

In 1928, Aldo Leopold left the U.S. Forest Service to take the lead in establishing a new profession of game management, modeled on the profession of forestry. He began by conducting game surveys and authoring a text for the new field. In 1933, he accepted a chair of game management with the University of Wisconsin where he began to train a generation of leaders in the wildlife field. Leopold continued to develop intellectually and in 1939, he transformed his course in 'game management' to 'wildlife ecology.' On the fiftieth anniversary of the publication of Leopold's Sand County Almanac we are pleased to offer this new view of Leopold's early teachings by Leopold biographer Curt Meine.

READING THE LANDSCAPE:

ALDO LEOPOLD AND WILDLIFE ECOLOGY 118

In the spring of 1939 Aldo Leopold offered a new course, Wildlife Ecology 118, at the University of Wisconsin in Madison. After joining the university faculty in 1933, Leopold developed an undergraduate course that he called "Survey of Game Management," which he taught each spring from 1934 to 1938. But rapid

changes in the field of ecology, the practice of wildlife management, and the philosophy of conservation prompted Leopold to overhaul and expand the earlier survey course. Revamped and retitled, it was apparently the first course offered in the United States—perhaps anywhere—under the designation "Wildlife Ecology." The shift in title was significant. It captured fundamental changes in Leopold's approach to the emerging field and in the conservation movement in general.

The class drew forty-five students, ten more than its predecessor had at its peak.¹ Among them was Lawrence Monthey, a twenty-year-old soil science student from Wisconsin. Monthey's class notes have been preserved by his family and are now available to researchers at the Forest History Society. These notes constitute the most complete extant record of Leopold's instruction at a critical juncture in the evolution of his ideas. Moreover, Monthey's notes provide a student's-eye view of a master professor at the very moment when an ecological approach to land

and wildlife management was first taking hold in academia and in the conservation professions. As such they provide a valuable benchmark against which to measure changes in the teaching and training of wildlife biologists, other conservation scientists and resource managers, and students in general.

LAYING THE GROUNDWORK

In the 1930s the midwestern land grant universities, the University of Wisconsin in particular, were laboratories for new approaches to agricultural and ecological science, land conservation, and extension services. The regional landscape was dotted with such innovators as Victor Shelford at the University of Illinois, Paul Errington at the University of Iowa, John E. Weaver at the University of Nebraska, and Paul B. Sears at the University of Oklahoma. At the University of Wisconsin, Leopold joined a faculty that included Richard T. Ely and George S. Wehrwein in agricultural economics, Norman Fassett

BY CURT MEINE

in botany, and Chancey Juday in limnology. Leopold's chair of Game Management in the university's Department of Agricultural Economics brought focus to an already rich capacity in conservation and the natural sciences.

More generally, trends in ecology and the conservation professions were setting the stage for Leopold's innovations. Community ecologists were bridging the long-standing gap between plant and animal ecology, a process symbolized by the publication in 1939 of Frederick Clements and Victor Shelford's *Bio-ecology*.² Shelford, through his work in the Ecological Society of America, had begun to stress the scientific significance of preserved natural areas. Even before the Dust Bowl storms began to blow (and in earnest afterwards), the voices of soil conservation—Sears, Hugh Hammond Bennett, Walter Lowdermilk—emphasized the connection between soil erosion and anthropogenic vegetation change. In the forests of the upper Great Lakes, Raphael Zon and other forest researchers were investigating the commercial and ecological viability of selection cutting systems.

In the late 1920s and early 1930s, Leopold made his own revolutionary contribution, one that would have implications for all the conservation fields. By connecting the dynamics of "wild life" populations to the dynamics of their habitats, Leopold triggered a tectonic shift in conservation's intellectual foundations. In his landmark 1933 text *Game Management*, Leopold effectively melded his extensive experience as forester and game manager with the emerging ideas of scientific ecology, especially as outlined by Charles Elton in *Animal Ecology* (1927). *Game Management* grew out of a series of lectures that Leopold offered in early 1929 at the University of Wisconsin before he formally joined the faculty. *Game Management*, in turn, provided the basic framework for "Survey of Game Management," which he first taught in the spring of 1934.

Over the next two years, the field of *game* management broadened into a more inclusive *wildlife* management movement.³ Changes in Leopold's teaching agenda reflected this expansion. In addition to the survey course, Leopold also offered a short course in game management for young farmers. He was disconcerted, however, by the degree to which even farm children had lost their familiarity with wildlife. "Most farms are devoid of wildlife," he noted, "and the farm boy is just as ignorant as if he came from town."⁴ This was something of a revelation to Leopold, and sensitized him to the need for a more general introduction to conservation issues and ideas.

