

SITE STABILIZATION THROUGH REVEGETATION

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ABSTRACT

Site LAN-52, a shell midden rich in cultural remains, is located on a coastal bluff in Leo Carrillo State Beach. This bluff has been a popular beach access point for many years. A multiyear revegetation program was successfully implemented at LAN-52. The program involved a study of past archaeological research; in-filling vandal holes; collecting, growing, and planting local coastal sage scrub plants; establishing a temporary irrigation system; and weeding. The revegetation work has stabilized and protected the site deposits, while appreciably enhancing the native plant community on the bluff.

INTRODUCTION

Revegetation is a restorative process which reintroduces ecologically-appropriate plants, in particular, local native flora, onto a damaged landscape. Desired results of any revegetation project include a renewed ecological health for the project area, and an area stabilized against future forces of damage. Such results are appropriate whether they occur upon an archaeological site or other location. Forces creating damage can take the form of natural weathering and erosion (wind, rain, sheetwash, fluvial, etc.), pothunting, foot or vehicular traffic, and others.

Archaeological sites throughout much of the United States have been covered with some form of vegetation since they were abandoned by their original inhabitants. The reintroduction of local native plants inherently does not intrude onto the natural setting of a site or its environs. Revegetation has been employed as a site stabilization technique on various sites throughout the United States, including some major mound groups in the Midwest and Southeast, such as

Cahokia, Emerald, Pharr, Winterville, and others (Thorne 1990:1). Staff of the California Department of Parks and Recreation (DPR) have conducted revegetation work on archaeological sites around the state.

Revegetation as a restoration and site stabilization tool has numerous benefits:

- (1) It is one of the least visually intrusive stabilization techniques available.
- (2) Revegetation is ecologically sound, and enhances the natural aesthetics of a site.
- (3) It enhances wildlife habitats.
- (4) Vegetation effectively slows the energy of wind and water, i.e., forces which potentially create appreciable on-site erosion. Soils are strengthened and reinforced by plant roots (Thorne 1990:1-2).
- (5) Plants adapt or can be placed within a wide variety of topographic features and environmental conditions.

- (6) Once established, local native plants require little to no maintenance.
- (7) Vegetation helps hide or obscure cultural remains.
- (8) The organic matter content of a site should not be affected appreciably assuming a plant cover previously existed on-site (Thorne 1990: 4-5).
- (9) Revegetation is probably the least expensive site stabilization technique available (cf. Thorne 1990:6).

THE PROJECT

Techniques of revegetation will be illustrated through a discussion of work under my direction at Leo Carrillo State Beach. Leo Carrillo State Beach, with over 2,000 acres of land, is located in the extreme northwestern portion of Los Angeles County, and lies 20 miles downcoast from Oxnard. Site LAN-52 is situated upon a bluff overlooking the Pacific Ocean within the park. The Pacific Coast Highway (State Highway 1) bisects the site on an east-west axis, i.e., downcoast-upcoast. Arroyo Sequit flows into the ocean adjacent to the west end of LAN-52.

The cultural deposits of LAN-52 are dark grey, loose, silty sands containing artifacts, abundant rounded rocks, and ecofactual matter (bone and shell). On the south (or ocean) side of Highway 1, the site measures 274 meters east-west by 39 meters north-south. A remnant of cultural deposits occurs on the north side of the highway.

Site LAN-52 has been the subject of several archaeological investigations of varying scope. The Museum of the American Indian, Heye Foundation reportedly collected from the site between 1939 and 1944 (Burnett 1944:16-18, various plates; Curtis 1959:103-109). The Archaeological Survey Association of Southern California dug at LAN-52 in 1951; most units were at the west end of the site. A field methods

class from the University of California, Los Angeles excavated here in 1954; most work took place in the west end. Freddie Curtis (1959) reported upon these latter two projects. Freddie Curtis directed excavations here in 1960 and 1962 for State Parks (Curtis 1963). Some minor field-work was conducted at LAN-52 in the mid-1960s by University of California, Los Angeles graduate students.

We began work at LAN-52 in 1987 by defining where archaeological excavations had occurred, and where we could identify evidence of site vandalism. The numerous vandals' holes found on-site were measured, and a sample of cultural materials recovered from the backdirt of these holes. The holes were then filled-in. Individuals who had worked on the early studies of LAN-52, including William and Edith Wallace, George Kritzman, Charles Rozaire, and Freddie Curtis, were asked to participate or comment upon our work (Sampson 1987).

