9-51.5 in (15.1-132.1 cm), with a large number, like the surviving elderberries, also producing both flowers and seeds (fig 2). Live oaks (*Quercus agrifolia*) and valley oaks (*Q. lobata*) had survival rates of 78% and 62%, respectively, with height ranges of 3.3-40.6 in (8.5 cm-104.1 cm) and 5.1-55.4 in (13.1-142.1 cm), respectively.

Ongoing maintenance of the drip irrigation system will be required for at least 2 years to ensure plant establishment. Monitoring of the project will continue indefinitely, occurring at least annually, in the spring. Additional monitoring of a reference plot in the project area, weeding and alien plant removal, site maintenance, removal of cages and, possibly, follow-up planting will also occur as needed.

Visitors and park neighbors passing adjacent to the project area on Potrero Road, may still see multicolored landscaping flags denoting the wide variety of plants and ongoing efforts of park staff and volunteers to monitor the plants and to main-

tain the irrigation system. The wide, mowed field with huge truckload-sized piles of mulch is now gone and once again offers its previously disturbed appearance. However, upon closer inspection, the native vegetation has returned at irregular intervals. With continued care these plants will dominate the now nonnative landscape of the restoration area.

CONCLUSION

The total cost for the project to date is \$63,149 of which more than 70% (\$45,552) has come from donations or volunteer time. Much of the rest can be attributed to staff time spent on developing the restoration plan, augering holes, coordinating planting, maintaining the irrigation system, and monitoring. Without the thoroughly researched restoration plan, the willingness of park staff to participate in the project, and the excellent cooperative relationships established through informal connections, this project would not have been possible.

The "devastation" caused by the Greenmeadow fire was put to rights in the minds of park neighbors and volunteers by focusing on repairing the real devastation caused to a native community by years of insensitive land use. An idea, a little seed money, and numerous partnerships created the Potrero Creek restoration project, which, if all goes well, will fulfill the park enabling legislation to "enhance" the natural resources of the Santa Monica Mountains for decades to come.

PS



Figure 2. One of the many shrubs planted, wild rose (*Rosa californica*) has had an 85% success rate with some individuals flowering, going to seed, and reaching 52 inches in height. A drip irrigation system will water the new plants for at least two years to help them become established.

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