As early as July 1935, Leopold expressed concern that his nascent academic program had "an important hiatus": it lacked "a general cultural course in conservation." Neither the short course nor the survey course was "particularly aimed at the student who may want to understand the conservation movement simply as one of the qualifications for effective citizenship."⁵ This sentiment may well have reflected the arrival of the Dust Bowl storms earlier that spring (an event that coincided with Leopold's first use of the term "land ethic").⁶ At the same time, Wisconsin was passing its landmark conservation education law, which mandated the teaching of conservation in all the state's public schools. "Wisconsin," Leopold wrote in September 1936, was thus "the first to see that the really basic problem lay in the education of the public, rather than in the training of professional managers."⁷

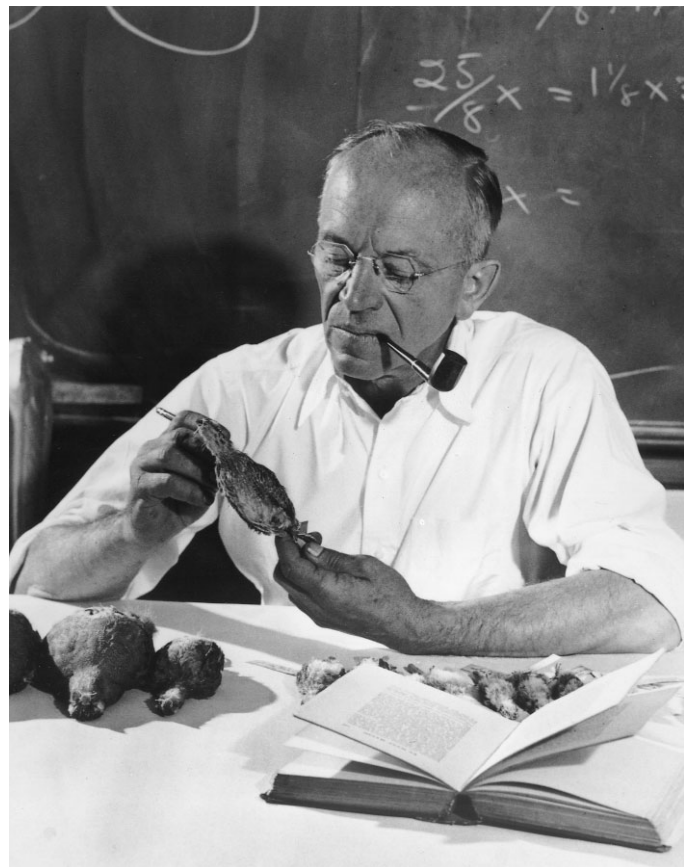


PHOTO BY ROBERT C. OETKING, COURTESY OF THE UNIVERSITY OF WISCONSIN ARCHIVES

During 1939 Aldo Leopold taught the first class in *Wildlife Ecology*. Leopold is shown here, in 1942, examining Hungarian partridge specimens.

This presented an immediate dilemma for Leopold. His time was limited, but the field needed both well-trained professionals and a better-informed public. He chose to focus his professional instruction on a select few graduate students while bringing the lessons of ecology and integrated land conservation to as broad a range of undergraduates as possible.⁸ In a university report outlining this latter need, Leopold noted that "the objective [of university instruction] should be to create a body of public opinion capable of *critical* support of conservation policies. The principal present defect in the conservation movement is that public enthusiasm has outstripped public discrimination."⁹

To meet this need Leopold hoped to develop, in partnership with other university experts, a unified course of study in conservation. The effort came to only partial fruition, but it did lead to the important appointment in 1937 of John T. Curtis to the university's botany department. Curtis, with Leopold, Fassett, and horticulturist William Longenecker, would provide much of the faculty leadership for the unprecedented ecological restoration and research efforts at the university's newly established arboretum.¹⁰

Just as conservation's pedagogical challenge was expanding, so was the professional niche of game management. When he first joined the university, Leopold saw game management as a discrete new field of conservation—an extension, in effect, of agronomy, up the food chain. Through improvements in the type and spatial distribution of cover vegetation, farmers

could produce a “crop” of wild game, to their economic, recreational, and aesthetic benefit. But his hopes for any achievement of this goal were soon tempered. By 1936 he would describe the new field to his university overseers as “increasingly intermeshed with the whole gamut of land uses, land problems, and land agencies.”¹¹ He further noted that in focusing on the economic benefits of “game cropping” he had underestimated landowner interest in other elements of the landscape—“wildflowers, songbirds, fish, fur, etc.”

In response to these various needs, Leopold began to rethink his own role as teacher. In a January 1938 memo he wrote, “The university in general gets very little from me. The brief technical course in Game Management is not what it most wants or needs. Ecology, geography, and policy would be more [to the] point, especially for prospective teachers and private citizens.”¹² A new course, “covering the whole wildlife field,” was needed.¹³ At first he thought to call the new course “Game Ecology and Geography.” Through the spring and summer of 1938 he further refined the idea, finally adopting the title “Wildlife Ecology.”

