CASE STUDY

Restoring Ethnographic Landscapes and Natural Elements in Redwood National Park

by Stephen Underwood, Leonel Arguello and Nelson Siefkin

The story of restoring Redwood National Park's Bald Hills and oak woodlands rests heavily upon an understanding of Native American land management.

National Park Service resource managers throughout the country are increasingly struggling with what appear to be contradictory philosophies about managing vegetation. That National Park officials have interpreted the National Park Service's enabling legislation to mean that parks should be maintained in their natural condition may be due to the fact that the Yellowstone Park Act of 1872, and the acts creating many of the first National Parks, called for the retention of those sites in their *natural condition*, although "natural" was not defined (Sellars 1997). The lack of a comprehensive definition of "natural" has allowed different park managers to manage similar situations in different ways. The situation becomes even more complex when ethnographic landscapes, archeological sites, and cultural landscapes are overlaid or interspersed within a "natural" area.

The Bald Hills of Redwood National Park are just such a complex area, containing a mixture of natural and cultural resources. In 1828, when trapper and explorer Jedediah Smith traveled through Chilula Indian territory in the Bald Hills, he is thought to have camped at Gans Prairie where he noted in his logbook that he could see the Pacific Ocean. In 1970, the Pacific Ocean was still visible from this location, but today Douglas-fir (*Pseudotsuga menziesii*) encroachment into the prairie obstructs any ocean view and exotic grasses, forbs, and shrubs threaten to dominate the remaining grassland. The loss of historic and ethnographic landscapes, grasslands, oak woodlands, and other natural resources is indicative of the problems faced in managing an area as complex as the Bald Hills.

Natural and Cultural Aspects of the Bald Hills

The Bald Hills area of Redwood National Park lies between the Klamath River and Redwood Creek in northwest California (Figure 1). The area covers about 4,200 acres (1,700 ha) and includes elevations from 250 feet (76 m) to 3,100 feet (945 m). Portions of the Bald Hills were added to Redwood National Park in 1978 when the park was expanded, and again in 1991 with the addition of the upper Coyote Creek drainage. The coastal grasslands (locally called prairies) and oak woodlands generally cover the ridge tops (Figure 2). Poorly drained Xeralf soils, which are found in some areas, resist colonization by Douglas-fir, but most areas have Umbrept soils that are subject to Douglas-fir encroachment (Gordon 1980).

It is difficult to reconstruct the vegetation composition of the Bald Hills prior to the arrival of Native Americans in the region since pollen studies provide infor-

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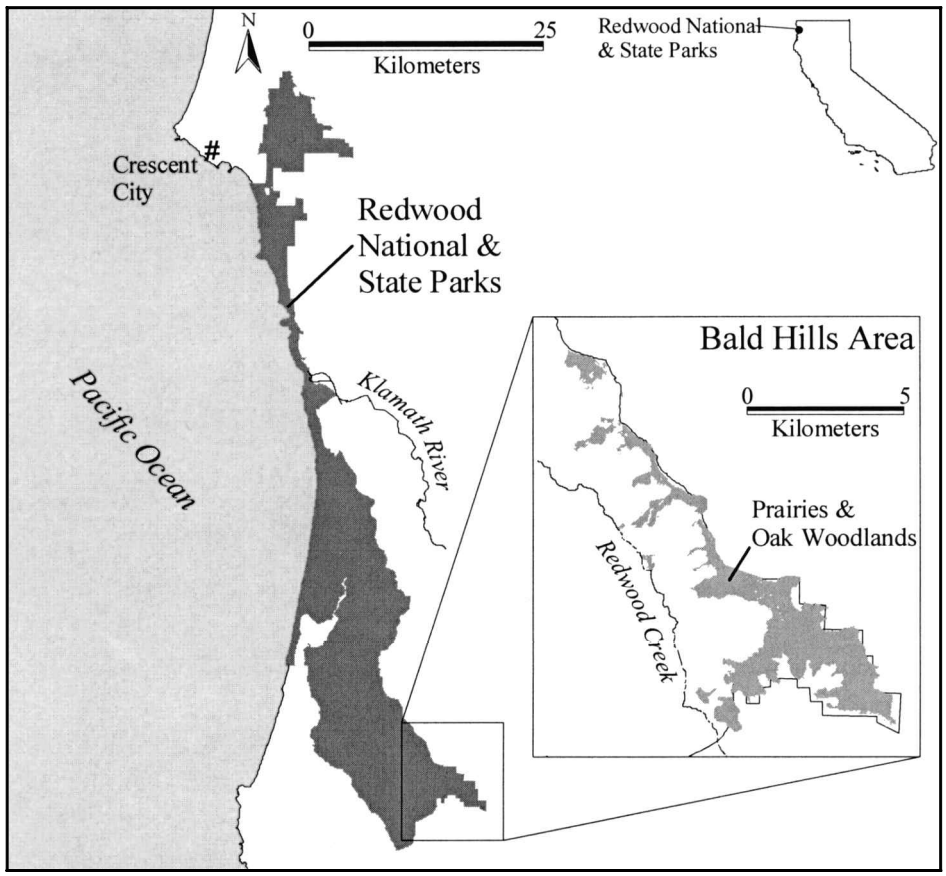

