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Curriculum on Ecology and Natural Resource Management for Indian Natural Resource Workers

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Mythical cosmologies are not the attempts of savages to explain in fantasy where empirical knowledge of reality is absent, but are rather the opposite—statements in allegorical form about knowledge of the interrelations between what we would call natural, psychic and cultural aspects of reality. Myth and science are polar opposites, not because one is wrong and the other right, but because myth portrays reality as it is experienced while science postulates a reality that is thought to exist but can never be experienced. Myth unveils what is known to be true, while science experiments to build realities that are thought not to be untrue. Myths through their symbols allow men to enter directly and experientially into the realm of meaningful reality.[1]

INTRODUCTION

There are over a dozen Indian reservations in California encompassing several hundred thousand acres on which management of natural resources (timber, fish, wildlife, soils, minerals) is an important activity. While in the past much of this management was performed by Bureau of Indian Affairs tech-

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nical staff on behalf of Indian owners, there is an increasing tendency and necessity for tribes to assume more of this responsibility themselves. This trend is exemplified in California by the pursuit of self-governance powers by some tribes (e.g., Hoopa, Karuk, Yurok), contracting for natural resource management by others under Public Law 93-638—the Indian Self-Determination and Educational Assistance Act of 1975—(e.g., Round Valley, Tule River, Campo), and formation of advocacy groups such as the California Indian Basketmakers Association and the California Indian Forest and Fire Management Council.

The demand for qualified natural resource workers of Indian descent has increased in California and nationally, but many Indian people currently working in reservation natural resource programs have limited educational background in ecological and environmental sciences. For example, in 1994 the senior author (Harris) interviewed all employees at the Hoopa Reservation Forestry Department and asked them about their educational background. Among Indian employees, only the department head had a college degree; none had completed forest technician programs at community colleges. Other management personnel with college degrees were non-Indian. Most of the twenty-plus Indian forestry technicians and paraprofessionals at Hoopa had not taken college-level courses in ecology, environmental science, or natural resource management. This situation appears to be common throughout California and on many other reservations throughout the United States.

Indian students who wish to pursue higher education in natural resources and ecological or environmental sciences can find opportunities both inside and outside California. Several tribal colleges, including D-Q University at Davis, College of the Menominee Nation in Wisconsin, and Haskell Indian College in Kansas have developed, or are in the process of developing, natural resource curricula specifically tailored for Indian people. Humboldt State University in Arcata and Northern Arizona University in Flagstaff also offer four-year natural resource programs designed for Indian people. Some courses at these institutions incorporate Indian knowledge of nature in their curricula. For example, Dr. Chuck Haines at Haskell Indian College has developed courses on biology and botany that heavily utilize ethnobotanical information from the region and tribes around Haskell College.[2]

There is a need, however, that is not being met by existing institutions for the in-service education of Indian people who are currently employed in natural resources and who, at least for the present, do not envision enrollment in a conventional college program. For these people the need is perhaps greater than for the conventional student. These are the people who are now actually doing the work: measuring the resources, harvesting and managing the forests, performing the day-to-day business of working in nature. In California alone, on the fourteen larger reservations that have natural resource programs, about one hundred people fit into this category.[3] Although there are continuing education opportunities available through professional organizations and colleges, most focus on specific aspects of management or measurement without providing a comprehensive context and background in ecology, ecosystems, and natural resources. These courses are offered at places far from the reservations, and there are virtually no in-service continuing education courses that are specifically oriented to Indian people.

The California Indian Forest and Fire Management Council, a consortium of fourteen tribes, and the Bureau of Indian Affairs, Sacramento Area Office, Forestry Branch have identified education in natural resources as a high priority. In 1994 a contract between the Forestry Branch and the University of California, Cooperative Extension, Forestry was signed. The objective of this contract was to develop a curriculum on ecosystem science and management specifically tailored to Indian natural resource workers. The curriculum was to be self-paced, designed for home study, and assumed no previous college background. The curriculum was to blend traditional knowledge of ecology and management, as gleaned from diverse sources, with Euro-American scientific principles to create a culturally appropriate course. Our work on the curriculum has introduced us to the fascinating subject of Indian ecological knowledge. A first draft of the curriculum has been completed and published,[4] but we have already seen the need for improving it by further integrating this knowledge into it. In this paper, we outline the major concepts underlying the development of the curriculum and discuss our present efforts to improve it and extend it to users.

