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# Tending the Wild

Native American Knowledge  
and the Management of  
California's Natural Resources

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Plants are thought to be alive, the  
juice is their blood, and they grow.  
The same is true of trees. All things  
die, therefore all things have life.  
Because all things have life, gifts  
have to be given to all things.

**WILLIAM RALGANAL BENSON**, *Pomo*,  
*in E. M. Loeb*, *Pomo Folkways*

# Introduction

The New World is in fact a very old world. The mountain forests, broad inland valleys, oak-studded hills, and deserts of the region now called California were thoroughly known, celebrated in story and song, named in great detail, and inhabited long before European explorers sailed along the west coast of North America for the first time. Every day of every year for millennia, the indigenous people of California interacted with the native plants and animals that surrounded them. They transformed roots, berries, shoots, bones, shells, and feathers into medicines, meals, bows, and baskets and achieved an intimacy with nature unmatched by the modern-day wilderness guide, trained field botanist, or applied ecologist.

The first European explorers, American trappers, and Spanish missionaries entering California painted an image of the state as a wild Eden providing plentiful nourishment to its native inhabitants without sweat or toil. But in actuality, the productive and diverse landscapes of California were in part the outcome of sophisticated and complex harvesting and management practices.

California Indians protected and tended favored plant species and habitats, harvested plant and animal products at carefully worked out frequencies and intensities, and practiced an array of horticultural techniques. Through coppicing, pruning, harrowing, sowing, weeding, burning, digging, thinning, and selective harvesting, they encouraged desired characteristics of individual plants, increased populations of useful plants, and altered the structures and compositions of plant communities. Regular burning of many types of vegetation across the state created better habitat for game, eliminated brush, minimized the potential for catastrophic fires, and encouraged a diversity of food crops. These harvest and management practices, on the whole, allowed for sustainable harvest of plants over centuries and possibly

thousands of years. In other words, California Indians were able to harvest the foods and basketry and construction materials they needed each year while conserving—and sometimes increasing—the plant populations from which they came.

During the course of their long history in California, Indians so exhaustively explored the plant kingdom for its uses and so thoroughly tested nature's responses to human harvesting and tending that they discovered how to use nature in a way that provided them with a relatively secure existence while allowing for the maximum diversity of other species. In the context of the entire continuum of possible human interactions with nature, ranging from exploitation and human-designed environments to hands-off preservation, this relationship between the indigenous people of California and the natural world represented a middle way, a calculated, *tempered use* of nature. *Tending the Wild* explores how California Indians managed economies that occupied this middle portion of the continuum. It recasts them as active agents of environmental change and stewardship, shattering the hunter-gatherer stereotype long perpetuated in the anthropological and historical literature of California.

The terms "hunter-gatherer" and "forager," inaccurate anthropological labels assigned to most California Indian groups, connote a hand-to-mouth existence. They imply that California Indians dug tubers, plucked berries, and foraged for greens in a random fashion, never staying in any one place long enough to leave lasting human imprints. But as *Tending the Wild* demonstrates, the indigenous people of California had a profound influence on many diverse landscapes—in particular, the coastal prairies, valley grasslands, and oak savannas, three of the most biologically rich plant communities in California. Without an Indian presence, the early European explorers would have encountered a land with less spectacular wildflower displays, fewer large trees, and fewer parklike forests, and the grassland habitats that today are disappearing in such places as Mount Tamalpais and Salt Point State Park might not have existed in the first place.

### A Tended Wilderness

Through twelve thousand or more years of existence in what is now California, humans knit themselves to nature through their vast knowledge base and practical experience. In the process, they maintained, enhanced, and in part created a fertility that was eventually to be exploited by European and Asian farmers, ranchers, and entrepreneurs, who imagined themselves to have built civilization out of an unpeopled wilderness. The concept of Cali-

fornia as unspoiled, raw, uninhabited nature—as wilderness—erased the indigenous cultures and their histories from the land and dispossessed them of their enduring legacy of tremendous biological wealth. As the environmental historian William Cronon notes, “The removal of Indians to create an ‘uninhabited wilderness’—uninhabited as never before in the human history of the place—reminds us just how invented, just how constructed, the American wilderness really is.”<sup>1</sup>