Figure 1. Map of Redwood National and State Parks with insert showing location Bald Hills Area.

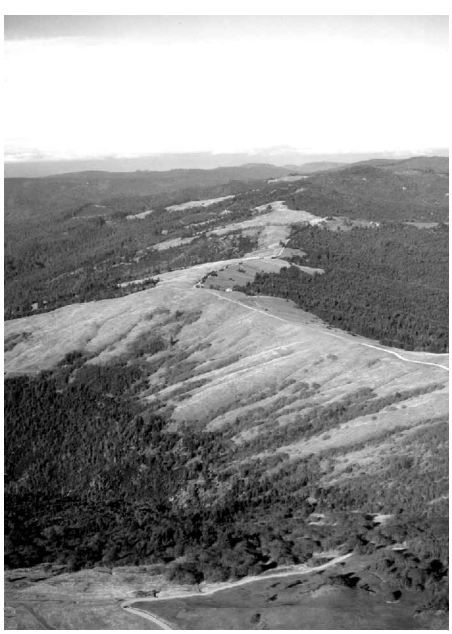

Figure 2. The Bald Hills. Note the location of prairies and woodlands along the ridge tops. *Photo courtesy of Stephen Underwood*

mation for only about the last 5,000 years (West 1983), which approximates the time of human occupation of northwestern California. Using available information, park managers believe that prairies and oak woodlands existed in the Bald Hills prior to the arrival of Native Americans, although their extent and distribution is unknown. During the time Native Americans inhabited the Bald Hills, park botanists believe that more than 190 different vascular plant species were found in the grasslands, including bunchgrasses consisting of *Danthonia, Stipa, Melica, Poa,* and *Festuca* species (National Park Service 1992). It is likely that Oregon white oak (*Quercus garryana*) was the most common oak, with dispersed California black oak (*Q. kelloggii*) along with California bay (*Umbellularia californica*), big-leaf maple (*Acer macrophyllum*), tanbark oak (*Lithocarpus densiflorus*), and other less dominate species completing the forest composition. Historical accounts indicate that Roosevelt elk (*Cervus elaphus roosevelti*) were numerous in the Bald Hills and black-tailed deer (*Odocoileus hemionus columbianus*) were observed.

