UCLA
American Indian Culture and Research Journal

Title
A Forest for the Trees: Forest Management and the Yurok Environment, 1850 to 1994

Permalink
https://escholarship.org/uc/item/7qn456xf

Journal
American Indian Culture and Research Journal , 19(4)

ISSN
0161-6463

Authors
Huntsinger, Lynn
McCaffrey, Sarah

Publication Date
1995-09-01

DOI
10.17953

Copyright Information
This work is made available under the terms of a Creative Commons Attribution-NonCommercial License, available at https://creativecommons.org/licenses/by-nc/4.0/

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

AMERICAN INDIAN CULTURE AND RESEARCH JOURNAL 19:4 (1995) 155–192

A Forest for the Trees: Forest Management and the Yurok Environment, 1850 to 1994

LYNN HUNTSINGER AND SARAH MCCAFFREY

Like other tribes in the United States, the Yurok of northwestern California have been dispossessed of most of their indigenous territory (figure 1).[1] The majority is now owned by timber corporations or is part of national parks and forests. Although the Yurok Reservation includes a contiguous area of fifty-six thousand acres along the Klamath River, in 1995 only scattered parcels, comprising less than five thousand acres of the reservation, are under some semblance of tribal ownership, with the rest mostly in non-Indian hands. Historically, despite the granting of a reservation and allotments to Yurok people, control of reservation and allotment natural resources has been withheld from them under the auspices of scientific forest management. Landscape change resulting from the displacement of indigenous management regimes has been a major factor in divesting the Yurok people of natural resources, land, and indigenous lifeways. The direct effect of federal Indian land tenure policy on Indian lifeways has long been recognized, but the role of ecological change resulting from suppression of tribal control of natural resources has received less attention. This paper is an analysis of the replacement of Yurok

Lynn Huntsinger is an assistant professor and Sarah McCaffrey is a graduate research assistant in the Department of Environmental Science, Policy, and Management of the University of California, Berkeley.

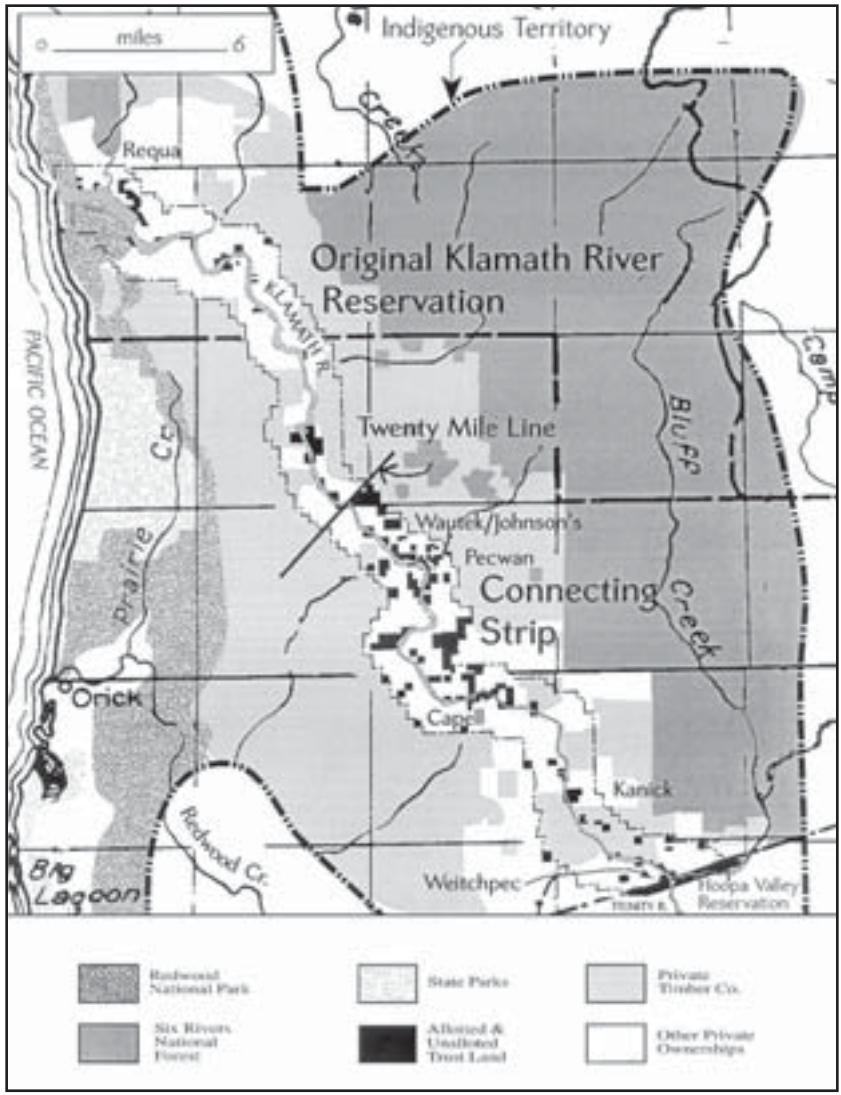


FIGURE 1. Land tenure along the lower Klamath, 1994 (adapted from T.T. Waterman, Yurok Geography, University of California Publications in American Archaeology and Ethnography 16:5: 177–314, 1920; United States Soil Conservation Service, Reconnaissance Survey of the Hoopa Valley Indian Reservation, California [Denver, CO: U.S. Bureau of Indian Affairs, Sacramento, CA, 1938]; BIA Land Title Office Records, Sacramento, California).

Downloaded from http://meridian.allenpress.com/aicrj/article-pdf/19/4/155/1360089/aicr_19_4_cv0758kh373323h1.pdf by University of California Los Angeles user on 28 September 2022

forest management regimes with Euro-American "science-based" forestry programs—the shift from a forest for people to a forest for trees—and its role in the loss of Yurok ownership of and access to culturally and economically important natural resources.

The norms of American "science-based" professional forestry were largely adopted from nineteenth-century German and French forestry schools.[2] By way of the United States, this brand of forestry has influenced forest management programs in much of the world,[3] and in the Bureau of Indian Affairs. Studies in Asia, Africa, and Latin America have characterized "scientific forestry" as a vehicle used by a centralized state to wrest control of forest resources from local people.[4] Historically, federal forestry programs have played a similar role in the Yurok forest, providing an ideological justification for national control of reservation natural resources. The failure of forestry-based international development programs has been ascribed to professional norms that discount the local social or cultural context of forest use.[5] Well-intended at the outset, forestry programs designed to benefit the Yurok have not resulted in the development of a sustained, healthy, local economy. Instead, ecological change resulting from imposed forestry programs has abetted the suppression of Yurok economy, artistry, and spiritual practice, magnifying the devastating impact of federal policy initiatives on Yurok land tenure.

The link between cultural survival and control over management and allocation of natural resources has been increasingly recognized as a global issue in international development programs, but the history of the Yurok forest makes it apparent that this issue is also germane in the United States. Natural resource management shapes an environment in accordance with the norms and expectations of the manager. A landscape is manipulated biologically to produce certain goods and services , creating, in the process, what might be termed a normative landscape. The ecological changes resulting from a shift in management regimes constitute the imprint of a change in social relations; one group's normative landscape is supplanted by that of an ascendant group. Along with the military conquest of the Yurok people, the United States, through the vehicle of professional forest management, changed the Yurok landscape.

The 1975 Indian Self-Determination and Educational Assistance Act (88 Stat. 2203-2217) and subsequent legislation gives tribes opportunities to assert more control over their remaining natural resources.[6] In his work on community management of

natural resources, Murphree argues that, once a community has assumed tenure and control of management decisions, the state should serve only a regulatory function.[7] However, in the case of the Yurok forest, federal regulation may represent continued external control of the Yurok landscape and, as argued here, restriction of Yurok cultural practices as linked to indigenous landscape characteristics. This paper first compares Yurok indigenous and professional forest management as each affects the ecological structure and function of the Yurok forest and landscape. Next examined are the interwoven roles of federal forestry-driven ecological change and federal Indian policy in the attrition of the Yurok forest. The conclusion offers observations about the current status of the forest and prospects for restoration.

INDIGENOUS FOREST MANAGEMENT

In an unconscious acknowledgment of the interconnection of a people and a landscape, the author of a nineteenth-century county history of the Klamath River area wrote, "[T]he Indians, like the redwoods, are doomed to fall before civilization."[8] The Yurok indigenous economy was based on access to a wide variety of vegetation types and conditions dispersed geographically throughout the Klamath watershed and temporally with the seasons. The Yurok diet included acorns, grass seed, clover, wild sunflower, and a variety of fruits, bulbs, and nuts, complemented with protein-rich game and fish. Homes were constructed of redwood planks *(Sequoia sempervirens),* bows of yew *(Taxus),* and baskets of hazel *(Corylus cornuta),* willow *(Salix spp.),* maidenhair fern *(Adiantum pedatum),* and beargrass *(Xerophyllum tenax).* To acquire these and a host of other materials from the Klamath River watershed, Yurok people employed two main strategies: A system of usufructory rights to gathering, hunting, and fishing sites allowed individuals, families, and villages some assurance of access to resources at both distant and near locations during the appropriate time of year; at the same time, the Yurok actively managed the watershed to enhance the diversity of plant and animal goods provided. In the steep and heavily forested Klamath River watershed, the Yurok used fire to preserve or increase the spatial and temporal extent of grassland, oak woodland, and shrubland plant communities.[9] To lay the groundwork for evaluating the implications of the shift to Euro-American forest management regimes, this section reviews Yurok indigenous

land use patterns, use of forest plant communities, and management practices.

The Yurok indigenous territory includes well over four hundred thousand acres, including about forty miles of the Pacific coast and forty-two miles of the Klamath River watershed to the confluence of the Klamath and Trinity rivers[10] (figure 2). The largest village was Requa, at the mouth of the Klamath, with twenty-five redwood-plank houses.[11] Although a few of the fifty-four or more original villages—the homes of some twenty-six hundred people—were on the coast, the Klamath River was the center of Yurok life for most of the tribe.[12] The predominant vegetation types along the river are redwood forest and mixed evergreen forest composed primarily of Douglas fir *(Pseudotsuga menziesii),* tanoak *(Lithocarpus densiflorus),* and oak *(Quercus sp.)*[13] (figure 2). The scope of this discussion does not include the coast.