John Muir, celebrated environmentalist and founder of the Sierra Club, was an early proponent of the view that the California landscape was a pristine wilderness before the arrival of Europeans. Staring in awe at the lengthy vistas of his beloved Yosemite Valley, or the extensive beds of golden and purple flowers in the Central Valley, Muir was eyeing what were really the fertile seed, bulb, and greens gathering grounds of the Miwok and Yokuts Indians, kept open and productive by centuries of carefully planned indigenous burning, harvesting, and seed scattering.

Of course, there were some places that had little or no intervention from native peoples, and these would qualify as true wilderness under the modern definition. The subalpine forests, the drier desert regions of southern California, the lower salt marsh areas, the beach and dune communities, and the alkali flats and serpentine balds with widely spaced plants do not burn readily; nor do they support large numbers of economically useful plants. In addition, there were areas that were off limits to burning because their favored plants were not fire-tolerant or the terrain was too rugged, or for other reasons.<sup>2</sup> In general, however, most of the plant communities in California were influenced in varying degree by Indian management.<sup>3</sup>

California Indians did not distinguish between managed land and wild land as we do today. The word for wilderness is absent from many tribal vocabularies, as is the word for civilization.<sup>4</sup> “Viewed retrospectively,” writes Max Oelschlaeger in *The Idea of Wilderness*, “the idea of wilderness represents a heightened awareness by the agrarian or Neolithic mind, as farming and herding supplanted hunting and gathering, of distinctions between humankind and nature.”<sup>5</sup>

Interestingly, contemporary Indians often use the word *wilderness* as a negative label for land that has not been taken care of by humans for a long time, for example, where dense understory shrubbery or thickets of young trees block visibility and movement. A common sentiment among California Indians is that a hands-off approach to nature has promoted feral landscapes that are inhospitable to life. “The white man sure ruined this country,” said James Rust, a Southern Sierra Miwok elder. “It’s turned back to wilderness” (pers. comm. 1989). California Indians believe that when hu-

mans are gone from an area long enough, they lose the practical knowledge about correct interaction, and the plants and animals retreat spiritually from the earth or hide from humans.<sup>6</sup> When intimate interaction ceases, the continuity of knowledge, passed down through generations, is broken, and the land becomes "wilderness."

## Indigenous Resource Management

Resource management is not a modern invention. Indigenous people in California and elsewhere have practiced the roots of this applied discipline for millennia. Our California landscapes, a reflection of historical processes, both natural and cultural, bear the indelible imprint of a medley of management techniques. The major aim of this book is to shed new light on the diverse ways in which native peoples of California very purposefully harvested, tended, and managed the wild—pruning tobacco patches, burning willow to discourage insect pests, allowing for rest periods between sedge rhizome harvests, and maintaining plants with edible seed in the understories of open lower montane forests.

The foundation of native peoples' management of plants and animals was a collective storehouse of knowledge about the natural world, acquired over hundreds of years through direct experience and contact with the environment. The rich knowledge of how nature works and how to judiciously harvest and steward its plants and animals without destroying them was hard-earned; it was the product of keen observation, patience, experimentation, and long-term relationships with plants and animals. It was a knowledge built on a history, gained through many generations of learning passed down by elders about practical as well as spiritual practices. This knowledge today is commonly called "traditional ecological knowledge."<sup>7</sup>

