Professor Leopold, What Is Education for?
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In Aldo Leopold's view, the essential purpose of education is to inform the citizen about his or her place in the ecosystem as a basis for the intelligent and sustainable use of lands and natural resources. This idea winds like a thread throughout the essays of Leopold's *A Sand County Almanac*. Leopold seemed to have a broad educational purpose in writing the essays: to inspire understanding, respect, and ethical reflection to counter society's destructive tendencies towards land and natural resources. Finch (1989:xxi), while noting the bitterness and pain in these essays, concluded that Leopold "remained convinced that most environmental mistakes are due, not to some inherent baseness in human nature, but to ignorance. He understood that his own ability to perceive and understand how nature works was the result of a long period of education and self-education." Leopold envisioned a broad and inclusive role for educators in society and for environmental education in the lives of the world's citizens.

For those of us who teach, Leopold's words are a challenge to continually examine our own knowledge and feelings about human–land relationships and to bring deep understanding into our roles as educators. Leopold saw a need for all people to understand their place in the natural world and to embrace land stewardship as a personal ethic. This view challenges us to extend our educational roles well beyond the boundaries of our universities and disciplines. Contained within *A Sand County Almanac* and other Leopold writings are ideas on how such educational aims might be achieved. Leopold's views on education included: a holistic approach to ecology and natural resources management, recognition of the need for application and personal experience to reinforce learning, connections to the land, integration of humanistic and scientific values, and ethical reflection. Although not the first or the only place where such ideas have been expressed, Leopold's writings are unique in being so widely read and accessible.
We examine the key ideas about education that Leopold conveyed in his writings and actions. We then speculate about how 1 of the most significant issues of the last half-century might have played out differently if Leopold’s ideas had become ingrained in the educational mainstream 50 years ago. Finally, we share our perspectives on the manner in which Leopold’s ideas are used in natural resources education today.

PROFESSOR LEOPOLD

Although highly respected and liked as a professor at the University of Wisconsin, Leopold was critical of contemporary university education and skeptical of its abilities to slow the deterioration of land and resources. In his essay “Good Oak,” the irony is hard to miss: “Now we cut 1910, when a university president published a book on conservation, a great sawfly epidemic killed millions of tamaracks, a great druth burned the pineries, and a great dredge drained Horicon Marsh” (Leopold 1989:11).

Leopold considered the land to be far more complex than a set of resources or a collection of individual plants and animals. He recognized the importance of ecological interactions and relationships. With respect to education, he was concerned about the fragmentation that existed among the different disciplines: “Education, I fear, is learning to see one thing by going blind to another” (Leopold 1966:168). His views on the need for integration and holism in education mirrored his ideas about the fundamental nature and workings of ecological systems. Leopold expressed his deep concern about the increasing specialization of professors in this criticism of universities: “There are men charged with the duty of examining the construction of the plants, animals, and soils which are the instruments of the great orchestra. These men are called professors. Each selects one instrument and spends his life taking it apart and describing its strings and sounding boards. This process of dismemberment is called research. The place for dismemberment is called a university” (Leopold 1966:162).

Leopold viewed a connection to the land as a necessary grounding for developing an understanding of how nature works and how it responds to human interventions. The time and effort invested in an old, abandoned farm on the Wisconsin River would eventually inspire the essays of A Sand County Almanac. One of the most frequently cited passages in A Sand County Almanac addresses the importance of connection: “I have read many definitions of what is a conservationist, and written not a few myself, but I suspect that the best one is written not with a pen, but with an axe. It is a matter of what a man thinks about while chopping, or while deciding what to chop” (Leopold 1989:68). Likewise, in his essay “Natural History,” Leopold (1966) expressed concern that much of what is taught is divorced from real-world application.

Leopold’s philosophy on education emphasized the need to include humanistic as well as scientific values—an approach that set him apart from both his predecessors and his contemporaries (Finch 1989:xxi). In his essay “The Geese Return,” Leopold described how he and his students determined that the lone geese they observed during spring migration were survivors whose mates had likely been killed in the previous hunting season. “Now I am free to grieve with and for the lone honkers. It is not often that cold-potato mathematics thus confirms the sentimental promptings of the bird-lover” (Leopold 1966:22). Leopold’s characterization of university faculty offered a biting critique of the separation of science from the humanities: “A professor may pluck the strings of his own instrument, but never that of another, and if he listens for music he must never admit it to his fellows or students. For all are restrained by an ironbound taboo which decrees that the construction of instruments is the domain of science, while the detection of harmony is the domain of poets” (Leopold 1966:162).

Leopold’s teachings included the need for ethical reflection on natural resource decisions and actions, and the flexibility to reconsider what may be “right” or “wrong” in view of those reflections. In “Thinking Like a Mountain” (Leopold 1989), he related an experience with a dying wolf that caused him to reflect on the wisdom of shooting these animals on sight. These reflections eventually would lead him to reformulate his views on predator control. Ever the student himself, he recognized the need to continually question his own precepts of right and wrong in light of experience and deep contemplation about the workings of the world. In fall of 1958, Leopold began to sign his letters “Professor of Wildlife
Management" instead of "Professor of Game Management" (Meine 1988); his reflections about the changing purpose and purview of the profession extended to his own self-identity.