The observations of T.T. Waterman, a geographer who studied the Klamath early in the twentieth century, provide some insight into the connection between Yurok lifeways and the plant communities along the Klamath River:

> [W]here the river runs approximately east and west the towns lie on the north bank, in the proportion of three or four to one. . . . The south-facing slopes [on the north bank] are timbered with oaks and varied timber, interspersed with fine grass fields. The northern slope of the hills, which would form the south bank of the river, is, on the contrary, almost uniformly covered with pines and other conifers, and the places which might otherwise be village sites are in the shadow of these somber forests. Beginning some miles above the mouth of Blue Creek, the river flows through a belt of redwood timber extending almost to the coast. The larger villages are very clearly grouped outside of this redwood belt. There were towns within it, but they were of small size, and where the redwoods were thickest there were no settlements at all.[14]

Yurok settlements were in sunnier, open locations. In addition to being warmer, the more open areas of the forest provide a richer and more diverse supply of game and plant foods than densely forested areas. But regardless of the location of a village or dwelling, usufructory rights to specific sites assured access to distant sites for valued materials that were simply not available in plant communities close to home.

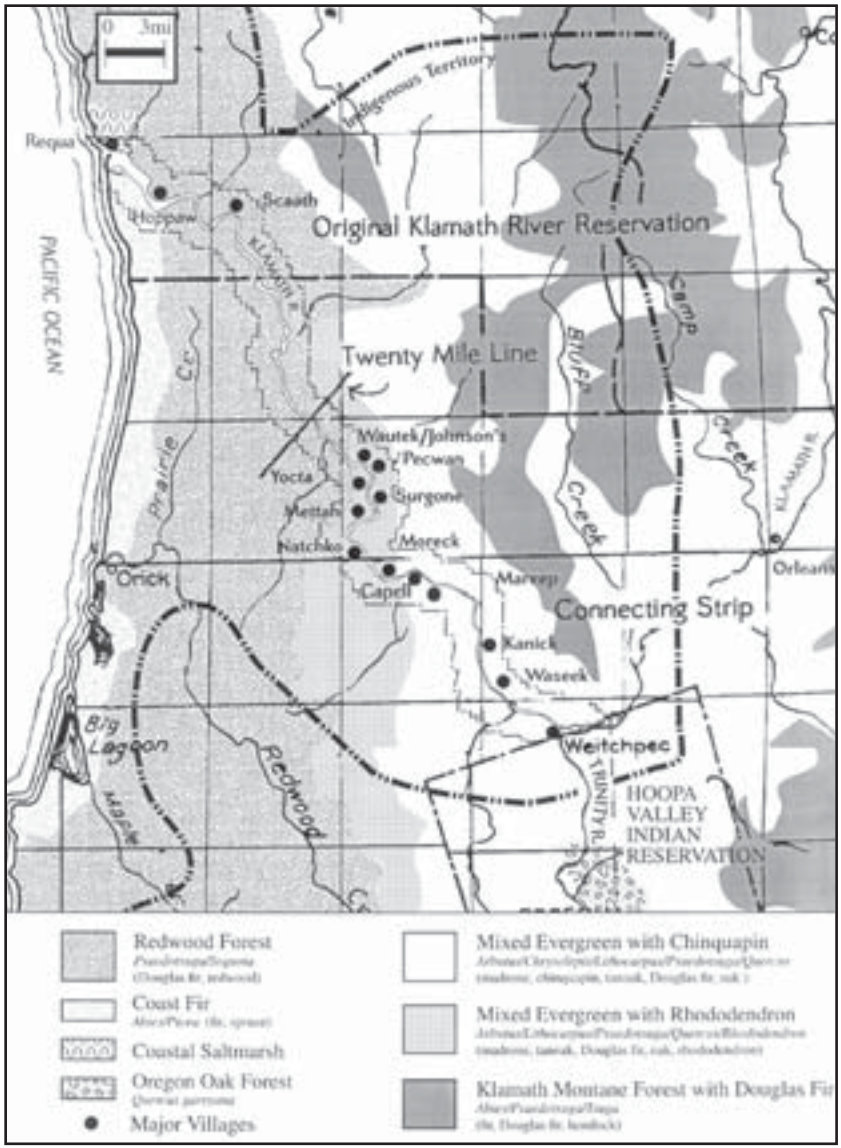


FIGURE 2. Vegetation in Yurok Indigenous Territory (adapted from Waterman, Yurok Geography; U.S. Soil Conservation Service, Reconnaissance Survey; and A.W. Kuchler, Map of Natural Vegetation of California [Lawrence, KS: Department of Geography, University of Kansas, 1977]).

Usufructory Rights: Access to Dispersed Diversity

T.T. Waterman mapped sites scattered along forty miles of the river that were used each year by a single household and controlled through usufructory rights.[15] A Yurok author wrote recently that one Yurok family, faced with having to select small plots of land in the 1890s under the Dawes Act, strategically selected them to protect gathering, fishing, and spiritual sites formerly held in usufruct by family members.[16] Of the thirteen sites chosen, at least four were sacred places, three were acorn grounds, and two were places for gathering grass seed. One additional site was a stand of yew trees, used for making bows. Lucy Thompson, a Yurok woman writing in 1916, describes areas managed by rights of access as including sites for "gathering grass seeds, such as Indian wheat, which looks similar to rye, besides other kinds of seed; the oak timber for gathering acorns, the sugarpine for gathering pine nuts, the hazel flats for gathering hazelnuts and the fishing places for catching salmon."[17] Rights to the use of valuable hunting, fishing, and gathering areas were held by individuals, families, or villages and might be divided temporally according to the date of use, by the height of the river, or by the goods harvested—for example, in the case of a fishing site, by whether eels or salmon were taken.[18] Such rights could be shared, traded, and inherited[19] and gave holders a direct interest in the maintenance of these areas:

> The oak timber they were very careful to preserve, as they gathered acorns from it late in the fall, October and November. The oak tree furnished the staff of life. . . .[20]

The spiritual life of the tribe is linked to sites used for ceremonies, spiritual training, and gathering of ceremonial or medicinal materials, and to access to specific natural resources. The major Yurok ceremonial dances, including the White Deerskin and Jump dances, traditionally take place in specific locations along the Klamath and its tributaries.[21] They require gathering of plant materials and redwood timber from particular forest sites in the watershed.[22]

Characteristics of Forest Plant Communities

Within the redwood and mixed evergreen forests of the reservation, several highly generalized plant communities can be de-

scribed, each providing characteristic goods for the Yurok: redwood stands, Douglas fir stands, oak woodlands, shrublands, and prairie grasslands. Redwood stands are typically found on river flats where flooding occurs every several decades or on lower canyon slopes; they have a limited understory and are notably low in plant and animal species diversity. The redwood belt runs inland from the coast for more than twenty miles along the Klamath River to the Wauteck area (figure 2). Although originally the redwood forest was only sparsely populated, the redwood itself is an important tree. Traditional houses and sweathouses are built of redwood planks, as are the canoes that once were the major means of transportation. Redwoods are also prominent in the spiritual lore of the tribe, often referred to as spiritual guardians or warriors in the anthropological literature and by current residents.

Douglas fir stands predominate upriver, from the end of the redwood belt to the border of the Hoopa Valley Reservation (figure 2). In areas where it is relatively open, with a developed understory and/or intermixed with oaks, the species-rich Douglas fir forest is used by the Yurok for hunting game and for gathering. Denser areas of the forest are nearly as limited in use and diversity as the redwood forest.

Oaks grow best and produce the most acorns when free of dense fir or redwood stands, and tanoaks, in particular, can be abundant intermixed with Douglas fir and redwood, where the conifer canopy is relatively open. On some soil types and in drier areas, the firs drop out entirely and oaks are the predominant tree species, most notably on hillside grass and woodland formations often referred to as "bald hills" oak woodlands, where Oregon white oak *(Quercus garryana)* predominates. Common Klamath species are tanoak, black oak *(Q. kellogii)*, Oregon white oak, and canyon live oak *(Q. chrysolepis)*. Often a number of valued acorn-gathering places occur close together on a hillside where there is a heavy growth of oak for several acres. Oak woodlands are also rich in game, largely because the oak understory is a forage-rich complex of grasses and shrubs, and acorns are a food valued by many species, particularly elk and deer.

Away from the coast, grasses and shrubs predominate in forest openings, along some riparian areas, and in the understory of open woodlands. Their extent is sometimes determined by soil conditions—for example, where fluvial processes or shallow soils exclude trees. But they also can occupy redwood and Douglas fir sites for many years as a transition phase following the removal of

the trees. Eventually they are shaded out by the regrowth of conifer trees. Shrub and grass species are rich sources of plant foods, medicinal and spiritually important herbs, and basketry materials. Shrubs are crucial forage for game, notably wild browsers such as deer, while prairie lands are especially used by elk.

Yurok Management: Access to Diversity through Manipulation

The particular plant community or vegetation type occupying a site is determined by a combination of environmental factors, including soil, climate, and site history, such as fire and flooding. The Yurok manipulated fire to preserve or increase the spatial and temporal extent of grassland, oak woodland, and shrub communities rich in useful plant materials and game. Reservation residents and a variety of researchers have stated that fire was used by the tribe frequently for managing trees, for clearing underbrush, for hunting and trapping game,[23] and for protecting villages and houses from larger fires by clearing the nearby area. Traveling the reservation in 1912, a forest surveyor commented that the "entire reservation was over-run by fire."[24]

Fire was used for a variety of purposes in each of the major vegetation types. Burning in redwood stands was probably small in scale but regular and widespread, intended primarily to enhance the growth of low forest floor vegetation for basketry materials and to maintain forest openings or "prairies."[25] Recent tree-ring studies in nearby Prairie Creek reveal a fire frequency from 1714 to 1881 of every six years, with fires occurring most commonly in the fall.[26] Redwood bark is highly resistant to fire, and groves are characterized by charred bark. Some researchers argue that frequent burning in redwood groves stabilizes them by removing understory "ladder fuels" that might carry a fire into the more vulnerable redwood canopy and by removing shade-tolerant competitors like Douglas fir.[27] Burning also made travel in the forest easier[28] but probably had little effect on the overall extent of redwood forest along the river. The primary means of reproduction for redwood is vigorous and rapid resprouting, which means it can respond quickly even to catastrophic fire or flooding, while the root base continuously occupies the site. On the other hand, because sprouting is the major means of reproduction, redwood does not spread rapidly through seed dispersal.