The traditional ecological knowledge of California Indians and the techniques they used to manage nature are still retrievable. The historical literature contains many descriptions of Indian practices and former landscapes, before they were completely transformed by Euro-American settlement. Archaeological findings provide information on diet, tools, and demographics. Phytolith studies and fire scar data can tell us about patterns of indigenous burning and the former composition of plant communities. The growth pattern, form, and age of plant material used for the weapons and baskets in museum collections can tell us how the plants were cultivated in nature. Ecological field studies of the responses of plants to burning, pruning, or digging can also tell us much about indigenous management techniques and their effects. Finally, native people themselves still retain a

great deal of the knowledge of their ancestors. Even today, Bodega Miwok/Dry Creek Pomo women gather edible peppernuts (*Umbellularia californica*) along stream banks; Yokuts men dig yerba mansa (*Anemopsis californica*) tubers for medicine in wind-riffled valley grasslands; Cahuilla women pluck long golden flowering stalks from deergrass (*Muhlenbergia rigens*) tufts along desert washes for their baskets.<sup>8</sup> Interviews of these people—especially the elders, whose grandparents lived before the Gold Rush—yield valuable and rich information about how and when areas were burned, which plants were eaten and used for basketry, and how those plants were managed.

*Tending the Wild* uses all these diverse sources of information to make the case that indigenous land management practices were largely successful in promoting habitat heterogeneity, increasing biodiversity, and maintaining certain vegetation types that would otherwise have undergone successional change. In many cases, native harvesting and management strategies were likely attuned to the reproductive biology of specific native plants and grounded in sound ecological principles.

This is not to say that all actions of California's indigenous people proved positive. The earliest humans in California may have been responsible, at least in part, for the Pleistocene extinction of the region's megafauna. The biologist Daniel Guthrie speculates that the earliest human settlers on San Miguel Island in California's Channel Islands may have been involved in the extinction of at least two of its wildlife inhabitants: the flightless goose (*Chendytes lawi*) and the giant island mouse (*Peromyscus nesodytes*). Other research indicates that in later prehistory, California Indians may have overharvested certain animals. The research of the archaeologists Mark Raab and Katherine Bradford suggests that indigenous people overharvested coastal shellfish, especially black abalone (*Haliotis cracherodii*), on San Clemente and Santa Catalina Islands in prehistoric and historic times. And the archaeologists William Hildebrandt and Terry Jones have presented unmistakable evidence that prehistoric hunting along the California coast led to the overexploitation of marine mammals.<sup>9</sup>

Certainly California Indians were effective predators and influenced the distribution, abundance, and diversity of large mammals. "At times the intense intervention in non-human process by Indians resulted in depletions of important resources, especially the larger animals," claims the geographer William Preston. "By late Pre-Columbian times, many of the larger species of animals were constrained demographically and spatially by the subsistence requirements of the native dwellers." He postulates that the large numbers of deer, elk, antelope, beaver, and otter reported around the time of



Spanish missionization were a result of the relatively sudden diminishment of native hunting: "Their populations simply irrupted as their chief predator, the California Indians, were reduced by protohistoric plague."<sup>10</sup>

Very little is known about the impact of native harvesting on the flora. It is reasonable to assume, however, that the peoples migrating into what is now California more than ten thousand years ago undoubtedly experienced a learning curve, apprising the limits to resource use and then adjusting their harvesting and management from the lessons learned. At times, the result was landscape degradation and species reductions or extinctions, but over the long term, valuable lessons were learned about how to steward nature for future generations.

In general, accounts of the impact of native people on the land have been skewed in two almost contradictory ways. In some cases, these impacts are simply *assumed* to be negative. The possibility of beneficial influences, such as enhancing the numbers and diversity of other species, is seldom considered.<sup>11</sup> Then there is the old view that the population levels of Indians in California were so low, and their technologies so unadvanced that they had little or no impact on wild nature. Another version of this stance is the idea of the "conservation-minded Indian" put forth by some environmentalists. This view fosters a one-sided image of the California Indian as an ecological eunuch whose minimalist interventions on the environment served to guard nature's virgin treasures without despoiling or changing them. J. Donald Hughes expresses such a view in *American Indian Ecology*: "An Indian took pride not in making a mark on the land, but in leaving as few marks as possible: in walking through the forest without breaking branches, in building a fire that made as little smoke as possible, in killing one deer without disturbing the others."<sup>12</sup> The shallow image of the conservation-minded Indian who hardly uses, let alone influences nature and feels guilty about breaking a branch is perhaps based on a romantic notion stemming from Euro-American longings to have those same tendencies rather than on serious research into indigenous lifeways. California Indians have never advocated leaving nature alone.