In October 1938 Leopold prepared a course announcement for prospective enrollees: “There is a growing demand for university courses in those aspects of ecology underlying conservation. To help meet this need there is offered a new course in wildlife ecology.” The course had not yet been formally approved by the university’s Faculty Committee on Courses but was soon thereafter. At the same time, Leopold changed his own title. Where he had always signed his correspondence “Professor of Game Management,” he now shifted to “Professor of Wildlife Management.”¹⁴

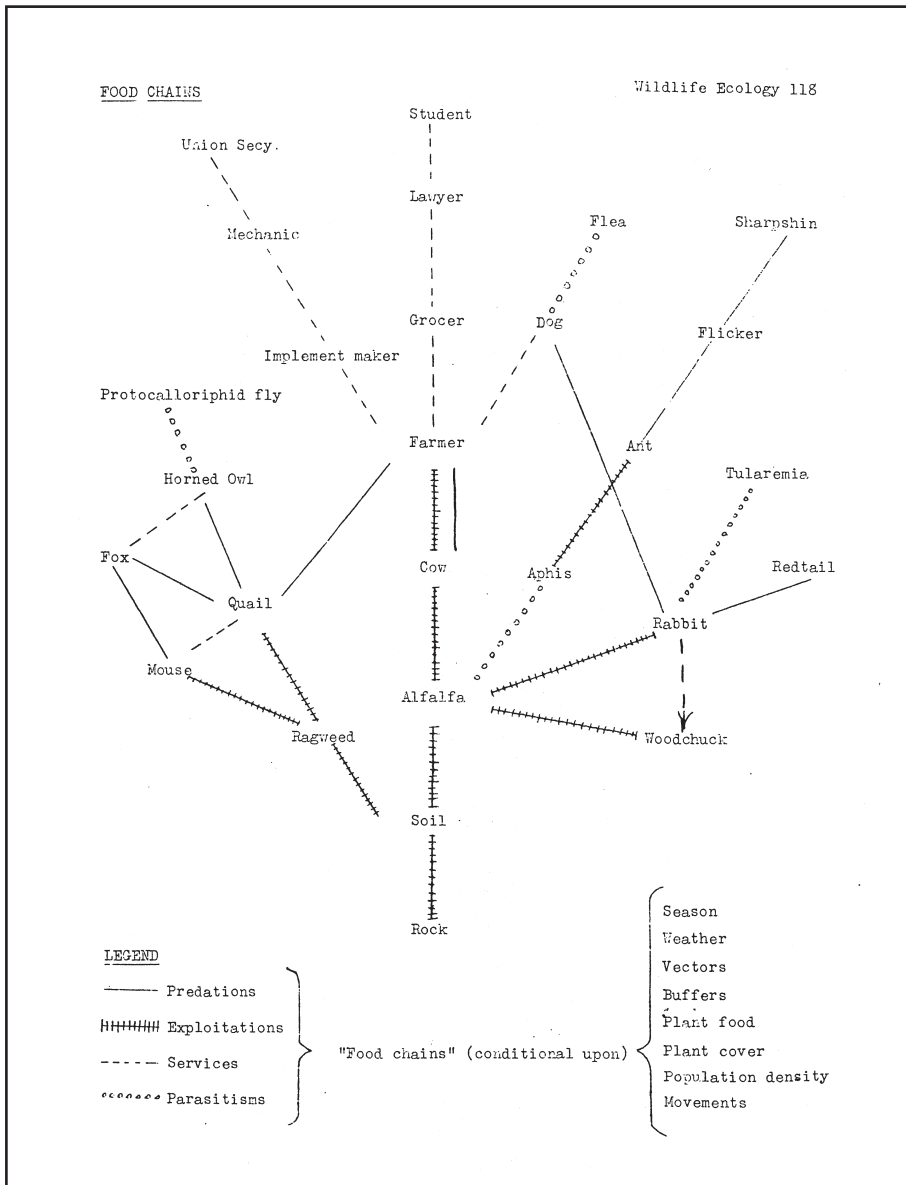
WILDLIFE ECOLOGY 118

Leopold defined a powerfully simple aim for the course: “to develop the ability to read landscape, i.e., to discern and interpret ecological forces in terms of land-use history and conservation.” This meant something very different from technical instruction in game management; the intent was to give students of wildlife management and allied fields a context in which to understand and build their technique. Leopold sought a diverse audience. He hoped to bring in students from four not necessarily overlapping groups. In his words:

1. Biologists who seek an antidote for over-specialization in laboratory work.
2. Naturalists who seek to extend their understanding beyond the identification of species.
3. Conservationists who wish to visualize the natural mechanisms which conservation seeks to control.
4. Students in any field who wish to understand how land-use determines plants and plants determine animals.