A key message in all of Leopold's writings was the need for humility, respect, and love in people's relationships with nature. Leopold's land ethic relied upon individuals developing an "ecological consciousness" and assuming responsibility for the land. He considered love for the land to be a necessary element of a land ethic: "We can be ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in" (Leopold 1989:214). "It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value" (Leopold 1989:223). Leopold was also aware that ecological understanding—including respect and love for the land—came at a high cost: "One of the penalties of an ecological education is that one lives alone in a world of wounds....An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise" (Leopold 1966:197).

How would Leopold feel if he could examine universities today with respect to his critique of 50 years ago? He would probably have mixed emotions. Significant conservation gains have occurred in land-use policies, programs, and practices in North America, e.g., the Endangered Species Act (16 U.S.C. 1531–1544), designation of Wilderness Areas, and the Conservation Reserve Program. However, these gains more closely reflect the activism of individuals and interest groups than a movement (championed and nurtured by the universities) to institutionalize an "ecological consciousness." We expect that Leopold would be dismayed to find that, still today, "We may, in fact, be training idiot savants—individuals skilled in certain areas (in this case, the technical biological aspects of conservation) but largely inept in other aspects of the field" (Jacobson and McDuff 1998:265). The focus on individual disciplines and subjects rather than the integration of the whole continues to prevail in natural resources education. If you doubt this, consider the fate of a professor today who is so foolish as to specialize in interdisciplinary research before becoming tenured, or who might apply with an interdisciplinary degree to a wildlife biology, forestry, geography, political science, or economics department.

The way we teach ecology today, especially the de-emphasis on natural history and field observation, would certainly give Leopold pause. He would find that, although students may spend a few weeks doing field work (usually in good weather), most of their education takes place inside a building. The observation that most learning is from books, lectures, and computer screens rather than from personal experience in real-world problems would undoubtedly concern Leopold, who so highly valued a connection with the land.

Leopold would find that the integration of scientific observation with humanistic values, so prominent in his own writings, is still excluded in "mainstream" educational programs in natural resources. Fifty years after A Sand County Almanac, we seldom find ethical reflection and other humanistic qualities as learning objectives or instructional outcomes in the natural resources curricula (Kessler 1995). As in Leopold's day, discussions about right and wrong are largely relegated to religious studies and philosophy departments. The enlightened "love" of the land urged by Leopold cannot be mandated as required learning.

**WHAT IF...?—RETROSPECTION ON THE SPOTTED OWL**

How might things be different today if Leopold's ideas on education had taken hold and flourished in the 50 years since A Sand County Almanac? The possibilities for speculation are endless. Let's consider 1 of the most difficult and controversial issues since that time—the conflict between spotted owl (*Strix occidentalis*) conservation and forest harvesting—and imagine how it may have been influenced by Leopold's views on education. The history, causes, and lessons of this issue, thoroughly document by Yaffee (1994), provide broad insights into the character of disputes in natural resources today.

Analysis of the spotted owl controversy revealed several reasons for its severity and persistence, including the character of the issue...
itself. The issue was complex; the stakes were high for the different interests; there were uncertainties in the science, economics, and policy; and little room existed to craft a solution by the time the parties were willing to look for one (Yaffee 1994). Like most controversies in natural resources and environmental sciences, this issue turned out to involve a “multitude of subissues, so that seemingly simple choices [became] battles over a variety of other substantive, organizational, and political objectives” (Yaffee 1994:156). Although an important issue in its own right, the spotted owl dispute was also a symptom of greater, more complex concerns involving old-growth forests, resource-dependent communities, and the credibility of government bureaucrats and agencies.

The stakes in the spotted owl issue were immense. From an economic perspective, the old-growth forests required by the owl were the only source of timber to keep logging and milling operations (and dependent communities in the region) operating at sustainable levels. From an ecological perspective, the old forests represented a scarce, world-class biological resource that would be irreplaceable when cut. The media’s portrayal of the issue in black and white—people were either “for jobs and people” or “for the owl”—created extreme polarization and paralysis. Incomplete information and the urgency for decisions created anxiety and uncertainty for all involved. Initially, politicians viewed the “owl problem” as a simple matter that scientists, given enough research money, would be able to fix. It turned out to defy solution, however, because “under its surface were clashes of fundamental human values, that is, differences of opinion that are deeply held and unresolvable on objective ground” (Yaffee 1994:178).

Fragmentation in administrative authority, in land-use policies, in political jurisdictions, and in decision-making processes was a significant barrier to progress in achieving resolution. Attitudes of policy makers (“it’s not my problem”), managers (“my hands are tied”), and bureaucrats and legislators (“we’re dealing with it” [when we’re really not]) exacerbated the difficulties (Yaffee 1994). Along the way, the chief agency involved, the U.S. Department of Agriculture Forest Service, came to realize that its institutional values, norms of behavior, and culture were ineffectual—as were its organizational structure and administrative processes.

