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son's main work, has been included. In all, the volume is a memorable tribute to a highly respected and well-rounded archaeologist at the peak of his career.



Before the Wilderness: Environmental Management by Native Californians. Thomas C. Blackburn and Kat Anderson (compilers and editors). Menlo Park: Ballena Press Anthropological Papers No. 40, 1993, 476 pp., 53 figs., index, \$41.50, (hard cover), \$31.50 (paper).

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Before the Wilderness is a collection of 15 papers on environmental management by Native Americans in California (including two papers on Great Basin groups). Seven of these papers have previously been published. Of the remainder, the first is an introduction, six are revised and expanded versions of papers first presented at the California Indian Conference in 1991, and the final paper is a retrospective on the study of native burning and environmental management studies. Although I am not a fan of volumes of reprints, those reprinted here, including Lewis' seminal paper "Patterns of Indian Burning . . .," are relevant to the theme of the book and add depth to the subject (but are not reviewed herein). The technical aspects of the printing and binding of the book are quite good. I especially appreciate the retypesetting of the reprinted papers, eliminating the quality problems when reprinting old copies of pages and illustrations. The index is most useful.

The Introduction (by Blackburn and Anderson) discusses the increasing "appreciation for

the diversity and potential complexity of non-agricultural economies" (p. 15) and the research being conducted on the subject. They point out that California contained the largest hunter-gatherer population in North America, that California researchers have long recognized the importance of environmental management in the state, and that the rest of the discipline has ignored California. The purpose of this volume is to redress these problems, to illustrate some of the initial research on the subject, and to make the current scope of California environmental management research available under one cover.

The use of the term *domestication* to refer to control over the environment, rather than the more traditional definition applied to plants and animals of agricultural societies, may open some new ways of looking at the relationships between all peoples and the environment. Control is the key issue: whether that control is reproductive (the traditional definition of domestication), managerial (e.g., of communities rather than individuals), or through less tangible means (e.g., classificatory or ritual systems), it is control nonetheless, and understanding its systems is a prerequisite to understanding the cultures involved. The Introduction concludes by suggesting a number of research avenues that needs to be explored to further our understanding of native environmental management: (1) habitat reconstruction; (2) experimental data; (3) the development of quantitative models; and (4) the study of floristic anomalies. Good advice.

The first original contribution is "Native Californians as Ancient and Contemporary Cultivators" by Kat Anderson, who describes and discusses some native approaches and impacts to resources, including gathering, cultivation (not to be confused with agricultural domestication), burning, tillage, and conservation. The thrust of the paper is that native systems of resource management were and are complex and sophisticated, that we still have a great deal to learn

about them, and, perhaps as important, that we all can benefit from that knowledge.

The next original paper is by Bev Ortiz on "Contemporary California Indian Basketweavers and the Environment." Ortiz first describes some traditional approaches to managing and obtaining basket materials (e.g., conservation, scheduling, harvesting), then moves into a discussion of contemporary issues affecting basket materials and weavers. These issues relate primarily to the widespread environmental changes induced by Euroamericans over the past 150 years. These problems include development (e.g., roads, buildings, dams, farming), restrictions on access to both public and private lands, the use of herbicides and pesticides, competition from commercial collectors, burning restrictions, contamination of traditional gathering areas, and safety considerations. As a result, it has become very difficult to obtain traditional basketmaking materials. Ortiz notes some progress in solving these problems, but cautions that additional progress will require a broader public understanding of native land management practices, both past and present.

The third original paper is "Managing Oaks and the Acorn Crop" by Helen McCarthy. McCarthy notes (pp. 213-214) acorn crop management has three interrelated goals: "(1) an optimal growing environment; (2) a maximum number of producing trees in a suitable location; and/or (3) a maximum crop production," and that California Indians used a variety of techniques to achieve these goals. She then provides a brief discussion of oak species, distribution, and productivity. McCarthy discusses three major aspects of oak management: planting, knocking, and burning. Planting involves the actual planting of seeds or transplanting of small seedlings, a practice well-established for some other plants, such as tobacco. McCarthy argues that acorn planting likely was not done, owing to the length of time it takes for a tree to mature and to the uncertainty of crop production.