At the time of Native American-European contact, at least two ethnic Native American groups—the Chilula and the Yurok—used the Bald Hills. The Chilula, speakers of a language in the Athapascan language family, occupied the middle reaches of Redwood Creek, including substantial areas in the Bald Hills. On the basis of linguistic evidence, the Chilula and their closely related neighbors, the Hupa, are believed to have arrived in the region about 700 years ago (Whistler 1979). In the early 1900s, Chilula people identified several villages, temporary camps, and spiritual sites in the Bald Hills (Goddard 1914), a number of which have extant archaeological components (Bickel 1979). With the discovery of gold on the Trinity River, miners established a major supply line (the Trinidad Trail) connecting the diggings with the Pacific Coast through the Bald Hills in 1850. This led to several bloody skirmishes and the eventual displacement of the Chilula from their ancestral lands (Bearss 1969). A number of contemporary Native Americans can trace their ancestry to the Chilula, although the group itself is no longer an extant tribal entity.

The Yurok, who spoke an Algic language, resided primarily in villages along the rugged Pacific Coast and lower reaches of the Klamath River (Waterman 1920). Anthropologists suggest that the Yurok arrived in the region 1,050 years ago (Whistler 1979). Some Yurok traveled seasonally to the lower portions of the Bald Hills to procure available resources such as grass seeds, basketry materials, acorns, and large mammals. Gans Prairie was an important Yurok destination, and several contemporary tribal members fondly recall family trips to the area in the early- and mid-1900s.

Both the Chilula and Yurok followed a hunter-gatherer subsistence pattern, relying on a diverse array of natural resources (Goddard 1914, Waterman 1920). This is not to say that inhabitants of the Bald Hills were at the mercy of the vagaries of natural plant and animal population cycles. It is well documented that Native Americans of northwestern California

engaged in a variety of management practices intended to enhance the abundance and/or quality of desired species (Lewis 1993, Gates and others 2002). For example, they routinely burned and then pruned hazel trees (*Corylus cornuta* var. *californica*) to improve the straightness and strength of shoots used in the construction of various implements (O'Neal 1932, Schenck and Gifford 1952). They also regularly burned the understory of productive groves of oak trees, especially tanbark oak, to inhibit the encroachment of conifers, facilitate acorn harvest, and reduce pest and disease problems (Lewis 1993). It is interesting to note that tanbark oak are extremely sensitive to fire, with even the largest trees susceptible to injury or mortality from low intensity burning (United States Forest Service 2003). Discrete groves of very large, and presumably even-aged, tanbark oak can still be found in the Bald Hills, some with associated archaeological components, such as temporary campsites. Native American management practices probably helped to create and maintain these groves, which, in many respects, share similarities to modern-day, intensively managed agricultural orchards (see figure 3).

Figure 3. Crews restoring indigenous-style fire regimes in a fire yard at Gans Prairie, where many years of burning have protected tanbark oak (*Lithocarpus densiflorus*) trees and increased the amount of acorns available for collecting. *Photo courtesy of Stephen Underwood*

In a seminal study of Native American burning practices in northwestern California, anthropologist Henry Lewis (1993) recognized two cultural landscape phenomena related to intentional burning: *fire yards*, openings or clearings within a forested area that are maintained by burning, and *fire corridors*, the fringes of ridges, trails and other linear features that are similarly maintained by fire. Fire yards attracted large game and yielded a greater abundance and diversity of economically important plants than the surrounding forest. Burning along fire corridors was done to facilitate travel and improve resource abundance and predictability in time and space. The prairies of the Bald Hills are excellent examples of fire yards, and burning probably also occurred along several known and suspected aboriginal trails that passed through the prairies and forested areas.

Permanent Euro-American settlement in the Bald Hills commenced in the late 1860s with the arrival of the Lyons Family, who ran sheep and cattle in the area for more than 100 years (Bradley n.d.). Landscape manipulation, including prescribed burning to improve forage and prevent conifer encroachment into prairies, was an important component of the Bald Hills ranching industry. Intense grazing activity presumably influenced local vegetation communities and facilitated the spread of exotic grasses. Several local Native American women married into the Lyons family, and other Native American men and women were employed as laborers. Many of these individuals supplemented their ranch earnings by collecting wild plant and animal foods, and presumably continued to use management techniques (except burning, which was banned in the early 1900s) that originated during pre-contact times.