How might things have differed if Leopold’s ideas had been infused, through the universities, into an entire generation of natural resource professionals? To begin with, a holistic and integrated perspective might have enabled them to grasp the spotted owl issue—and all that it symbolized—in its entirety. Having been taught that complexity is the norm in ecology and natural resources management, the professionals would have recognized that this was not a simple biological problem requiring a technical fix. Presumably, a full array of social scientists, economists, ecologists, policy specialists, and others would have been enlisted from the start as members of the problem-solving team.

Those who were connected to the problem—including scientists, managers, educators, and affected citizens—would have been engaged early on to find common ground and search for alternative solutions. Thanks to decades of environmental education and outreach efforts by university faculty, natural resource professionals, and others, public understanding of ecology and natural resources would have been strong enough to reject the media’s characterization of the issue as black and white (jobs vs.
owls). We might even speculate that members of the media might have become ecologically literate enough to cover such issues in an informative and useful manner!

Resource professionals, many of whom filled high administrative and policy-making positions by the 1980s, would have reflected deeply on the issue with respect to their own ecological consciousness and ethical outlook on land, resources, and professional responsibility. Those who shirked responsibility or distorted the issue would not have been tolerated by the ethical and committed majority. Having received a natural resources education that included humanistic as well as scientific values, these leaders would have been more perceptive and empathetic toward the diverse views that comprised the spotted owl dispute. The various interests, in turn, would have placed more trust and confidence in their leaders to handle the issue in a fair, responsible, and intelligent manner.

If Leopold’s wish had really come true—and the masses had developed understanding, respect, and love for the land—we might speculate that the spotted owl issue would never have come about. The notion of managing forests so as to maintain their ecological integrity and biodiversity (“every cog and wheel”) would have become conventional wisdom by the late 1970s, when the issue began to heat up. Of course, the possibilities for speculation are endless!

**LEOPOLD IN THE CLASSROOM TODAY**

How are the ideas of Leopold used by educators today? We assert that the application of Leopold’s ideas, while common in natural resources and environmental curricula, represents a selective process rather than an embodiment of the whole. Educators tend to select those ideas that are compatible with accepted scientific paradigms or with their comfort levels. What have the uses of Leopold consisted of? For decades, wildlife professors have exposed students to the principles and management practices contained in *Game Management* (Leopold 1933) to provide historical context and to illustrate adaptation of practice in the face of new scientific information, e.g., the story of predator control. Today, a popular use of Leopold derives from his ecological views on land use: “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise” (Leopold 1989:224–225). This statement expresses the fundamental idea (termed “ecosystem management” in today’s lexicon) that management should strive to maintain the ecological integrity of forests, rangelands, and other ecosystems. That there is something in Leopold’s writings for everyone—and that people tend to pick and choose to suit their needs—was illustrated in the recent “battle of the professors” published in a special *Journal of Forestry* issue on Leopold and the Land Ethic. One of the parties in this debate (Callicott 1998) accused the other (Zeide 1998) of using a deceased and hence defenseless straw-man (Leopold) to attack the concepts and policies of ecosystem management. The initial debate spawned a flurry of letters and commentaries as academics and others jumped into the fray (see *J. For.*, Vol. 96, No. 4).

Of the many ideas that might be explored with students in ecology and natural resources, we suspect that Leopold’s ideas on humility, respect, and most of all love of the land are too much of a stretch in the comfort level of most professors. Love of the land is a most difficult element to incorporate into resource management plans and practices, and yet it accounts for much of the emotionally charged conflict that surrounds land-use planning and decisions. Although educators should not tell students what to believe or how to feel, they should encourage students to engage in deep, ethical reflection on relationships of people, land, and natural resources (Kessler 1995).
The design of our curriculum at the University of Northern British Columbia (UNBC) embodies several of Leopold's ideas on education. Beginning with their first-year courses, students in the Bachelor of Science program in natural resources management receive a thoroughly integrated perspective that includes the ecological, economic, and socio-cultural dimensions of natural resources. A fourth-year course in Environmental and Professional Ethics (NREM 411) is required of all students in the program, including majors in forestry, wildlife, fisheries, and resource recreation. This course, NREM 411, has acquired a reputation as the "killer course" in the Natural Resources Management curriculum because it requires students to demonstrate ways of learning and expressing themselves that are quite different from what they have proven adept at in their other courses. When asked to analyze the ethical implications of an issue, many students prefer instead to provide a factual account of the issue or to cite what other people (the "ethics specialists") have to say. They soon learn that this approach will not suffice in NREM 411, in which the objectives are for every student to reflect deeply on the ethical implications of issues pertaining to natural resources, to find and defend his or her personal position within the spectrum of ethical debate, and to develop a personal creed that will shape his or her conduct in professional life.

We often deal with students who are having difficulty in NREM 411. We find that even students who earn excellent grades in their science, management, and policy classes have a hard time in this course. If Leopold were here, he might attribute these difficulties to a mechanical, detached approach to education that inadequately encourages personal reflection and deep contemplation of the wider implications of human actions. We would have to agree with him.

LITERATURE CITED


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