Some parts of the coastal redwood forest may have burned only rarely.[29] An exploration party passing through the redwood forests of Humboldt County early in the twentieth century described the small prairies as lifesaving oases providing game and plant foods absent in the other parts of the forest:

> [W]ithin the forests, at all elevations from sea level to the top of the ridges, there were small open patches, known locally as prairies, producing grass, ferns, and various small plants. . . . [M]ost of these patches if left to themselves would doubtless soon have produced forests, but the Indians were accustomed to burn them annually so as to gather various seeds. . . .The statement of Professor Jepson that "there is today more wooded area in Humboldt County than when the white man came over a half century since," was confirmed by reports made to the writer that some of the old prairies had come up to young growth of forest. These prairies were of incalculable value to the Indians, not alone for their vegetable products, but also for the game found upon them. . . . At one time the party fasted three days and lost two pack mules by hunger and exhaustion, before they came to a prairie stocked with game and grass. From there they went on for ten days "without the sight of any living thing that could be made available or useful for food." Ascending a rocky prominence they reached another prairie where they saw on one side "little knots of deer, on another and nearer . . . a large herd of elk, and still in another direction both." One of the men in the . . . party and several of the mules starved to death before the trip ended, but the Indians were better acquainted with the location of these oases, as it were, in the midst of desolation, and they maintained regular trails between them.[30]

Frequent fire was also used to manipulate the characteristics of Douglas fir stands. Burning can open the conifer canopy to favor oak reproduction and growth, to stimulate acorn production, and to keep the understory open for ease of travel, gathering, and hunting. A Douglas fir forest with an open canopy and abundant oaks supports a considerably more diverse complex of understory plant and animal species than a dense, closed-canopy forest.[31] Recent fire history research on the Klamath National Forest concluded that "the pre-settlement landscape was probably exceptionally patchy containing complex mosaics of different age and size Douglas fir dominated stands."[32]

The Yurok also used fire to limit the extent of Douglas fir forest, as described by Thompson:

> The Douglas fir timber they say has always encroached on the open prairies and crowded out the other timber; therefore they have continuously burned it and have done all they could to keep it from covering all the open lands. Our legends tell when they arrived in the Klamath River country that there were thousands of acres of prairie lands, and with all the burning that they could do the country has been growing up to timber more and more. . . . Many of the prairies were set on fire and burnt off every year during the dry seasons, which kept the timber from growing up very fast.[33]

Douglas fir does not resprout, and reproductive success by seed is variable, so the extent of Douglas fir forest is more labile in response to fire than that of redwood. One fire history study in a nearby area showed that, on six of nine plots examined, no regeneration of Douglas fir occurred for up to 240 years after fire.[34] Tiny Douglas fir seedlings must survive browsing, trampling, drought, competition from grasses, shrubs, hardwoods, and herbs, and other dangers for several years to approximate the size of a first-year redwood resprout. The seedling stage is highly vulnerable to fire-induced, long-term vegetation change, because the immature trees have not yet established a seed bank. Seeds must be dispersed from mature individuals in unburned areas, a process that can take several years, depending on where the nearest unburned trees are. Lacking the fire-resistant bark of redwoods, a mature Douglas fir is also vulnerable to fire. On the other hand, where not excluded by fire, edaphic, or climatic conditions, Douglas fir can be an aggressive colonizer of open or moderately shady sites through dispersal of millions of seeds. Because young fir seedlings tolerate some shade, they can colonize oak woodland understory. Once established, seedlings can easily grow a meter a year under the right conditions and quickly overtop the oaks, which cannot survive for long or reproduce under the dense shade. In addition, the shrub and herb understory is completely shaded out, converting the site to conifer forest.[35] Frequent burning that does not kill the oaks but removes the conifer seedlings can halt this progression, maintaining oak woodlands indefinitely.

Oak woodlands were usually burned in the late summer or fall.[36] Mature oaks, a valued food source for the Yurok, can

withstand the low intensity fire that results when woodlands are burned regularly and carefully, and many oak species can resprout. Burning not only keeps out invading conifers and shrubs but clears the ground to facilitate acorn gathering and is believed to inhibit disease and pests.[37]

The shrub types on the Klamath watershed are often transitional to other vegetation communities, particularly conifer forest, and, without intervention, may be shaded out by a thickening overstory within ten to fifty years. Fire was used to support continued presence of forest openings where hazel and willow shrubs grew, plants valued for their medicinal and basketry qualities. Fire was also used to manipulate the growth of shrubs to produce suitably long or straight stems for weaving. Thompson describes management of hazel shrubs:

> The Indians also took the greatest of care of the hazelnut flats, as the nuts are used in many ways. . . . In taking care of the hazel flats, they go out in the dry summer or early in the fall months and burn the hazel brush; then the next spring the young shoots start up from the old roots. On the following spring in the month of May, when the sap rises and the shoots start to grow, the women go forth and gather these young shoots, which are from one to two feet in length.[38]

Regular burning stimulated the production of fruits. Other turn-of-the-century observers write,[39]

> In the fall of the year it was the duty of certain men to burn patches of oak, hazel, and huckleberry brush to eliminate fungus and insect damage and to improve the crop in the next year. In the second year after burning there was usually a heavy increase in hazel nuts, acorns, and berries. In 1885–95, it was not unusual to see them bring in loads.

Anecdotal accounts, interviews, pollen and tree-ring studies, Yurok lore, and historic photographs indicate that, under indigenous management, shrublands, oak woodlands, and prairies were more widespread in the Yurok forest and in northwestern coastal California, in general, than at present.[40] One study found a sevenfold increase in Douglas fir and a corresponding decrease in oak woodlands and grasslands in a nearby watershed.[41] Another study in Redwood National Park showed a loss of about one-third of the "bald hills" oak woodlands typical of the Yurok

high country since 1850, with indications that half of the remaining oak woodlands would be lost within the next twenty to thirty years.[42]

A simplified "states and transitions" model for a site capable of supporting mature Douglas fir forest can be used to illustrate the influence of fire management on vegetation dynamics (figure 3). Designed for the purposes of this discussion, boxes represent vegetation communities or "states" that are easily recognized and that can persist on a site for several years. Transitions are represented by arrows between boxes and represent possible paths of vegetation change. In this case, the temporal and spatial scale has been selected to offer a conceptual framework for comparison of indigenous and Euro-American management practices. The Yurok managed their landscape to emphasize spatial and temporal persistence of the vegetation states represented by the unshaded boxes.

FEDERAL MANAGEMENT OF THE YUROK FOREST

The coming of Euro-Americans to the Klamath region dramatically changed the use, management, and ultimately the landscape of the Yurok forest. Two major mechanisms can be identified by which the Yurok were divested of their forest resources: (1) by straightforward expropriation of their lands, as Yurok property rights were ignored and access to gathering sites was cut off; and (2) through ecological change brought about by a shift in management regimes. American management changed the forest, even on lands still owned by the tribe or its members. In these cases, the simple title to a piece of land was preserved, but the land itself was changed. In United States forestry programs, the land tenure rights remaining to Indian owners included the right to alienate the land but not to manage the vegetation. Vegetation management and Yurok culture and economy were closely linked. The increasing unsuitability of the changed forest for Yurok subsistence helped push the Yurok to sell their land.

Gold strikes near the fork of the Trinity and Klamath rivers during the Gold Rush brought trade and settlement, with sporadic violence and epidemics, to Yurok territory in the mid-nineteenth century. Reservations were established in the region to separate local tribes from miners and settlers. While providing some haven for the tribes, reservations cut off access to high country sites used for gathering and spiritual practice.[43] In 1855,

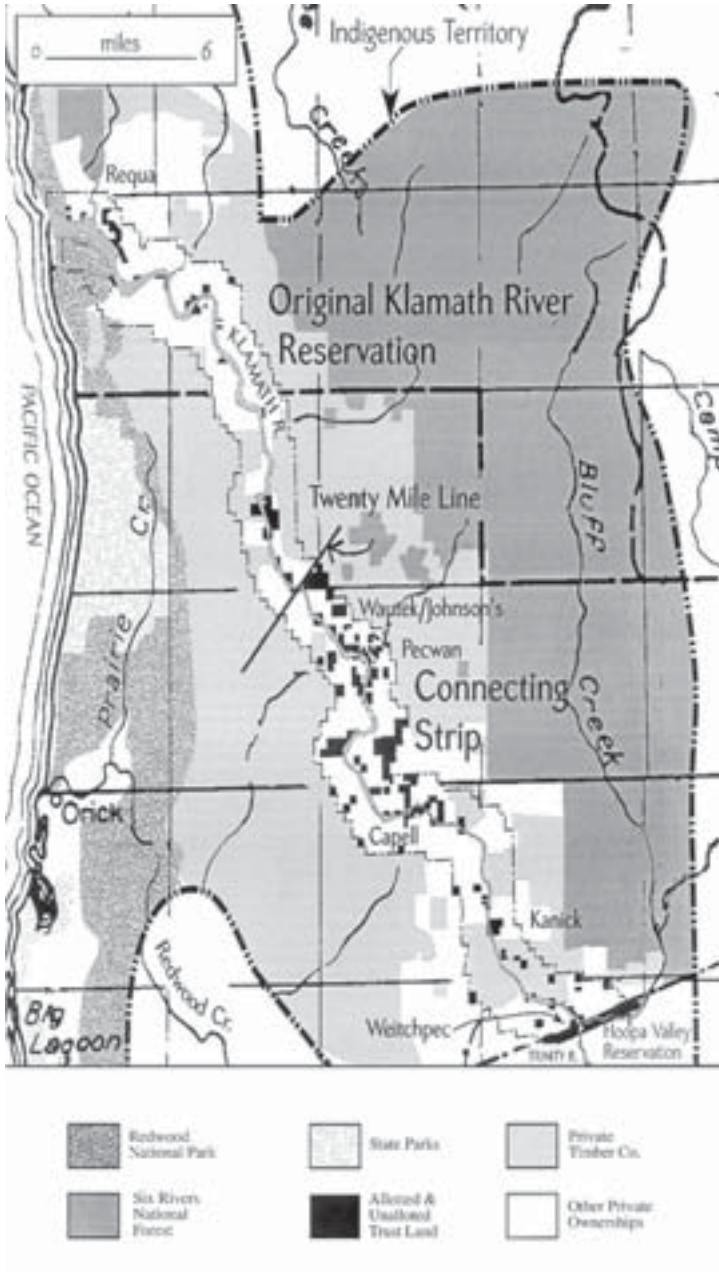


FIGURE 3. States and transitions for a Douglas fir site in the Yurok Forest. In this highly simplified states and transitions model, boxes represent generalized vegetation states that are possible on a single site over time, and arrows represent some of the pathways (transitions) possible between them.

an Executive Order by President Franklin Pierce[44] set aside one mile on either side of the lower twenty miles of the Klamath River as the Klamath River Indian Reservation (figure 1, "Original Klamath Indian Reservation"). In 1864, the Hoopa Valley Reservation was established upriver, and, in 1891, by Executive Order of President Harrison, the twenty-mile stretch between the two reservations (figure 1, "Connecting Strip") was incorporated into one reservation that extended from the Hoopa Valley for one mile on either side of the Klamath River to the sea.[45] This forty-mile stretch along the Klamath, some fifty-six thousand acres, became known as the Hoopa Valley Reservation Extension. Prior to the passage of the Dawes Act, reservation lands were used collectively by the tribe, and federal influence on the reservation consisted mainly of using the military to keep the peace and exclude the increasingly numerous and vociferous white squatters.