### Restoration

Learning about the ways in which the indigenous people of California appropriated plants and animals for cultural uses while allowing them to flourish can help us to change the ways in which we interact with nature today. Following the indigenous example, we can move beyond knowing and celebrating nature only through the view of a camera lensfinder, the end of a



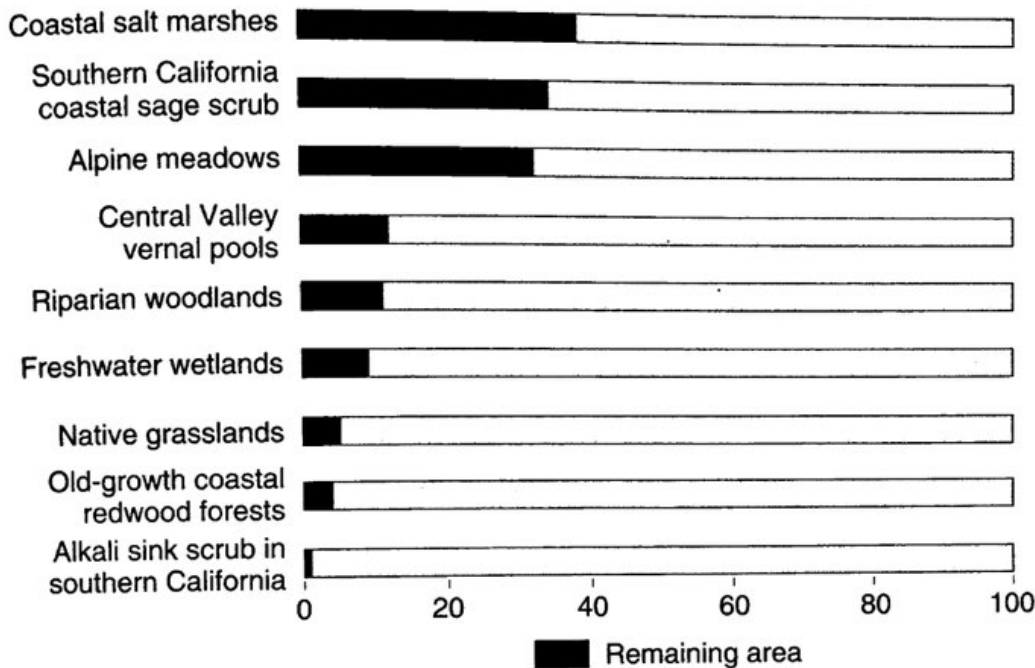


Figure 1. Remaining area of selected California ecosystems, as a percentage of total original acreage. Sources: Robert Holland pers. comm. 2005; Mark Stromberg pers. comm. 2005; Noss et al. 1995; R. F. Noss, ed., *The Redwood Forest* (Island Press, 2000).

tape measure, or the stroke of a paintbrush on canvas. We can begin to see the possibility of becoming part of localized food webs once again, being full participants in nature, and restoring and reinhabiting damaged lands.

Many of the state's native ecosystems—which contain plants of cultural significance to native people, give California its uniqueness, and act as reservoirs of precious biodiversity—are vanishing. (See Figure 1.)<sup>13</sup> Some temperate habitats in California are being eliminated more rapidly than most tropical rain forests and stand to lose as great a proportion of their species. With exceedingly diverse soil, topography, and climate, California harbors 25 percent of the biological diversity in the continental United States. Since the 1850s, at least twenty animal species and thirty-four plant species native to the state have gone extinct. For example, the San Joaquin Valley tiger beetle (*Cicindela tranquebarica*), the Santa Barbara song sparrow (*Melospiza melodia graminea*), and the Los Angeles sunflower (*Helianthus nuttallii* subsp. *parishii*) have vanished forever. Although extinction is a natural process, modern humans have driven the rate of extinctions today to about one hundred times the natural rate.<sup>14</sup> Dwindling biodiversity is linked to contemporary land uses, which cause degradation, fragmentation, and outright loss of habitat.<sup>15</sup>

A primary way that we have responded to the loss of biodiversity, the degradation of ecosystems, and the endangerment of particular species is by setting aside land and protecting it from virtually all human influences. The assumptions behind this strategy are apparent in the way that we define wilderness. According to the Wilderness Act of 1964 (Public Law 88-577), wilderness is "an area where the earth and [its] community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which . . . generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable."