CURRICULUM DEVELOPMENT CONCEPTS

A student of natural resource sciences spends years taking courses in basic biology, environmental science, and management science before a degree is conferred. Considering the needs of the working Indian natural resources technician, we begin by asking: "What is the essential foundation of knowledge that Indian natural resource workers should possess?" We have approached this question in two ways. First, some absolutely essential content such as basic ecology, components of the environment, and the methods for surveying and measuring ecosystems should be learned. The content should also include a review of management approaches; conservation versus exploitation without undue emphasis on the negative environmental aspects of development; laws and regulations affecting resource use and protection, illustrated with case studies; and the roles of people in ecosystems. Given these general ground rules on content, our second major premise is that historical and current Indian ecological knowledge should be treated on an equal footing with Euro-American ecological and environmental sciences. Overall, the aim is to provide an integrated body of information which will allow natural resource workers to understand more clearly how their work fits in with natural resource management. By emphasizing the diversity of traditional and contemporary Indian knowledge and examples, the intent is to make this course both appealing and useful to Indian people. Upon completion of the course, a student might be stimulated to study further in one or more of the subject areas.

We felt that it would be most useful if the course content is demonstrated and reinforced by testing and competency-assessment procedures that require students to put the knowledge to use in the context of the workplace. This hands-on approach brings a practical element to the course that we hope will make it attractive both to students as well as tribal authorities who may be asked to permit student participation. The rewards for completing the course, in addition to an increased understanding of basic ecology and management principles, could include recognition by the student employee's tribe and/or college credit.

As developed to date, the curriculum includes a syllabus and lecture notes, high-quality graphics and slides, assignments for testing competencies, and a course reader. Its format will allow it to be taught in any one of three ways: as a four to

six week short-course, as a distance-learning correspondence course, or as a semester-long undergraduate course. The curriculum outline is as follows:

1. People in Ecosystems
2. Basic Ecology
3. The Environment
4. Organisms and Communities
5. Ecosystem Planning and Regulation of Uses
6. Ecological Measurement

Review copies have been sent to several tribal colleges for possible incorporation into their programs (with local modifications) as an accredited course (additional copies may be obtained from the senior author). Plans are underway to offer the course in distance-learning and short-course modes. Course reviewers have raised some issues regarding the technical accuracy of scientific content and sufficiency of Indian resource management examples.[5] Others have questioned the logistics of distance learning and the need for student peer support.[6] We feel that it is only possible to disclose and solve problems like this through actual use of the course. As with any course, this one will develop and improve with use. Unfortunately, federal funding for Indian education has declined precipitously under current congressional mandates, a situation that may delay implementation in any format. It has been our assumption that the course should be offered at little or no out-of-pocket expense to students and should make use of materials and resources which are readily available locally.

CURRICULUM KNOWLEDGE BASE

Natural resource education in the United States is biased in favor of the predominant cultural wisdom: Euro-American science. This can be confirmed by reviewing any textbook on environmental science or natural resource management. The very terms *natural resource* and *management* imply utilitarian concepts of property that on the whole are alien to traditional Indian thought.[7] Euro-American science-based natural resource management is a rather recent invention, developed mostly over the past fifty years, and during that period it has

changed considerably. Paradigms of management are being questioned by scientists[8] and by the public. New ideas of landscape ecology, biodiversity, and ecosystem management are as much a product of present conflict over how resources have been managed as they are a reflection of evolving science. Each of these "scientific fields" has its own terminology and supporters. None has a substantive empirical knowledge base. Moreover, Euro-American science, being based on objectivity contains little useful guidance on the important subject of peoples' ethical and moral obligations to nature.

There is, nevertheless, much merit in Euro-American disciplines of ecology, environmental science, and natural resource management that Indian natural resource workers need to know to do their jobs and to communicate effectively with peers, both Indian and non-Indian. Furthermore, Indian people need to understand the laws and regulations which have been created on the basis of Euro-American science that apply to Indian country, including their substantive and procedural aspects. For the ethical and spiritual basis of how people relate to nature, their own traditions are an unsurpassed source of inspiration.