Allotment of Yurok Lands

Through the late nineteenth and most of the twentieth century, federal Indian policy vacillated between encouraging Indians to leave the reservation and the promulgation of economic development programs for reservations. In the latter half of the nineteenth century, the prevailing view of land tenure was that land rightfully belonged to individuals who could make productive use of it, and the common public attitude was that to allow land to go unused was antiprogressive. Modeled on the Homestead Act, the General Allotment (Dawes) Act of 1887 was intended to better the lot of the Indian people by applying the principles of individual initiative and property rights to reservations.[46] Indians were to become "civilized" through the process of learning to farm.

Under the Dawes Act and its amendments, individual Indians were to be given allotments of 160 acres for farming or 320 acres for grazing livestock, to be held in trust for them by the federal government. Once the allottee learned to farm and manage his or her own affairs, the land would become "fee-patented" as the taxable private property of the allottee, who would be granted citizenship. Preceding and coincident with the passage of the Allotment Act, settlers near the Klamath River were aggressive in pressuring Congress to release timber-rich Klamath River Reservation lands for purchase by non-Indians. Yurok redwood stands were becoming increasingly valuable, since the wood was in demand and timber along the river accessible. Locally, the imple-

mentation of the Dawes Act became a means for non-Indians and the timber industry to obtain access to forest resources. In accordance with the yeoman-farmer ideology of the times, allotments were restricted to "agricultural" lands along the river—an almost nonexistent land category in any realistic sense on the Yurok reservation.

The 1892 Act (27 Stat. 52) authorizing allotment of the "Original Klamath River Reservation"[47] (figure 1), provided that all unallotted properties would be returned to the public domain and disposed of to settlers.[48] This provision was contrary to the intent of the Dawes Act itself, which declared that unallotted reservation lands would be purchased after negotiation with the tribe,[49] and contrary to the Executive Order of 1891 incorporating the Klamath River Reservation into the Hoopa Valley Reservation. Probably not coincidentally, the lands of this portion of the reservation included most of the valuable redwood belt and the easily accessible timber on the Klamath. About fifteen thousand of the twenty-five thousand acres of the original Klamath River Reservation were returned to the public domain and sold or homesteaded after the 161 Indian residents of the reservation received allotments averaging sixty acres in 1893. The small size of the allotments was justified by the paucity of land suitable for agriculture in the densely forested and steep Klamath watershed.

Authority for allotments in the connecting strip between the original Klamath River and Hoopa Valley Reservations (figure 1) was granted by President Benjamin Harrison on 30 September 1892. In 1898–99, after the area was surveyed, allotments were granted on 19,357 acres, averaging forty acres for each allottee. In this case, since the Executive Order did not stipulate what was to be done with the unallotted lands on the connecting strip, about three thousand acres remained in what is referred to as "tribal trust." The Douglas fir forests of this part of the reservation were worth little as timber at the time, and access was difficult. The adjacent U.S. Forest Reserves, which now occupy a great portion of Yurok indigenous territory as the Six Rivers National Forest (figure 1), were established by presidential proclamation in 1905. The land was available at the time because, unlike the valuable redwood stands along the river, these forests were not so actively sought by private interests.

The immediate impact of the reservation and allotment of the Yurok forest was a loss of access for tribal members to the broad array of geographical sites formerly used. Villages were aban-

doned as allottees were encouraged to move onto their own parcels.[50] In a 1918 report, the reservation superintendent noted that, "for some reason the land that was sold [to whites, after being returned to the public domain] contained practically all of the valuable timber and the land that was allotted to the Indians was what was left over." The superintendent knew "nothing about the circumstances under which these allotments were made but each time that I make a trip to the territory I have it more forcibly impressed upon my mind that somehow the Indians did not get a fair portion of the land."[51] The "valuable timber lands" described by the superintendent were the "leftover lands," according to the East Coast-derived yeoman farmer ideology underlying the Dawes Act. Perhaps the first impact of ideas about "forestry" on Yurok lands, then, was that, in the nineteenth century, timber production was not seen as a suitable economic activity for Indians or even for individual settlers but instead as the work of large-scale endeavors, particularly when it came to the giant redwoods.[52] That no effort was made to adjust the stipulations of the act to local environmental and economic conditions served to transfer almost one-third of reservation timberlands, including 61 percent of the land in the redwood zone (figure 2), directly to non-Indian ownership.[53]

Professional Forestry in the Bureau of Indian Affairs

The ideology of professional forestry, adopted by the Bureau of Indian Affairs largely from the Forest Service, had major impacts on the remaining Yurok land and the Klamath watershed. Professional forestry programs interwove with federal Indian policy initiatives through the twentieth century, at times providing a means of enacting social ideas about land use and economic development on the ground. One of the "cultural norms" of professional forestry holds that growing and protecting trees is the highest and best use of a forest.[54] The resulting forestry programs divested the Yurok of any remaining control over forest resources and contributed to further reductions in land holdings.

Professional forestry became a factor in reservation management around the turn of the century as the Progressive Era (1900–1920) introduced technological and scientific approaches to government administration. The conservation ethic that began developing at the end of the nineteenth century stimulated the establishment of

the Forest Reserves. Creation of the Forest Service in 1905 and the BIA's Division of Forestry in 1910 provided the administrative vehicles through which scientifically trained foresters were placed in charge of public timberlands and Indian reservation forests. Gifford Pinchot, the first chief of the Forest Service and often characterized as the father of American professional forestry, looked to Bernard Fernow and German forestry methods to develop a modern, "science-based" professional forest management program for the United States.[55] Indian forests were to be part of a national, conservation-based forest management program that would assure a steady supply of timber and protection of watersheds.

The professional forestry of the Forest Service in the Department of Agriculture was the major influence on the Department of the Interior's Indian forestry program from its inception. Between 1902 and 1909, along with other power struggles between Interior and Agriculture, the Forest Service and the BIA competed for supervision over Indian forests. In 1906, a cooperative agreement gave administrative authority over reservation lands to the Forest Service, but, after the Forest Service ran into trouble managing the Menominee tribe's timber, authority was transferred back to the Bureau of Indian Affairs (BIA) in 1909. In a last-ditch attempt, Gifford Pinchot managed to convince an outgoing President Roosevelt to transfer eight unallotted Indian forests, including the Hoopa, to Forest Service authority in 1909, but the courts ruled that the president had no such authority, and the executive proclamations were formally rescinded in 1912.[56] The Act of 3 March 1909 (35 Stat. 783) was the organic act for the BIA's Division of Forestry. The division's chief forester from 1914 to 1933, J.P. Kinney, was strongly influenced by Pinchot and the ideology of professional forestry as scientific forestry. He is generally described as having led BIA forestry to "achieve a status of professionalism comparable to other federal forestry programs"[57] and as seeking to "apply the scientific principles of professional forestry to Indian forests, believing that this was the best way to serve the long-term interest of the Indians in accordance with federal trust responsibilities."[58]

The 1910 Omnibus Bill (36 Stat. 857) provided for the maintenance and management of tribal forests, placing the responsibility for overseeing trust property timber harvest and forest management squarely on the BIA. Regulations resulting from the bill and subsequent modifications in 1918 and 1920 established standard-

ized rules and procedures for the use and sale of timber, including marking and scaling and administration of agency sawmills. The regulations detailed the advertising, awarding, and approval of timber sales contracts by the BIA and defined conservation practices, including the sustained yield management of the forests and the protection of Indian forest lands from fire and trespass.

Increased demand for lumber during World War I, together with the advent of professional forestry, contributed to the shift in BIA focus from managing Klamath River lands primarily for agriculture to managing them for timber and "protecting forests." Logging for wages provided work for Yurok men and economic support for Yurok families. But, as scientific knowledge about forests and watersheds increased, the rules by which Yurok people could use or harvest their own forest became more complex. At the same time, practices supported by the norms of professional forestry gradually made Yurok land less and less valuable for subsistence or other types of economic use.

Fire Suppression

Professional forestry, perhaps because of its inception in the mesic climate of northern Europe, emphasized the protection of forests from fire. The Forest Service made significant gains in political influence and identity by vociferously advocating fire prevention early in the twentieth century.[59] This has turned out to be a poor plan, particularly for the western states, where vegetation communities and wildlife populations have developed in concert with a combination of natural and indigenous fire patterns. Fire suppression was perhaps the first major form of ecological control exerted by professional foresters on Yurok lands, and it had the added benefit of expanding the domain of forest managers by expanding the acreage of forest.