Site LAN-52 is situated at an exceedingly popular beach park. The beach area in front of the site is particularly well known as an excellent surfing location, and, at certain times, a great spot for windsurfing. People also come here just to use the beach, and to view the tidepools. A popular pattern of beach access has always been to park along Pacific Coast Highway, and then walk across the west end of LAN-52. The bluff top on-site which adjoins the highway had been an area to view the surf conditions, and ready surfing equipment. The west end of LAN-52 was largely denuded at the start of the project; two sizable gullies had been worn into the bluff face.

Revegetation would never work until beach access was controlled. A staircase was built over the west end of LAN-52 in 1987. A fence was added along Pacific Coast Highway at the same time to discourage cutting across the site.

The areas of the coastal bluff site denuded by foot traffic and pothunting incidents has been the focus of the present revegetation project. The principal objective of our work involved the

reintroduction of viable, local native plants at the western end of LAN-52, and their maintenance. The vegetation community on and surrounding the site may be characterized as coastal sage scrub. Some of the more common plants found here include California sagebrush (*Artemisia californica*), bladderpod (*Cleome isomeris*), California encelia (*Encelia californica*), mulefat (*Baccharis glutinosa*), coyote brush (*Baccharis pilularis*), coastal prickly-pear cactus (*Opuntia littoralis*), and others (plant identifications by California Fish and Game Plant Ecologist James Dice). Coastal sage scrub is a drought-deciduous Mediterranean shrubland community characterized by soft-leaved, aromatic shrubs, usually 0.5 meter to 2 meters tall. Plant growth occurs in late winter and spring following winter rains (Raven et al. 1986:10). Coastal sage scrub is considered an endangered plant community in California (O'Leary 1989).

A DPR botanist and other local botanists identified plant species which would be appropriate for revegetation here. We identified the correct times to gather seeds using local flora reference books (Raven et al. 1986; and others) and consultations with local experts. Seed gathering efforts began on-site in Spring 1989 by myself and others. Among revegetation practitioners, it is standard procedure to only collect among local plants; conservation of local plant gene pools is critical. This practice is mandated by departmental policy in the State Park System. Local botanists should designate what constitutes a "local plant population".

A contract to accomplish the LAN-52 revegetation work was awarded to the Topanga-Las Virgenes Resource Conservation District, a local non-profit educational organization. This group has specialists on staff with considerable experience in revegetation work in the Santa Monica Mountains. One of their botanists formulated the planting scheme for LAN-52.

A temporary irrigation system was established on the revegetation plot to assure the survival of new plantings. A rotary type sprinkler manufac-

tured by Raindrip, Inc., was employed; their layout on the site was a joint effort of consultant and a DPR maintenance person. The irrigation system was placed to assure adequate coverage of bare areas on the bluff top and bluff face. The watering schedule for the project was devised to simulate a "regular rainfall pattern", with adjustments for rain or Santa Ana weather conditions. Most often, the sprinklers would be turned on every 10 days. DPR staff at Leo Carrillo State Beach made repairs to the system (primarily replacing broken sprinklers) as needed.

The Resource Conservation District staff gathered seed and cuttings, as available; grew the seedlings; and established them on-site. The seedlings were grown by a local restoration specialist at his own nursery, using deep pot inserts and collars manufactured by McConkey Company of Garden Grove, California. The seeds were grown in a soil medium created by McConkey. The contractor successfully encouraged transplants of cuttings of various plants to grow at site LAN-52, including mulefat, coastal prickly-pear cactus, ashy leaf buckwheat (*Eriogonum cinereum*), and coast goldenbush (*Haplopappus ventus*). (California has numerous native plant nurseries, seed companies, and restoration consultants who will gather seed, grow them, and plant and maintain the plants.)

DISCUSSION

The revegetation efforts at the west end of site LAN-52 have been successful. The dense growth of plants present on-site today represents a striking contrast to the denuded appearance of the bluff prior to 1989. Plants are thriving in large part due to the well-conceived, well-maintained irrigation system, and the care given the plants by the contractor and by local park staff. Regular waterings on LAN-52 have assured good survival rates for introduced plants, and stimulated the growth of existing seed stock and shrubs. The "care" I allude to includes planting, transplanting, introducing cuttings, watering, and weeding exotic plants. The contractor replanted spots trampled

by beach-goers, and replaced plants torn out during a pothunting incident.

Another key element to successful revegetation here has been the control of people, through use of the staircase and fencing. The large volume of people who use the beach near LAN-52 made it critical to actively manage beach access by such means. Surfers and many other types of beach users largely ignore signs, and choose expeditious routes to the water. The staircase has made beach access easy and safe.

The discussion of our revegetation efforts at LAN-52 provides a good overview of the key elements in a successful restoration program. I was fortunate in working with biologists who have completed many revegetation projects. The plants are stabilizing the relatively loose midden deposits of site LAN-52. The dense growth of shrubs represents an excellent cover for the conspicuous shell midden deposits.

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