Indian knowledge of nature developed empirically over thousands of years. It is based on detailed observations of phenomena by people living in nature as part of it. It has practical and moral dimensions and is uniquely subjective, dealing with people in places. To illustrate its unique pragmatism, the lifeways of hunting can be used as an example. Suzuki and Knudtson state:

> Survival based on hunting demands an intimate understanding of the natural history of wild animals. It requires a familiarity with the minute details of their daily activities and habitat preferences. It depends on a keen sense of their breeding cycles, migratory patterns and feeding preferences. It relies on finely tuned insights into their modes of communication, their sensory capacities, the seasonal changes in their behavior and appearance, and their particular vulnerabilities to human approach and attack. Such breadth and depth of knowledge grants the hunter a degree of daily intimacy and potential long-term empathy with the mental lives and survival experiences of fellow animal species that might otherwise be unimaginable.[9]

Indian ecological knowledge is not a substitute for Euro-American science but rather a complement to it. In searching for

sources of Indian ecological knowledge complementary to Euro-American sciences, we have generally confined our research to North American Indian people, although a wealth of knowledge of other indigenous groups exists throughout the world. We have identified eight categories of knowledge sources:

1. Myths and legends (more appropriately called teaching stories since they are only mythical in relation to Euro-American worldview)[10]
2. Ceremonies and ritual practices[11]
3. Visual arts (e.g., rock art, historical and contemporary)[12]
4. Dance, music, and drama[13]
5. Verbal testimony, both modern-day and historic[14]
6. Medicinal and healing arts[15]
7. Scholarship by both Euro-Americans and Indians
8. Instructions on procedures for management and use, which often have ritual and ceremonial elements[16]

We have incorporated many examples from these sources into our present curriculum while further investigating each for additional relevant ideas and examples. This body of knowledge is not static, but growing due to the continual "discoveries" by researchers, reevaluations, contemporary testimony, and innovations of today's Indian natural resource managers and environmental leaders. Since most of the historic and prehistoric knowledge is encoded in symbols and languages other than English, we have to depend on secondary sources. There are both good and bad interpretations of Indian ecological knowledge, and controversy and disputes over the interpretation of this knowledge take place among scientists and between scientists and Indian people. Some past interpretations and conclusions are currently being reevaluated, for example, the subject of game exploitation by Indians, which was investigated in some depth by Calvin Martin.[17] Problems of cultural bias and editorial influence by the Anglo conveyers of Indian knowledge have been recognized.[18] Given the problems of using secondary sources, we have concluded that contemporary Indian sources are probably the most reliable and straightforward. Directly transmitted historical knowledge of elders and others in English is also valuable, although some might claim that these elders themselves are subject to cultural

bias. Direct transmittal in Native languages is accessible only to those who speak or read the languages, while direct transmittal of medicinal and healing arts focused on the use of plants and animals (e.g., ethnobotany) is already widely used in natural resource education for Indian students. Among the historic and prehistoric sources, rock art presents interesting possibilities.[19] The least promising sources appear to be uncorroborated interpretations of myths, ceremonies and practices, and performing arts.

A curriculum on ecology and ecosystem management for Indian people should draw the best from Euro-American and Indian knowledge sources, giving equal weight and respect to both. An emphasis should be placed on synthesis and complementarity rather than conflict and divergence. Together, these two sources can provide an Indian person with a foundation and appreciation for the best of both. Indian knowledge in particular provides moral and ethical principles for applying systems of management to the earth and its creatures. Native ecological knowledge cannot be separated from spirituality. It assigns tremendous responsibility to people for sustaining harmonious relationships with the entire natural world.[20]

AN EXAMPLE OF COMPLEMENTARITY

To demonstrate the approach we are taking to the development of curriculum we will use one of the basic symbols in ecological science: the trophic pyramid (figure 1). This symbol depicts the reciprocal relationships among all living things and their environment. The broad base of the pyramid represents the environment upon which all life depends. Successive levels depict the plant-producers, herbivores that feed on plants, and consumers that feed on herbivores and possibly also plants (omnivores, like people). The declining size of successive tiers on the pyramid represents changes in mass and productivity at each level. The trophic pyramid can be used to teach productivity, decomposition, nutrient and energy cycles, and food chains and food webs in ecosystems. It is as elegant a symbol as Euro-American science has to offer and in itself is relatively free from cultural bias (except for the shape!). It is a useful tool for interpreting the effects of people's activities on ecosystems. For example, the important process of bioaccumulation, by which toxic elements proceed through food chains and eventu-

ally reach top consumers, can be easily taught and understood by using the trophic pyramid.