In the first decades after allotment, indigenous knowledge about the use of fire was helpful for keeping fields clear along the Klamath. But, as the federal government began actively fighting rural "incendiarism," the BIA started to suppress fire in the Yurok forest. In a 1912 letter, the commissioner of Indian affairs authorized the superintendent of the Hoopa Valley Reservation and Extension to offer a one-hundred-dollar reward for an "incendiarist" who set a succession of fires on the reservation that year.[60] The Act of 20 September 1922 (42 Stat. 857) mandated that the secretary of the interior protect timber in national parks, on Indian

reservations, and on other lands under the jurisdiction of the department from the depredations of fire, insects, and beetles. Suppressing fire in the Klamath River region was reportedly not an easy task because of inaccessibility, limited funds, and the belief by the Yurok that "fires are a good thing for the country."[61] A 1938 SCS report illustrates the interplay of fire suppression and professional forestry perspectives:

> It is reported that in the past it was a general practice to burn timber and browse lands with the expectation that annual burnings would promote grass growth. Although this practice has been discouraged and is rarely followed now, there is still a degree of sentiment in its favor. It is believed that much of the browse cover has developed as the result of fires, and that most of the brush areas would eventually produce a fine stand of fir timber if fires were prevented and suppressed and grazing properly managed.[62]

In 1942, the Forest Service organized the Cooperative Forest Fire Prevention Campaign to encourage average citizens all over the country to participate in fire prevention as part of the war effort, again reinforcing fire suppression policies in the Yurok forest.[63]

Once fire was removed as an available management tool, ecological conditions in the Yurok watershed began to change. Fire suppression meant that, without cultivation, flooding, wildfire, or soil limitations, the land was largely reclaimed by trees (figure 3). One Klamath homesteader's case, described in BIA correspondence, illustrates the situation:

> While Issac Griggs was alive he, along with Laura Griggs' brothers, intensively farmed the original homestead. Any land level enough to cultivate was plowed every year and crops were planted and harvested for family sustenance. After Issac died the family continued to farm and periodically burn to control the encroaching brush, which at the time, was Douglas fir and huckleberry. The land contained little old growth and the best was cut for fence and buildings. There was a continual encroachment of Douglas fir on the plowed land. . . . By 1925, most of the arable land in this . . . area had been taken over by Douglas fir and cultivation had ceased.[64]

Long-term vegetation change studies along the north coast show an increase in Douglas fir cover over the last century, most likely attributable to fire frequency changes.[65] Landscape level changes in vegetation resulting from fire suppression have most likely also had a significant effect on many wildlife populations, most notably a reduction in the deer population.[66] Species associated with woodlands and shrubby forest stages decline with their habitats.

Landscape Change and Land Sales in the 1920s

Managing the reservation for a "fine stand of timber" precluded most indigenous modes of subsistence, as well as crop production and grazing. Environmental shifts resulting from fire suppression and the forest professionals' focus on maximizing tree growth meant that allotments along the Klamath were becoming an increasingly poor source of direct support for their owners. Together with the "forced fee patent" policies of BIA commissioner Cato Sells, ecological change helped push Yurok families to sell their lands during the 1920s. In a congressional atmosphere fostered by World War I that stressed maximum production of food and fiber from land, such criteria as amount of education and/or white blood could be used to declare an allottee competent and to award him or her a fee patent (fee simple title) to the land, whether or not the allottee wanted to take the allotment out of trust. A competency commission visited the area in 1918 to list "competent" allottees, and in 1924 the BIA superintendent was instructed to do the same. In the end, fee patents were awarded to allottee owners of about 62 percent of allotment acreage in the redwood zone (figure 2), and 46 percent of allotment acreage in the Douglas fir zone, about one-third of the reservation altogether (figure 4). The vast majority of lands were taken out of trust on one of four dates in 1919 and 1925.

Fee patented lands were subject to property taxes, but little regular income could be earned from these small parcels. Timber marketing from small parcels had limited feasibility due to poor access and low values for Douglas fir; it was a poor substitute for farming or hunting, fishing, and gathering as a source of consistent support. Allotments that did have valuable timber were often trespassed, since BIA protection, particularly in the redwood belt, was minimal. Those able to find a market for their timber may have taken their land out of trust to avoid the complexities of BIA

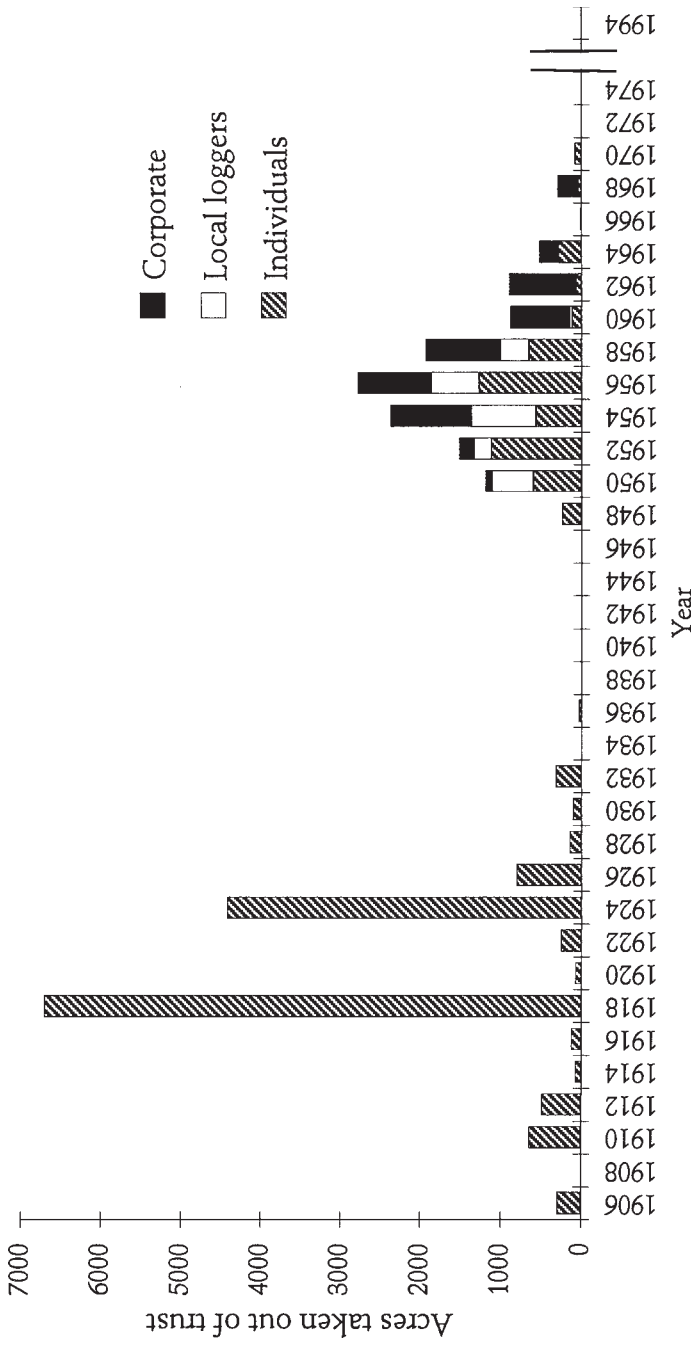


FIGURE 4. Acres taken out of trust, 1905 to 1994 (BIA Land Title Office, Sacramento, California).

timber management regulations, a process requiring only the agreement of the allottee or allottee heirs and encouraged by the BIA at the time (figure 4).[67] There are discussions in BIA correspondence of land fraud schemes and timber companies taking advantage of Yurok allottee debt problems to acquire land.[68] Yet the emphasis of BIA forestry was increasingly on managing for sustained yield timber production.

Sustained Yield Forestry and Coordinated Planning

Sustained yield forestry was announced as a goal of the BIA Division of Forestry as early as the 1910 Omnibus Bill. At first, this simply meant that, when timber was cut, provision should be made for its regrowth. As American forestry programs developed, the ideal became management of a large, contiguous forest property for a sustained yield of timber by cutting and harvesting different sections on an annual basis to provide a steady flow of cash returns.[69] "Coordinated forest planning" for sustained yield became a byword of the forestry programs developed during the 1930s and 1940s in response to the Indian Reorganization Act (IRA) of 1934 (48 Stat. 984-988). Forestry that provided a reliable income and source of employment to Indian communities was seen as part of the New Deal approach.[70]

The IRA repealed the 1887 Dawes Allotment Act, extended the trust period indefinitely, and authorized the organization of tribal governments. Nationwide, efforts were made to solidify tribal land bases by returning surplus lands to tribal control and by encouraging the voluntary transference of allotted lands back to the tribes through acquisition or death inheritance. The Indian Conservation Corps provided reservation jobs and carried out a variety of construction projects. Together with a slump in timber prices following the Depression, the immediate impact on the Yurok forest was a dramatic stabilizing of the land base (figure 4). But the emphasis in the act on long-term coordinated forest planning and sustained yield forestry also laid the groundwork for extensive alienation of Yurok forest land in the 1950s.

Yurok lands ultimately could not fit the mold designed for modern, scientific forest management as envisioned by the Indian Reorganization Act. IRA conservation and land rehabilitation programs mandated that the BIA develop a coordinated forest plan for optimal use on a long-term basis.[71] Achieving this re-

quired large blocks of contiguous, tribally held trust land, but most of the Yurok portion of the reservation was in highly fragmented trust allotments held by individuals and families with differing ideas about how to use and manage their lands. The BIA's forestry branch was ill-equipped to coordinate management among different owners.[72] Professional forestry ideology emphasizes the technical and scientific aspects of forestry—how to grow and market trees—rather than social aspects such as coordinating and obtaining consensus among different landownerships and developing processes for participatory management.[73] As the number of heirs for allotments increased, keeping track of and obtaining consensus among owners became even more of a problem. As a result, trust allotments had to be managed on a case-by-case basis[74] and were, in fact, largely neglected. BIA management activity became dominated by attempts to combat arson and illegal cutting. In some cases, the stipulations of the IRA added further complications to the timber harvest regulations faced by allottees. When possible, allotments were to be managed as parts of larger "timber management units" composed of contiguous tribal properties. This, however, meant that an individual allotment would be eligible for harvest only once every several decades, as part of a larger unit.[75] Smaller harvests of a few trees at a time that might have provided a regular income stream on small parcels were out of the question.