Knocking involves the use of poles to knock acorns to the ground. This constitutes a form of pruning with the removal of dead wood and associated contamination. While there may be deleterious effects from knocking (damaging the new buds for the next year's crop), McCarthy argues that, overall, it is an effective management tactic if for no reason other than to collect the acorns before they fall naturally and are taken by other animals. Burning is the most effective form of oak management: it suppresses conifer and brush competition, reduces pests, lowers the possibility of catastrophic burning, and keeps the ground clear, making it easier to collect acorns.

McCarthy then discusses spiritual and ceremonial practices involved in oak management. These include a positive spiritual relationship between people, land, and resources that operates on a daily basis and requires both respect and regular use of the resources. Non-use of resources breaks the relationship and the resources diminish. Ritual control of rain also is an important factor as is the annual fall acorn ceremony.

The next paper, by Glen Farris, is entitled "Quality Food: The Quest for Pine Nuts in Northern California." Farris briefly discusses the general importance of pine nuts in California and provides data on their nutritional value. He then outlines some methods used for the procurement and processing of grey and sugar pine nuts and notes some oral tradition data regarding the procurement and value of pine nuts. While such information is useful, I do not see where Farris clearly relates it to the *management* of pine nuts.

The fifth original paper is "Fuel Use and Resource Management: Implications for the Study of Land Management in Prehistoric California and Recommendations for a Research Program" by Chester King. King begins by noting that fuel is a resource critical to all human societies, but that no systematic study of fuel use or management has been conducted for any

North American Indian group. He then briefly notes some ethnographic data relating to Chumash and Yokuts firewood procurement, and discusses some archaeological cooking features from two Ventura County sites that contained identified wood fuel remains (not surprisingly, from locally available species). King makes a number of suggestions to archaeologists regarding wood identification, hearth dating, and hearth temperature measurements. He suggests that experimental wood gathering be done to measure sustainable yields of firewood and to discover optimum harvest rates. Further experiments are encouraged to determine how much fuel would be needed to replicate archaeological cooking features so a better idea of need and usage in prehistory can be determined. King argues that burning practices used for the management of other resources may have been detrimental to the firewood resource, necessitating some balance of practices. He further suggests that chaparral communities may have been managed, particularly after about 2,500 B.P., for fuel resources.

The sixth original paper is "Kumeyaay Plant Husbandry: Fire, Water, and Erosion Management Systems" by Florence Shipek. She summarizes the Kumeyaay plant husbandry-agricultural system, emphasizing that the native system survived until fairly recently (in northern Baja California) and that her consultants had first-hand knowledge of the practices. Of interest is the now-extinct (and unidentified) native grain that was a very important food plant. Shipek describes the gradual loss of the plant as the Kumeyaay lost control of their landscape. Archaeological research may be able to identify this plant, thus enriching the modern Kumeyaay. Shipek then describes Kumeyaay practices of water and erosion management, including check dams, rock alignments to disperse silt and water

runoff, sowing of certain plants to anchor loose soil, methods to prevent excessive erosion of drainage channels (to prevent a lowering of the water table and to create wet meadows), and spring alteration and maintenance. Shipek argues that the necessary bureaucracy and labor force to implement this system did exist. She then discusses some of the Euroamerican "management changes" that resulted in the destruction of the Kumeyaay system and alteration of the landscape.

The final original paper, "In Retrospect" by Henry T. Lewis, reviews the development of the study of fire as a management tool by hunter-gatherers. This paper provides insight into Lewis's interest and pursuit of the subject of burning. Lewis also discusses the generally unrecognized sophistication of indigenous management techniques (a theme in all the papers), Western elitism and ethnocentrism regarding the incorporation of such knowledge into Western management systems, and the equally ethnocentric view of hunter-gatherers as "primitive."

It is valuable to have published the six California Indian Conference symposium papers and the retrospect by Lewis; they add considerably to our understanding of Native Californian environmental management and the book makes an important contribution. The major theme running through the book is that precontact California was an altered and managed landscape, not the "untamed wilderness" that the Euroamericans considered it, a view that has changed little. Aboriginal knowledge of environmental management systems still exists and is even incorporated into park management in Australia. Whether this will happen in North America is open to question, but there is hope. Native groups successfully managed their landscape for thousands of years; we can still learn much from them if we are willing to listen.