Commercial logging of conifers was conducted in the forested portions of the Bald Hills from the 1930s to the 1970s (Best 1995).

The long-term and intense human use of the Bald Hills has left a remarkable record of extant cultural resources on lands administered by Redwood National and State Parks. Park staff has identified one archeological district (Bald Hills Archeological District), one cultural landscape/historic district (Lyons Ranches Rural Historic District), and one ethnographic landscape (Bald Hills Ethnographic Landscape). Together these landscape types form a diverse palimpsest of cultural phenomena centered on the major prairies and intervening forest. In each case the contrasts in vegetation and the interplay between prairie and non-prairie lands, in particular, contribute heavily towards their significance.

Development of a Bald Hills Management Plan

Beginning in 1978, park staff and other researchers initiated a suite of ecological studies in the Bald Hills focusing on vegetation, soils, wildlife, geologic processes, and cultural resources. From these investigations a variety of threats to the Bald Hills landscape emerged including conifer encroachment, exotic species invasion, and increased erosion from logging/ranch roads. These resource threats ultimately led park managers to develop the Bald Hills Vegetation Management Plan (National Park Service 1992). The plan articulated how the transition from

anthropogenic use of the Bald Hills over many hundreds of years to the rapid changes brought by post-settlement disturbances could serve as a reference point for the restoration and management of the Bald Hills.

The dominant management strategy identified in the plan was to reverse or minimize the immediate effects of post-settlement impacts and maintain the highest diversity of pre-European plants and animals possible. To this end, the Bald Hills Vegetation Management Plan prescribed a set of management strategies to improve native plant establishment and diversification, to protect existing pre-European fauna, repair or eliminate roads, and preserve in perpetuity the pre-settlement ethnographic landscape.

Beginning of Prairie Restoration and Burning

With the acceptance of the Bald Hills Management Plan as a programmatic document to guide activities in the Bald Hills, work began immediately to implement the recommended strategies. Staff focused their efforts on several key recommendations including the restoration of prehistoric fire regimes, control of invasive exotics, and the control of encroaching conifers within the prairies and oak woodlands.

By 1990, fully one-quarter of the original extent of the Bald Hills vegetation had changed to coniferous forest and another half of the area was threatened. Due to the size and density of many of the trees, primarily Douglas-fir, park staff used manual removal methods to remove unwanted trees. By 1998, crews had eradicated conifers from about 2,000 acres (809 ha) of prairie and oak woodlands, resulting in increased native plant species diversity, improved wildlife habitat, and the preservation of cultural landscapes.

As a part of the conifer removal program, prescribed burning was instituted to provide ongoing maintenance of treated areas. About 1,500 acres (607 ha) of prairies and oak woodlands were treated in the first year (1993) of full-scale operational burning in the Bald Hills. Among the post-burn fire effects were an increase of native species diversity, reduced fuel loads, high conifer seedling mortality, and a reduction in key exotic plant species. Building on this success, the fire program has actively treated 500 to 2,000 acres (202 to 809 ha) of oak woodland and prairie annually, with fire return intervals as short as three years in some areas (see figure 3).

Recent Developments

While the implementation of the tactics advocated in the Bald Hills Vegetation Management Plan (National Park Service 1992) yielded the intended results, recent management directives prompted a re-analysis of the current approach. First, Redwood National and State Parks prepared a General Management Plan that contained a preferred management alternative that pledged to support resource management strategies that would restore the Bald Hills' prairies and oak woodlands created and maintained by Native American burning. Second, the plan provides contemporary Native Americans with the opportunity to "participate in the identification, designation, and management of such cultural and ethnographic landscapes," and to collect "certain natural materials" in conjunction with "the maintenance and interpretation of designated cultural and ethnographic landscapes" (Redwood National and State Parks 2000:42).