In addition, although a few large unallotted trust properties did exist, there was no formal tribal government for the bureau to work with in planning forest management on the Klamath. A main criticism of the IRA has been that it forced an alien form of political organization on tribes. Unlike the Hupa,[76] the Yurok, traditionally organized by families and villages, resisted this organization. The treaty signed with "Klamath River Indians" in 1851 includes signatures of the chiefs of the "Seragoines, Cappel, Pakwan, and Wetchpeck tribes (sic)" (figure 1).[77] Some Yurok considered themselves part of the Hoopa Valley Reservation, since it was originally created as a refuge for all local tribes, and believed that organizing separately would restrict their claims to reservation resources in the Hoopa Valley. No forest management plan for the Yurok area (the Extension) was ever developed, and unallotted trust parcels have remained in management limbo up to the present.

Through the 1930s and 1940s, the ecological transformation of the Klamath watershed continued apace. The Yurok were still

using the forest extensively for subsistence, attempting to adapt to the changes in vegetation as brush encroached and timber thickened. When, in the 1930s, the north coast tanning industry requested permission to cut and peel reservation tanoaks, the BIA refused the requests, since acorns were still an important food crop for local people and their livestock.[78] A 1938 Soil Conservation Service survey of the Hoopa Valley Reservation, including the Extension, mentions that acorn mast was an important fodder crop for swine produced and marketed by local Indians.[79]

Cold War Forestry and Termination

Sustained yield forestry was given a major boost in the era of the Cold War, when public attitudes again coalesced on "productive use" ideology and timber prices rose. The entity most able to combine large-scale forest ownership for coordinated planning and substantial capital investment in technology is the large timber corporation. Pinchot's idea of "protecting the forest" came to mean putting the forest into the hands of those best equipped to use it according to professional forestry standards. The conclusion was easily drawn that, if sustained yield management was to be achieved, it was necessary that allotted forest parcels be redirected and purchased by timber producers who could unite them under a single, coordinated management regime. In general, during the post-World War II era, an underlying attitude was that, if Indians were not making the most productive use of their land, then perhaps it was best if the land went into other ownership. The bureau's "termination policy," kicked off by House Concurrent Resolution 108 in 1953 (67 Stat. B132) calling for an end to the trust relationship, was in no small part stimulated by the confluence of these lines of thinking. The reservations nominated for rapid termination were those with significant timber resources: the Menominee, the Klamath, and the Confederated Salish and Kootenai Tribes of the Flathead Reservation. The Hoopa Valley Reservation, which, together with other Pacific Northwest reservations, was responsible for 75 percent of the total U.S. Indian lands timber harvest in the 1950s, was also on the termination list.[80]

The development of Douglas fir plywood during World War II contributed to a steep rise in timber prices along the Klamath. The BIA's complex regulations for timber sales from trust properties are designed to protect the interests of all the heirs of an allotment, to get the best price for the timber, and to set aside money for re-

forestation and forest management. An allottee was not allowed to hire another Indian or relative to harvest the timber on his or her own allotment; it had to be done through organized sale and competitive bid handled by BIA officials via surrender of power of attorney. Unfortunately, it usually took at least two years, and often much longer, to go through the process, and it still does.[81] Alternatively, by removing the allotment from trust, an allottee could sell the timber, or the land and the timber, immediately. Almost all of the final one-third of reservation lands was taken out of trust in this period, including 34 percent of the remaining allotments in the redwood zone and 46 percent of those in the Douglas fir zone. Another way to gain access to reservation forest resources—illegal cutting of timber—was widespread during this period.

Given the beliefs of the 1950s, it is unlikely that an allottee expressing a desire to sell land would have met much opposition from BIA employees. A substantial number of the allotments taken out of trust during this period were fee-patented directly to a timber company or to local loggers (figure 4). Yurok people interviewed in 1993 all believed that the BIA had colluded to sell Yurok lands to large timber interests during this period. A 1955 letter sent to the BIA expresses the impression of the writer, a Yurok allottee, that the BIA would not allow any timber harvest or sale without selling the land along with it.[82] This correspondence between a Yurok woman at the margins of literacy and a distant, jargon-rich federal bureaucracy continued for thirty years. The Yurok woman asks to be able to have a relative cut timber, to decide how much timber and what timber to cut, and to decide when it is to be cut. On all fronts, her requests were denied because of timber harvest regulations designed to "protect the forest and her own interests."[83] In 1959, regulations were passed allowing sole-owner allottees to get a permit to cut their own timber in small quantities under bureau supervision, but obtaining approval still might take years.

Intensive Management

In the 1960s, the Yurok land base again stabilized as timber prices eased, harvest regulations became more flexible, and the BIA began to discourage land alienation. But as the Termination Era waned, intensive forest management rapidly became the norm among forestry professionals. Sustained yield became "maxi-

mum sustained yield," a system that would produce the maximum amount of useful timber possible in the shortest period of time. Intensive forest management helped accelerate change in the watershed to a more forested landscape but also had serious consequences for gathering and cultural activities that persisted in what might be termed "ecological refugia" for grasses, shrubs, and oaks in the forest. Chemical herbicides, brush-raking the soil, and weeding and planting of genetically superior trees was a sign of "good" intensive forest management. "Decadent" trees, past their prime or damaged, were to be cleaned from stands so that the remaining vigorous trees could grow at the fastest possible rate. Oaks and other nonconifers that might compete with the timber-producing species were to be excluded whenever possible. Clear-cut harvests tend to reduce the proportion of oaks in the conifer forest, even without the direct suppression of oaks common under intensive forest management.[84] Fire prevention programs use herbicides to control herb and shrub growth in forest openings and along roadsides.

The Act of 30 April 1964 (78 Stat. 186-7) allowed the harvest of "commercially mature" timber from Indian lands, rather than just mature trees as stipulated previously, opening the way to maintenance of young stands at peak productivity. Commercially mature trees are harvested just when peak growth rates begin to taper off. In addition, under these rules, stands could be converted from mixed-age stands to uniformly aged, rapidly growing trees—ideally largely of the same genetically improved species. Under this management regime in a Douglas fir area, transition from a clear-cut area or shrubland to a rapidly growing Douglas fir monoculture would be accelerated, using understory suppression, harvest, and aggressive replanting to minimize the spatial and temporal persistence of prairie, shrub, oak, and mature forest types (figure 3). Chemical herbicides became the tool of choice for reducing the persistence of grassland and shrub states on the landscape and manipulating the species composition of harvested lands. Herbicides kill the grasses, shrubs, and hardwoods that naturally occupy a site after mature conifer trees are removed. This allows natural or planted genetically improved tree stock to grow back quickly.

Intensive forestry was implemented on adjoining Forest Service properties and on private and trust properties, further reducing Yurok gathering areas. In addition, Yurok people are increasingly concerned about the impact of herbicides on the health of gatherers and local residents. While the Multiple Use Sustainable

Yield Act of 1960 was, in some part, a response to and an attempt to mitigate this overwhelming focus on timber growth in the Forest Service, for Indian lands the BIA's underlying assumption has been that managing a forest in the tribe's interest was satisfied by managing for peak productivity and economic return from timber production.

The Yurok remained an unorganized and, in federal eyes, unrecognized tribe and so received few benefits from the economic development programs of the 1960s. Dispute about the distribution of profits from Hoopa Valley timber harvest and Yurok representation in governance of the Hoopa Valley Reservation resulted in a series of lawsuits, known collectively as the *Jessie Short* case. The culmination was the Yurok-Hoopa Settlement Act of 1988 (102 Stat. 2924), which created the separate Yurok Reservation out of Hoopa Valley Reservation Extension lands. It also required the Yurok to organize and obtain federal recognition.

Management Compacting

Indian activism in the 1970s, including violent uprisings in South Dakota and elsewhere, helped stimulate the passage of the Indian Self-Determination and Education Act of 1975 (88 Stat. 2203-2217).[85] The act provides for tribal contracting, or "compacting," of services previously provided by the BIA and other government agencies. This act and its subsequent amendments in 1988 (PL 100-472) give tribes the opportunity to compact for management of their natural resources. To compact to manage their forest, the Yurok must develop a mutually agreed-upon forest management plan with the BIA. Federal land management regulations will continue to apply to Yurok lands. As tribes throughout the U.S. have taken greater responsibility for their communities, they have struggled with the problems of raising revenues and providing economic opportunities for their people.[86] It is expected that the Yurok will want to develop some sort of timber harvest plan that will provide income but will also address Yurok cultural and spiritual values.

The Indian Forest Management Assessment Team for the Intertribal Timber Council Survey of 1993 showed that, in general, indigenous peoples express a desire to see their forests managed more for cultural and aesthetic needs than has been the case in the past.[87] One interviewee in a study of basketweavers on the nearby

Six Rivers National Forest commented, "You know, it is with the dances and the doctors knowing the plants and taking care of our sacred places that our people will have power and they will survive."[88]

Landscape and Yurok Practices

The landscape change and management practices of scientific forestry programs have become a focal point for struggle over access to natural resources. Despite the dramatic ecological and tenurial changes in the watershed, the Yurok continue to fish, to hunt, and to gather plants. Basketweavers are among the most vocal and organized groups concerned about the various agencies and corporations that have jurisdiction over gathering grounds and the ecological changes brought about by intensive forestry. They complain of being harassed and prevented from gathering and are concerned about forest management practices—particularly the use of herbicides and fire suppression. A *California Basketweavers Association Newsletter* included the following letter:

> In a prime picking area they've gone in with their poisons. I think about what I've got inside of me now, from picking where I've picked, not knowing for sure if it's that place or not. It's a bit scary, and I can't stop it. Not any single person here can do anything about it. But maybe we, as a group working together, can do something to make the changes that individuals can't make.[89]

Regulations designed to protect the environment or forests will affect Yurok options, whether the tribe chooses to restore precontact vegetation patterns or to take advantage of economic opportunities through timber harvest. As one example, about half of the remaining reservation trust properties are in trust allotments dating from the 1890s, and half are in unalloted "tribal trust." A few of the trust allotments and most of the tribal trust parcels are old- or mixed-growth timber. These patches of a few hundred acres of old growth stand out on a watershed where most of the interspersed private lands are either second-growth or in the process of being harvested. On a recent river trip up the Klamath with wildlife biologists representing various government agencies, there was much lamentation about the tattered state of the watershed and considerable interest expressed in retaining the

remaining old growth on Yurok trust parcels for wildlife habitat. The assumption among most of the wildlife biologists was that the Yurok, once fully informed or educated about the wildlife situation, would want to manage primarily for the same wildlife and the same landscape desired by professional wildlife biologists. The wildlife biologist for the Hupa tribe, however, raised a central issue when he remarked that "what's wildlife for one person may not be wildlife for another."[90] Should old-growth-associated endangered species, such as marbled murrelets or spotted owls, be found in the watershed, the Yurok forest could be subject to harvest and management restrictions under the federal Endangered Species Act. Framed in its historical context, as the most recent in a long line of well-intentioned federal resource management policies, such environmental legislation might be seen as just one more imposition of European-American cultural values on the Yurok landscape. If the tribe decides they want to harvest tribal timber for economic gain or to expand shrub and grassland areas, they may be limited by regulations that require them to manage vegetation in a certain way to promote the wildlife or plant species that outsiders value the most. They could wind up bearing the ecological cost for non-Indian harvest of the surrounding watershed.