The concepts underlying the trophic pyramid—reciprocity, interdependence between all forms of life—have been central to Indian behavior in nature for millennia. It could be considered the Euro-American scientific and objective symbol for the intensely personal Indian concept expressed as "all my relations." Many, many myths, ceremonies, and rituals express this body of knowledge. It underlies many of the things Indian people do today[21] and has been eloquently explained by both historic and contemporary Indian leaders. Oren Lyons, an Iroquois environmentalist and leader, summarized this perspective:

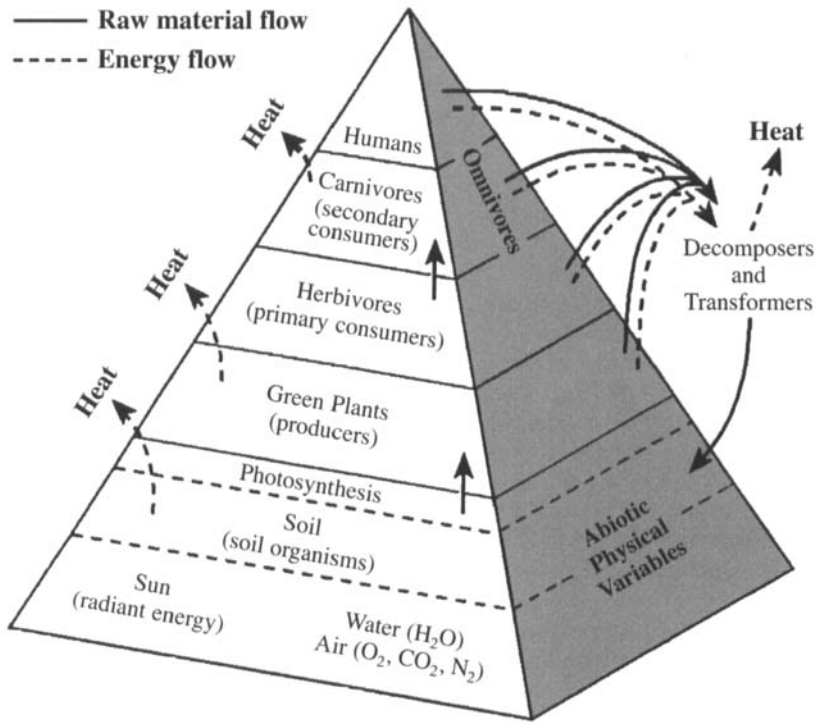

Figure 1

The trophic pyramid is a graphical representation of the relationships among living things in ecosystems. Redrawn with permission from D.A. Castillon, *Conservation of Natural Resources: A Resource Management Approach* (Dubuque, IA: Wm. C. Brown Publishers, 1992), fig. 1.13, p. 16.

> In the beginning we were told that the human beings who walk about on the Earth have been provided with all the things necessary for life. We were instructed to carry a love for one another, and to show a great respect for all beings on the Earth. We were shown that our life depends on the well-being of the vegetable life, that we are close relatives of the four-legged beings.
>
> The original instructions direct that we who walk about on the Earth are to express a great respect, an affection and a gratitude toward all spirits which create and support Life. When people cease to respect and express gratitude for all these many things, then all life will be destroyed, and human life on this planet will come to an end.[22]

Trophic pyramids have a fundamental usefulness to people concerned with natural resource management. The symbol is not only easily interpreted, but can be quantified for specific ecosystems and therefore represents a testable hypothesis. Few people have better used the concepts underlying the trophic pyramid and food chain to describe exploitation than Lame Deer, a Lakota elder:

> The gold in the Black Hills, the gold in every clump of grass. Each day you can see ranch hands riding over this land. They have a bagful of grain hanging from their saddle horns, and whenever they see a prairie-dog hole they toss a handful of oats in it....Only the oats for the prairie dogs are poisoned with strychnine....Prairie dogs are poisoned because they eat grass. A thousand of them eat up as much grass in a year as a cow. So if a rancher can kill that many prairie dogs he can run more head of cattle, make a little more money. The bobcats and coyotes which used to feed on prairie dogs now have to go after a stray lamb or crippled calf. The rancher calls the pest control officer to kill these animals....And the prairie becomes a thing without life—no more prairie dogs, no more badgers, foxes, coyotes. The big birds of prey used to feed on prairie dogs too. So you hardly see an eagle these days. The bald eagle is your symbol.... When people begin killing off their own symbols they are in a bad way.[23]