Much of what we consider wilderness today was in fact shaped by Indian burning, harvesting, tilling, pruning, sowing, and tending. This fact suggests an alternative way of conserving the lands that have so far largely evaded (or have somewhat recovered from) the impact of modern society: manage them by applying the traditional ecological knowledge and traditional resource management practices of California's indigenous peoples.

Although setting aside areas as wilderness is still absolutely necessary given our population numbers, there are compelling reasons to protect, restore, and manage some "wild" lands by following a model other than the hands-off wilderness model. Under what could be called the "indigenous management model," we can re-create specific human-ecosystem associations within designated areas and use them to restore and maintain these areas as they were when first visited by non-Indians. David Egan, editor of *Ecological Restoration*, defines this kind of ecological restoration as "[t]he practice of re-establishing the historic plant and animal communities of a given area or region and renewing the ecosystem and *cultural* functions necessary to maintain these communities now and into the future" (pers. comm. 1996). The indigenous management model can also be extended to the more settled and human-influenced rangelands, forests, and residential open space mosaics surrounding the state's wild lands, with indigenous management principles helping landowners, gardeners, farmers, and resource managers to better manage, restore, and use their lands.<sup>16</sup>

Wildland areas can also be co-managed with California Indian tribes, with the goal of restoring, maintaining, and enhancing the natural resources important to their cultures. Such arrangements could be beneficial to all stakeholders, particularly the Indian tribes, whose cultures are endangered in part

because of the obstacles they face in continuing their cultural traditions: lack of access to gathering sites and the degradation of plant quality, soil fertility, and biological diversity.<sup>17</sup>

## Renewal

The cultures of the indigenous people of California are rooted in a belief that nature has an inherent ability to renew itself, to cause the return of the geese, the regrowth of the plants with edible bulbs, the germination of next year's crop of wildflowers. This belief is reflected in the names of the lunar cycles and the annual ceremonies welcoming the return of particular animals and dances honoring the ripening of acorns and other crops. But native peoples also believe that renewal cannot happen in the absence of appropriate human behavior toward nature.

The idea that nature has a capacity for renewal as long as humans allow it to occur is not foreign to either Western culture or modern science. The English language is laden with words whose forgotten meanings point to nature's capacity for renewal and instruct us on how to live with nature. For example, the word *resource*, which now connotes ownership and production for profit, comes from the old French feminine past participle *ressourdre*, which meant "to rise again."<sup>18</sup> The word *horticulture*, which comes from the roots *hortus* ("to garden") and *culture* ("to take care of, worship, cultivate, respect"), essentially means "to garden with respect."<sup>19</sup> The visionary forester Aldo Leopold wrote of "the renewal capacity of the earth" and the need for human relationships with nature that *preserve* this capacity. Ecologists point out that large human disturbances that do not mimic perturbations in nature have the effect of simplifying ecosystems and drastically reducing the land's capacity for self-renewal. California has many examples: agricultural fields with excessive salinity from irrigation in the Central Valley; overgrazed areas in pinyon-juniper woodlands; vast clear-cut areas in the Sierra Nevada and along the North Coast. In these and other places, ecosystem processes and structures have been so damaged that the land can no longer be used for farming, grazing, or timber harvesting without expensive technological inputs.<sup>20</sup>

Finding ways to use and live in the natural world without destroying its renewal capacity is one of the major challenges facing modern-day Californians, just as it was for the people who migrated here more than ten thousand years ago. The detailed descriptions of the land use and management practices of California Indians contained in *Tending the Wild*—the results

of thousands of years of experimentation, adaptation, and ingenuity—can help us to meet this challenge. With a better understanding of the California that untold generations of Indians created, and the ways in which they brought it about and maintained it, we can reinhabit California as more circumspect stewards.