Although it can be argued that protecting endangered or threatened species stems from an ethic that transcends cultural bounds, it can also be argued that it might prove to be a continued imposition of an alien normative landscape and government assertion of control over forest resources. Scientists seek objective indicators of ecosystem sustainability, and many believe that these standards should then be the basis for regulations, but, in fact, objective standards remain, at best, elusive and arguable. On the Hoopa Reservation, tribal timber harvest regulations instead include management for "culturally significant" wildlife species. Indications are that the Yurok normative landscape was more diverse in plants and wildlife than either the landscape of aggressive management for timber or that of "hands off" management for nature preservation in nearby parks.[91] Clashes over the cultural definition of wildlife, of the forest, and of nature are not unique to the management situation in the Yurok forest today but speak to resource management conflicts all over the world as management schemes are devised to develop, restore, or recapture a normative landscape.

CONCLUSIONS

The indigenous Yurok landscape is a mosaic of vegetation types maintained by burning; for the forester of recent decades, the normative landscape is fast-growing commercial timber forest. The displacement of indigenous management regimes shifted large portions of the Yurok landscape from an open, mixed woodland tailored to sustained hunting and gathering to dense conifer forest reformed to the large-scale endeavors of commercial forestry. Despite a series of federal policy initiatives claiming to strengthen or modernize Indian land tenure, forest management practices and policies have acted to restrict Yurok access to forest resources. The inability to use or manage the forest has abetted the alienation of Yurok land throughout this century. The pattern of Yurok land alienation follows the value of timber upriver, with more than 80 percent of lower river redwood stands taken out of trust before 1930 and more than half of upriver Douglas fir stands not sold until after World War II, when fir values rose and technology made the timber accessible. Further inland, the Hoopa Valley Reservation, where timber originally had the least value and was the most remote, remains largely intact.

The Klamath watershed has changed irrevocably, as has Yurok culture. The ecological changes in the watershed constitute a relatively indirect assault on tribal culture compared to the many direct governmental attacks on the culture and lifeways of the Yurok and other North American indigenous peoples, including outright genocide and the forcible placement of children in boarding schools. Yurok people have adapted to the changes in social, economic, and environmental conditions. Logging employment, for example, has been important to the Yurok for many years and, for some, can be considered a part of cultural identity. As steps are taken to return Yurok properties to more direct tribal control and to reacquire other properties, the tribe faces major decisions about how the forest is to be managed in the future. Medical anthropologists have long recognized the cultural context of restoring a patient to health: The role of the doctor and the tools used are validated by cultural context and definition. So, too, one cannot extricate the ecological restoration of the Klamath watershed and the objectives chosen and tools used from its cultural context.

Fortmann and Fairfax[92] describe four tenets of forestry professionalism that have contributed to the failure of forestry-based international development programs. The first is that nonparti-

san, technical expertise should be the basis for management decision-making—discounting the management goals, practices, or knowledge of local people who use the forest. A second tenet is a commitment to large-scale comprehensive government resource management and planning and a lack of concern with or interest in small-scale, irregular, local, or individual enterprise. Third, there is an overarching emphasis on timber production as the central objective of forest management. Finally, tenet four is a belief that forestry is a biological undertaking that can be separated from its political or social setting. As explained by the authors, foresters will almost always propose a biological solution to forest degradation, such as planting trees, when the real solution may be a political one like land reform. All of these tenets loom greatly in the history of forest management on the Yurok Reservation. One solution is often held to be a greater role in the management of natural resources for the local communities that rely on them.

Addressing community management of natural resources, Murphree argues that the recovery of tenure rights and community linkage to the benefits of resource management is the key to encouraging sustainable management of natural resources.[93] The central state should perform limited, largely regulatory functions, perhaps to assure that broader social interests are protected, while the local people make management decisions and set management goals. The questions that must be asked are, What should be the role of the federal government in the future of the Yurok forest? What kind of framework will protect national interests while giving the tribe the greatest chance at economic and cultural well-being? And, finally, just as their forest has been fragmented by its history, the Yurok tribe today is far-flung in geography and interests. What is the process by which the Yurok people will decide how to manage their resources, and can the BIA or the government facilitate that process?

If we view the restoration or survival process not as an attempt to recapture a static historical state but instead as an attempt to reach a convergence between landscape and changing contemporary cultural values, Yurok people need the tools to construct the landscape they want. These tools include tenure with control over management and the ability to negotiate about the application of imposed ideas of "scientifically valid" management standards and paradigms—paradigms that otherwise can act to privilege one normative landscape at the expense of another.

ACKNOWLEDGMENTS

We would like to express our appreciation to the Yurok Interim Tribal Council, Sally K. Fairfax, Louise Fortmann, Paul Starrs, Richard Fielitz, and Gordon Karnes. We would also like to thank the anonymous reviewers. Their reviews were insightful, conscientious, and a significant contribution to the paper. The Bureau of Indian Affairs funded the forest history of the Yurok forest that provided the data for this work.

NOTES

1. Also referred to was C.C. Royce, comp., *Indian Land Cessions in the United States, 18th Annual Report, 1896–97* (Washington, DC: Bureau of American Ethnography, vol. 18, 1899), California, part 2. It should be pointed out that the depiction of the original Klamath River Reservation presented in Royce is inaccurate in that it extends the reservation more than twenty miles up the river. The Klamath River Reservation upriver boundary is close to the boundary between Township 12 N and Township 11 N. I have verified this from a variety of sources in my extensive search of BIA land title records, including the records of the original allotment grants.

2. Richard Behan, "Forestry and the End of Innocence," *American Forests* (May 1975): 16–49.

3. Louise P. Fortmann and Sally K. Fairfax, "American Forestry Professionalism in the Third World: Some Preliminary Observations." *Economic and Political Weekly* (12 August 1989), 1839–44.

4. Nancy Lee Peluso, *Rich Forests, Poor People: Resource Control and Resistance in Java* (Berkeley, CA: University of California Press, 1992), 4–24; Ramachandra Guha, *The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya* (Berkeley, CA: University of California Press, 1989), 35–61, 185–86.

5. Fortmann and Fairfax, "American Forestry Professionalism in the Third World," 1839–44.

6. Emma R. Gross, *Contemporary Federal Policy toward American Indians,* Contributions in Ethnic Studies 25 (New York: Greenwood Press, 1989), 1–34.

7. M.W. Murphree, *Communities as Resource Management Institutions,* Gatekeeper Series 36 (London: Sustainable Agriculture Program of the International Institute for Environment and Development, 1993).

8. Wallace W. Elliot, *History of Humboldt County with Illustrations* (San Francisco, CA: Wallace and Co., 1882), 1.

9. The Yurok people have a living culture, and the use of the past tense is not meant to imply otherwise. However, the indigenous landscape and broad

application of indigenous management practices are currently a thing of the past, so the past tense is used when discussing them.

10. T.T. Waterman, "Yurok Geography," *University of California Publications in American Archaeology and Ethnography* 16:5: 177–314, 1920, 186.

11. Ibid., 227.

12. Axel Lindgren, introduction to *The Four Ages of Tsurai: A Documentary History of the Village on Trinidad Bay,* by Robert F. Heizer and John E. Mills (1952; Trinidad, CA: Trinidad Museum Society [University of California Press], 1991), i.

13. A.W. Kuchler, *The Map of the Natural Vegetation of California* (Lawrence, KS: University of Kansas, Department of Geography, 1977).

14. Waterman, "Yurok Geography," 205.

15. Ibid., 225.

16. Gary Morris, "A Land Divided: Yurok Land Allotment," *News from Native California Special Supplement* (Spring 1992): 24–27.

17. Lucy Thompson, *To the American Indian: Reminiscences of a Yurok Woman* (1916; Berkeley, CA: Heydey Books, 1991), 26.

18. Waterman, "Yurok Geography," 218–23.

19. Walter R. Goldschmidt, "Ethics and the Structure of Society," *Anthropological Records* 53 (1951): 506–24; W.T. Roberts, Gini Egan-McKenna, David C. White, and Michael T. Roverts, *Indian Land and Forest Resources: An Issue of Trust, a Forest History of the Hoopa Valley Indian Reservation of Northwestern California,* USDI-Bureau of Indian Affairs, Sacramento, CA, 1983, 64–65; Arnold R. Pilling, "Yurok," in *Handbook of North American Indians,* ed. R.F. Heizer (Washington, DC: Smithsonian Institution, U.S. Government Printing Office, 1978), 8: 148.

20. Thompson, *To the American Indian,* 32.

21. Ibid., 135–57.

22. Kathy Heffner, *Contemporary-Historic Yurok Ethnographic Data for the Proposed Simpson Timber Company Land Exchange with Six Rivers National Forest in Klamath, CA* (Eureka, CA: Six Rivers National Forest, 1986), 22–24.

23. Discussions with reservation residents and members of the interim tribal council, summer 1993; Pliny Earl Goddard, "Life and Culture of the Hupa," *University of California Publications in American Archaeology and Ethnography* 1:1 (1903); H.E. Driver, "Northwest California," *Anthropological Records* 1:6 (1939): 297–433.

24. Roberts et al., *Indian Land and Forest Resources: An Issue of Trust,* 138.

25. R.A. Gould, personal communication (1972) to Thomas Blackburn and Kat Anderson, "Introduction: Managing the Domesticated Environment," in *Before the Wilderness: Environmental Management by Native Californians,* ed. Thomas Blackburn and Kat Anderson (Menlo Park, CA: Ballena Press, 1993), 1–26.