In the context of a curriculum that integrates knowledge, the trophic pyramid is a useful basis for explaining how ecosystems work. It is relevant to production and consumption relationships within ecological communities. It has no ethical dimension. Complementary Indian knowledge such as the two

presented here (and there are many more examples) provides both an ethical viewpoint (Lyons) and demonstrates the application of the trophic pyramid to real natural resource management issues in Indian country (Lame Deer). Lame Deer's story could be extended to explain the endangerment of species such as the blackfooted ferret that lives with and depends upon prairie dog prey. That then leads naturally into a discussion of the Endangered Species Act.

The concept of the trophic pyramid or food chain is also a useful tool for teaching people about their own cultural history and lifeways. Scholarly work on Indian ecological subsistence patterns can be used to supplement direct Indian source materials. Heizer and Elsasser[24] present a series of subsistence diagrams for California tribes (figure 2). If we focus on an ecological interpretation of the place in which the Pomo live, the dia-

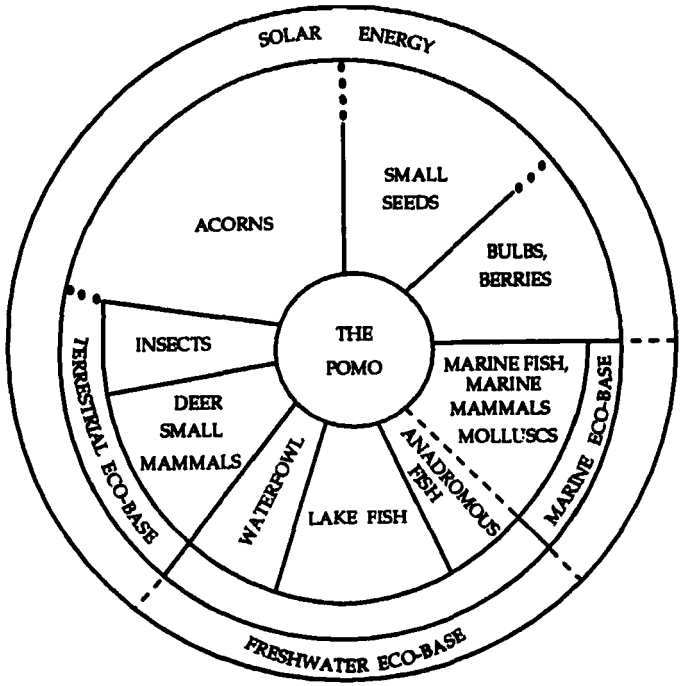

Figure 2

Food resource or subsistence diagram for the Pomo tribe, Northern California. Redrawn with permission from R.F. Heizer and A.B. Elsasser, *The Natural World of the California Indians* (Berkeley, CA: University of California Press, 1980), fig. 45, p. 81.

gram is a rich teaching tool. It is really a two-dimensional trophic pyramid (in a perhaps more culturally appropriate circle). It shows, for example, that nearly half of the Pomo food source is terrestrial vegetation. Proximity to both lakes and the sea is indicated by Pomo reliance on other food sources. If a student were asked, "What ecosystems are found in Pomo territory?" the diagram could be used to reveal a mosaic of oak woodland, grassland, lakes, and rivers flowing to the sea and ocean. Thus, this simple symbol contains a description of a place, patterns of use, and close dependence of a people on the resources of that place. Any student anywhere should be able to deduce this information.

After studying this diagram and others (Heizer and Elsasser present four that represent radically different ecosystems and lifeways), students can then be asked to construct a similar trophic diagram for their own place and people. This format is the one we have chosen for assignments testing competency with a concept. It both illustrates the concept as well as makes the concept place-specific.

This is but one example of complementarity between knowledge from Euro-American and Indian sources. Our efforts have been to develop these for a variety of basic ecological and environmental topics. There are definite gaps; explicit treatments of ecological topics are especially rare in myths, ceremonies, and art. As discussed below, we are presently conducting further research into the exceptional Indian materials.