In addition to previously stated resource management goals, prescribed burning would also be used to promote the quantity and quality of *certain natural materials* of value to contemporary Native Americans. What remained to be determined were the identities of those natural materials as well as the ability to compatibly manage them along with other resources.

To this end, Redwood National and State Parks contracted with the Yurok Tribe Culture Department to compile information on traditional use of the Bald Hills by Native Americans. Studies included an extensive literature search, field investigations, and interviews with knowledgeable elders (Gates and others 2000, 2002). Recognizing the value of a multifaceted management strategy for the Bald Hills, these reports underscored the importance of Native American management in the Bald Hills through time. Encompassed within this realization is the need to learn more about the specifics of those management practices as well as the role of contemporary hunting and gathering as tools for both maintaining the Bald Hills ethnographic landscape as a cultural entity and assisting the local Native American community in perpetuating traditional practices.

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This search for lost ways of living provides for some fascinating studies into the complex relationships Native Americans had with the land. For example, Native Americans have consistently expressed a desire to harvest ungulates from Redwood National and State Parks. The proper management of hazel patches in the Bald Hills is also a top priority, including burning and pruning to improve the yield of useable shoots. A collaborative study between the National Park Service and California Indian Basketweavers Association (CIBA) monitored physiological changes in a hazel patch in the southeastern portion of the Bald Hills (Siefkin and others 2002).

What remains to be determined, however, is how or if the future restoration and maintenance of the Bald Hills ethnographic landscape will differ fundamentally from the current approach. Properly managing individual hazel

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patches and oak groves may dictate a specialized application of prescribed fire in both time and space. Burning to promote increased numbers of ungulates may ultimately prove detrimental to the restoration of important basketry materials because Roosevelt elk are highly attracted to young hazel shoots (Siefkin and others 2002). The Culture Department of the Yurok Tribe eloquently expressed the potential ambiguity of natural and cultural resource management issues in the Bald Hills:

> The Bald Hills was and continues to be a multi-ethnic, multi-variant, and multi-use landscape requiring a multi-management approach. Bald Hills management plans and strategies may easily conflict as a result of singularly focused management objectives. Management plans and strategies that seek to complement the various resources values and user group interests will succeed. (Gates and others 2002:i)

Finally, while it is admirable that the National Park Service has made provisions to allow practices that will help Native Americans perpetuate aspects of traditional culture, it is still unclear which practices fit within the overall agency mission. The collection of basketry materials and certain plant foods, such as acorns, are relatively uncontroversial and are viewed positively by resource managers and the interested public alike. Hunting and fishing, however, have far less appeal among the same audiences, and would certainly receive more scrutiny. When one considers that division of labor was an important concept in native California societies (Wallace 1978), the decision to permit female pursuits, such as gathering of basketry materials, but continue to prohibit primarily male activities, like hunting and fishing, would imply that agency resource managers and the public can dictate which traditional cultural practices are appropriate to perpetuate at Redwood National Park, and also the gender of those likely to participate.

Conclusion

In many cases it is difficult, if not impossible, to determine which portions of the environment are due strictly to non-human influences and which are the result of Native American influence. In ecosystems where Native Americans burned regularly it is even more difficult to determine what ecological condition the land would have been in without Native American influence due to fire's ability to dramatically affect the environment. Failure to mimic Native American fire use in the Bald Hills would result in the loss of significant cultural resources including a cultural landscape/historic district. Similarly there would be a significant loss of "natural" resources including vegetation types not protected elsewhere, a decrease in biodiversity in comparison to that which existed prior to European influence, and the loss of plant species that occurred in the Bald Hills prior to the arrival of humans. While the benefits to Redwood National Park have been clearly recognized, the role contemporary Native Americans will have in perpetuating and profiting from the relationship requires further definition. If recent collaborative involvement is any indication, the future of natural and cultural resource management in the Bald Hills is probably bright.

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