26. Peter M. Brown and Thomas W. Sweatnam, "A Cross-Dated Fire History from Coast Redwood near Redwood National Park, California," *Canadian Journal of Forest Research* 24(1994): 21–31.

27. E.C. Stone, R.G. Grah, and P.J. Zinke. "Preservation of the Primeval Redwoods in the Redwood National Park," *American Forests* 78:4 (1972): 50–56.

28. R.A. Gould, personal communication (1972) to Henry T. Lewis, "Patterns of Indian Burning in California: Ecology and Ethnohistory," in *Before the Wilderness* , 100–104.

29. S.D. Viers, personal communication to Henry T. Lewis, "Patterns of Indian Burning," 100–104.

30. L.L. Loud, "Ethnogeography and Archaeology of the Wiyot Territory," *University of California Publications in American Archaeology and Ethnology* 14:3 (1918): 221–423.

31. K.E. Mayer and W.F. Laudenslayer, Jr., eds., *A Guide to the Wildlife Habitats of California* (Sacramento, CA: California Department of Forestry and Fire Protection, 1988).

32. Robin D. Wills and John D. Stuart, "Fire History and Stand Development of a Douglas-fir/Hardwood Forest in Northern California," *Northwest Science* 68:3 (1994): 205–11.

33. Thompson, *To the American Indian,* 33, 85.

34. Wills and Stuart, "Fire History and Stand Development."

35. Lois Reed and Neil Sugihara, "Northern Oak Woodlands—Ecosystem in Jeopardy or Is It Already Too Late?" in *Proceedings: Symposium on Multiple-Use Management of California's Hardwood Resources* Gen. Tech. Rep. PSW-100 (Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, 1987), 59–63, 62.

36. Lewis, "Patterns of Indian Burning."

37. S.M. Schenk and E.W. Gifford, "Karok Ethnobotany," *Anthropological Records* 13:6 (1952):377–92, 282.

38. Thompson, *To the American Indian,* 31.

39. Austen D. Warburton and Joseph F. Endert, *Indian Lore of the North California Coast* (Santa Clara, CA: Pacific Pueblo Press, 1966), 110.

40. Roberts et al., *Indian Land and Forest Resources: An Issue of Trust,* 79; Loud, "Ethnogeography and Archaeology of the Wiyot Territory"; Tom Keter, *A Model of the Historic Environment for the North Fork of the Eel River Basin, Trinity and Mendocino Counties, California* (Eureka, CA: Six Rivers National Forest, 1993); U.S Soil Conservation Service, *Reconnaissance Survey of the Hoopa Valley Indian Reservation, California,* 5 (1938); Reed and Sugihara, "Northern Oak Woodlands," 59–63.

41. Tom Keter, *A Model of the Historic Environment,* 10.

42. Reed and Sugihara, "Northern Oak Woodlands," 62.

43. Dorothea Theodoratus, *Cultural/Historical Overview: Six Rivers National Forest* (Eureka, CA: Six Rivers National Forest, 1980), 85–87.

44. The intent was to set aside one mile on each side of the thirty-six miles of the Klamath to the confluence of the Trinity River, but Congress had limited reservations to twenty-five thousand acres, so the reservation ended at the "twenty-mile line" (figure 1) twenty miles up the river.

45. Act of April 8, 1864, 13 Stat. 39; and Executive Order of October 16, 1891. C.C. Royce, *Indian Land Cessions in the United States,* 832 and 942.

46. Francis Prucha, *The Great Father: The United States Government and the American Indians* (Lincoln: University of Nebraska Press, 1995), 660–70.

47. The lower twenty miles of the Klamath River.

48. M.G. Ripke, acting area director, letter to the commissioner of Indian affairs, Washington, D.C., 5 October 1962. Ripke claims that there is no reservation in existence below the twenty-mile line. Debate about whether the Klamath River Reservation lands were still in a reservation as part of the Hoopa Valley Extension Reservation continued through the decades despite Supreme Court decisions in 1912 and 1973 affirming the existence of the reservation as Indian Country, until it was finally settled by the Hoopa-Yurok Settlement Act of 1988. These lands are now within the Yurok Reservation. The title statement for the Hoopa Valley Extension Reservation excludes trust lands of the former Klamath River Reservation. The Act of June 17, 1892 (27 Stat. 52) was one of many pieces of legislation passed nationwide that modified provisions of the Dawes Act for application to a specific reservation, generally in response to the demands of non-Indian settlers, as discussed in Janet A. McConnell, *The Dispossession of the American Indian, 1887–1934* (Indianapolis, IN: Indiana University Press, 1991).

49. Prucha, *The Great Father,* 668.

50. Waterman, "Yurok Geography," 203.

51. *Report of the Superintendent of the Hoopa Valley Indian Agency,* 11 November 1918: FARC SB HVA:266 Annual Narrative and Statistical Report 1918.

52. Letter from J.B. Mortsolf, superintendent, Hoopa Valley agency, to commissioner of Indian affairs, Washington, D.C., 10 August 1910; Roberts et al. *Indian Land and Forest Resources: An Issue of Trust,* 122, 135.

53. For another discussion of the conflict between environmental conditions and the Allotment Act, see Imre Sutton, "Private Property in Land among Reservation Indians in Southern California," *Yearbook of the Association of Pacific Coast Geographers* 29 (1967), 69–89.

54. Fortmann and Fairfax, "American Forestry Professionalism in the Third World."

55. Behan, "Forestry and the End of Innocence."

56. J.P. Kinney, *Indian Forest and Range* (Washington, DC: Forestry Enterprises, 1950), 142.

57. Alan S. Newell, Richmond L. Clow, and Richard N. Ellis, *A Forest in Trust: Three Quarters of a Century of Indian Forestry 1910–1986* (Washington, DC/Missoula MT: Litigation Support Services/Historical Research Associates, 1986), v.

58. Newell et al., *A Forest in Trust,* 7–25.

59. Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton, NJ: Princeton University Press, 1982), 161–80.

60. Roberts et al., *Indian Land and Forest Resources: An Issue of Trust,* 145.

61. Ibid., 147.

62. U.S. Soil Conservation Service, *Reconnaissance Survey of the Hoopa Valley Indian Reservation,* 5.

63. Pyne, *Fire in America,* 175–78.

64. Thurman B. White, *History of the Area: Addenda to THP 1-90-343* (Santa Rosa, CA: California Department of Forestry and Fire Protection, 1992).

65. Keter, *A Model of the Historic Environment*.
66. Ibid.
67. Roberts et al., *Indian Land and Forest Resources: An Issue of Trust,* 135; letter from J.B. Mortsolf, superintendent, Hoopa Valley agency, to commissioner of Indian affairs, Washington, D.C., 6 November 1919; letter from J.B. Mortsolf, superintendent, Hoopa Valley agency, to Fred Wilson, Klamath allottee, Stirling City, CA, 29 May 1922; Newell et al., *A Forest in Trust,* 4–20.
68. Letter from J.B. Mortsolf, superintendent, Hoopa Valley agency, to commissioner of Indian affairs, Washington, D.C., 10 August 1910; Roberts et al., *Indian Land and Forest Resources: An Issue of Trust,* 122, 135.
69. Ibid., 160.
70. Prucha, *The Great Father,* 987.
71. Newell et al., *A Forest in Trust,* 4–20.
72. The 1944 Sustained Yield Forest Management Act authorized the secretary of the interior and the secretary of agriculture to enter into long-term agreements with private forest owners whose lands were interspersed among federal lands so that the entire forest region could be managed in a single unit. However, the BIA never utilized the provisions of this act because of special conditions on the various Indian reservations. Roberts et al. *Indian Land and Forest Resources: An Issue of Trust,* 3–26.
73. Fortmann and Fairfax, "American Forestry Professionalism in the Third World."
74. J.P. Kinney, *A Continent Lost—Civilization Won: Indian Land Tenure in America* (Baltimore: Johns Hopkins Press, 1937); Newell et al., *A Forest in Trust,* 4–20.
75. Ibid.
76. Current convention uses a different spelling for the place, "Hoopa Valley," as opposed to the tribal group, the "Hupa."
77. "Treaty of 1851 between Redick McKee, Indian Agent on the Part of the United States, and the Chiefs, Captains, and Head Men of Pohlik or Lower Klamath &c Tribes of Indians," in *Indian Affairs, Laws, and Treaties,* comp. C.J. Kappler (Washington, DC: U.S. Government Printing Office, 1903–29).
78. Roberts et al., *Indian Land and Forest Resources: An Issue of Trust,* 156.
79. U.S. Soil Conservation Service, *Reconnaissance Survey of the Hoopa Valley Indian Reservation,* 3.
80. Newell et al., *A Forest in Trust,* 4–23.
81. Indian Forest Management Assessment Team for the Intertribal Timber Council (IFMAT), *An Assessment of Indian Forests and Forest Management in the United States* (Portland, OR: Intertribal Timber Council, 1993).
82. Luana Branter, letter to Leonard M. Hill, director, Department of Indian Affairs, area office, Sacramento, CA. Orick, California, 1 February 1955.
83. Bureau of Indian Affairs correspondence files, 1955–1985, Klamath Substation, Klamath, CA.
84. Reed and Sugihara, "Northern Oak Woodlands," 62.
85. Gross, *Contemporary Federal Policy toward American Indians,* 1–34.
86. Matthew C. Snipp, "American Indians Today," in *National Rural Studies Committee: A Proceedings,* 14–16 May, Las Vegas, New Mexico, ed. Emery Castle

and Barbara Baldwin (Corvallis, OR: Western Rural Development Center, Oregon State University, 1992) 16–26.

87. IFMAT, *An Assessment of Indian Forests and Forest Management in the United States.*

88. Kathy Heffner, *Following the Smoke, Contemporary Plant Procurement by the Indians of Northern California* (Eureka, CA: Six Rivers National Forest, 1984).

89. Beverly LeBeau, Pit River tribe, in *California Indian Basketweavers Association Newsletter* 4 (January 1993).

90. River trip of 13 June 1994.

91. Reed and Sugihara, "Northern Oak Woodlands," 61.

92. Fortmann and Fairfax, "American Forestry Professionalism in the Third World."

93. M.W. Murphree, *Communities as Resource Management Institutions,* 8.