FUTURE DIRECTIONS

In addition to extending the present curriculum to potential users, we are presently continuing work on the synthesis of knowledge. We are encouraged by others who have demonstrated parallels between Indian knowledge and Euro-American scientific theories and concepts. For example, Suzuki and Knudtson[25] have used creation myths to illustrate correspondences between the so-called big-bang theory of world creation and Indian ideas of how the world began. Our review of mythology has led us to conclude that there is little of direct use—especially in consideration of the fact that most myths, when translated into English, probably contain cultural biases of the anthropologists who collected the myths. We continue to seek direct observations and recording of Indian ecological

behavior. For example, descriptions of ceremonies such as the first salmon ceremony among Pacific Northwest tribes contain much information for drawing parallels between Indian and Euro-American ecology.

The work of people like Dr. Chuck Haines at Haskell Indian College, Dr. Kat Anderson at the California Academy of Arts and Sciences, and other ethnobotanists has created a large body of knowledge on Indian uses of plants that can be incorporated as examples into a foundation curriculum. Anderson's work in particular addresses traditional management practices.

We have been conducting a review of the literature on rock art as a source of ecological knowledge. So far we conclude that ecological symbolism is difficult to interpret from this wonderful material. Some researchers claim that the majority of rock art is either shamanic in origin or associated with "hunting magic."[26] Most are reluctant to interpret meaning. Clearly, many examples of rock art in California and elsewhere are concerned with astronomical events, particularly the winter solstice, an important time of change. Shamans appear to have used rock art for environmental purposes. For example, the Chumash have a story of rock painting being used to prevent rain.[27] We acknowledge the need to approach interpretation with caution.

One of the richest sources of Indian ecological knowledge is the historical and current testimonies of Indian environmental leaders. Some of this material is disputable (e.g., Chief Seattle), but much more is a reliable source of examples and principles. These leaders often state a compelling case for environmental ethics:

> What of the rights of the natural world? Where is the seat for the buffalo or the eagle? Who is representing them...? Who is speaking for the waters of the earth? Who is speaking for the trees and the forests? Who is speaking for the fish, for the whales, for the beavers for our children? We are indigenous people to this land. We are like a conscience; we are small, but we are not a minority; we are the landholders, we are the land keepers; we are not a minority, for our brothers are all the natural world, and for we are by far the majority. It is no time to be afraid. There is no time for fear. It is only time to be strong, only a time to think of the future and to challenge the destruction of your grandchildren.[28]

Other important sources of knowledge, currently used as case studies in the curriculum, are the present practices of

tribes and associations. In California, the Hoopa, Yurok, Karuk, and other tribes have instituted innovative environmental management practices on their lands and in their ancestral territories that reflect a blending of traditional and modern scientific knowledge. Outside California, good sources of information include the Menominee, Yakima, and Zuni tribes, among many others which we in no way mean to slight by not mentioning. Our future efforts will be to strengthen the curriculum by gathering more contemporary examples of the practical application of ecological knowledge by Indian land managers.

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NOTES

1. R. Ridington and T. Ridington, "The Inner Eye of Shamanism and Totemism," in D. Tedlock and B. Tedlock, *Teachings from the American Earth* (New York: Liveright, 1975), 190-204.

2. Charles E. Haines, Jr., *Native American Traditional Knowledge and Science* (draft curriculum), (Lawrence, KS: Haskell Indian Nations University, 1995).

3. Data on employees at reservations who are members of the California Forest and Fire Management Council obtained by telephone interviews during

August 1995.

4. Richard R. Harris, *Ecosystems and Indian People: A Curriculum on Ecosystem Science and Management for Indian People Working in Natural Resource Management*, Volume 1 "Syllabus and Lecture Notes," Volume 2 "Assigned Readings" (Berkeley, CA: Department of Environmental Science, Policy, and Management, Cooperative Extension Forestry, University of California, 1995).

5. Paula Huff, College of the Menominee Nation, personal communication, November 1995.

6. Joan Wright, Department of Applied Behavioral Sciences, University of California, Davis, personal communication, November 1995.

7. William Cronan, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983). Cronan discusses the misunderstanding of private property among Indian people leading to widespread losses of territories. This subject has been explored in California by Lynn Huntsinger in her research at the Yurok reservation; see Lynn Huntsinger and Sarah McCaffrey, "A Forest for the Trees: Forest Management and the Yurok Environment, 1850 to 1994," *American Indian Culture and Research Journal* 19:4(1995): 155-192.

8. See Daniel B. Botkin, *Discordant Harmonies* (New York: Oxford University Press, 1990); and Chris Maser, *The Redesigned Forest* (San Pedro, CA: R. & E. Miles, 1988).

9. D. Suzuki and P. Knudtson, *Wisdom of the Elders* (New York: Bantam Books, 1992), 99.

10. Suzuki and Knudtson refer to myths as possible transmitters of encoded ecological knowledge. Some good source material is found in Julian Rice, *Lakota Storytelling* (New York: Peter Lang, 1989); and R. Erdoes and A. Ortiz, *American Indian Myths and Legends* (New York: Pantheon Books, 1984).

11. See Erna Gunther, "Analysis of the First Salmon Ceremony," *American Anthropologist* 38(1926): 605-617.

12. See Polly Schaafsma, *Indian Rock Art of the Southwest* (Albuquerque: University of New Mexico Press, 1980); Jo Anne Tilburg, *Ancient Images on Stone, Rock Art of the Californias* (Los Angeles: University of California, Los Angeles, Institute of Archeology, 1983).

13. Many dances, such as the brush dance of Northwestern California tribes, include movements that are apparent mimicry of animal behavior. Animal parts are an important part of the regalia used in such dances.

14. See D.M. Dooling and P. Jordan-Smith, *I Become Part of It* (New York: Parabola Books, 1989); Oren Lyons, "Our Mother Earth," *Parabola* 7:1(Winter 1984): 91-93; and Suzuki and Knudtson, *Wisdom of the Elders*.

15. See Lucy Thompson, *To the American Indian* (Berkeley: Heyday Press, 1991).

16. See T.C. Blackburn and K. Anderson, *Before the Wilderness: Environmental Management by Native Californians* (Menlo Park, CA: Ballena Press, 1993); R. Boyd, "Strategies of Indian Burning in the Willamette Valley," *Canadian Journal of Anthropology* 5(1986): 65-86; and "Resource and Sanctuary,

Indigenous Peoples, Ancestral Rights and the Forests of the Americas," *Cultural Survival Quarterly* 17:1 (Spring 1993).

17. Calvin Martin, *Keepers of the Game: Indian-animal Relationships and the Fur Trade* (Los Angeles: University of California Press, 1978); also S. Krech III, ed., *The Subarctic Fur Trade: Native Social and Economic Adaptations* (Vancouver: University of British Columbia Press, 1984). For a provocative view of Indian effects on big game, see C.E. Kay, "Aboriginal Overkill: The Role of Native Americans in Structuring Western Ecosystems," *Human Nature* 5(1994): 359-398.

18. An example of the reinterpretation of Indian testimony is the work by M.F. Steltenkamp, *Black Elk: Holy Man of the Oglala* (Norman, OK: University of Oklahoma Press, 1993). That work turns to transcripts of interviews with Black Elk in an effort to avoid the editorial content of the original translator.

19. One of the only treatments of rock art that focuses on interpretation is LaVan Martineau, *The Rocks Begin to Speak* (Las Vegas: KC Publications). We have not reviewed this work in detail yet, but we are forewarned of its controversy.

20. Suzuki and Knudtson, *Wisdom of the Elders.*

21. R.L. Trosper, "Traditional American Indian Economic Policy," *American Indian Culture and Research Journal* 19(1995): 65-95.

22. D.A. Grinde and B.E. Johansen, *Ecocide of Native America* (Santa Fe, NM: Clear Light Publishers, 1995), 267.

23. J. Lame Deer and R. Erdoes, *Lame Deer Seeker of Visions* (New York: Simon and Shuster, 1972).

24. R.F. Heizer and A.B. Elsasser, *The Natural World of California Indians* (Berkeley, CA: University of California Press, 1980).

25. Suzuki and Knudtson, *Wisdom of the Elders.*

26. Jo Anne Van Tilburg, *Ancient Images on Stone; Polly Schaafsma, Indian Rock Art of the Southwest.*

27. Jo Anne Van Tilburg, *Ancient Images on Stone.*

28. Oren Lyons, *Our Mother Earth.*