Leopold limited enrollment to higher-level undergraduates and beginning graduate students who were familiar with common birds, mammals, and wild and agricultural plants, but otherwise he established no formal prerequisites. Students were required to do “a considerable amount of library work,” as no single textbook—even Leopold’s *Game Management*—covered the course’s subject matter. Students were also required to attend Leopold’s twice-weekly lectures and to participate in a half-dozen Saturday field trips.

The focus of the student’s efforts was an “individual assignment in field work or reading.” After meeting with Leopold, the student was to select a project that would “integrate the subject matter of the course with the student’s major academic field... or his major personal interest.” This allowed Leopold to engage each student’s strengths. “Thus,” he advised, “the agronomist or botanist may be assigned a food-cover



Leopold’s version of the food chain shared with students in Wildlife Ecology 118.

survey; the landscaper a design problem in food and cover plantings; the entomologist or zoologist selected readings on animal food habits; the history student selected readings in conservation history; the biology teacher selected readings in conservation teaching materials.” From the beginning, Leopold sought through the course to establish “the role of wildlife in a liberal education” (as he would entitle a 1942 article).¹⁵

Wildlife Ecology 118 convened on February 21, 1939. The first section of the course, covering the first six weeks, addressed “the structure and properties of animal communities.” In these lectures, Leopold explained basic principles and concepts in community ecology, population biology, and autecology: food chains, biotic pyramids, trophic levels, breeding potential, limiting factors, population density and dynamics, carrying capacity, saturation, minimum populations, extinction and extirpation, population cycles, migration, other population movements, social organization, and animal behavior and physiology. This amounted to a distilled version of his prior survey course, now expanded to include a broader range of species and habitat types.

Importantly, Leopold did not launch immediately into explanation of these organizing concepts but introduced them subtly. In his first three lectures, Leopold presented a series of seven landscape case studies and three animal species “biographies.” Through the case studies, Leopold introduced his students to the art of reading landscape. They heard from one of the art’s premier practitioners. The cases—“History of Roadsides,” “History of a Prairie Coulee,” “History of the Ragweed Patch, Faville Grove,” “History of Central Wisconsin Marshes,” “History of Northern Wisconsin,” “Evolution of the Fencerow,” “History of a Tussock Marsh”—covered communities and landscape features that would have been familiar to most students. But Leopold’s adept use of dynamized natural history, which he saw as the hallmark of modern ecology, would have prompted them to look again. Using elegant diagrams and clear text, Leopold walked them through landscape histories:



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Leopold used a series of case studies to help students “learn to read the landscape”, whether it was a fence row, a Wisconsin marsh, or forest succession. Here, Leopold instructs student during the winter at the Arboretum.

- Twenty years of incremental road improvements had extinguished the remnant prairie flora, started a gully, and killed a nearby bur oak, while “the landscape engineer in charge of highway beautification plants an elm.”
- A century of haying, burning, ditching, and reflooding had radically altered the central Wisconsin marshes, and “the net effects of the ecological overturn are as yet by no means clear.”
- The sequence of fencing—from fenceless field, to log fence, to rail fence and hedge, to wire fence, to metal and concrete fence, to electric fence—changed the vegetative composition of field borders, altered the role of fire, affected animal movements, reconfigured predator-prey dynamics, and reduced floral and faunal diversity. (“Ultimately ...electric fences mean the complete subjugation of fencerow growths”).

Each case study concluded with a series of incisive questions. From the prairie coulee case study: “What is the meaning of the term “wheat gully”? When a watershed begins to display floods and gullies, is the deterioration of the soil far advanced or has it just begun? When pastured woods are closed to grazing, does the original undergrowth reappear, or do we get a new set of species? Why? Was the wooded area in 1870 greater or less than in 1840?”

Through the case studies, Leopold illustrated the “fundamental principle in all ecology”: the composition of the fauna depends on the presence of plants, and the presence of plants depends on the interaction of soils and human beings over time. The three species “biographies”—of pheasant, bobwhite quail, and great horned owl—stressed a similarly dynamic view of populations: a given population has a certain breeding potential, and over the course of a year faces a series of environmental contingencies that check its potential growth and determine its final level before the cycle begins again. From the beginning, Leopold included humans as “a part of the system, a part of the animal community.” (To illustrate this, Leopold’s food chain diagrams included such sequences as rock-soil-alfalfa-cow-farmer-grocer-lawyer-student.)¹⁶

Led thus gently to the understanding that landscapes and populations *change*, Leopold’s students could more easily comprehend the then unfamiliar building blocks of scientific ecology. They would have quickly realized, too, that their professor was after something more than rote memorization of ecological facts. Leopold had articulated this concern in a 1938 address at the University of Missouri. In that address, entitled “Natural History: the Forgotten Science,” Leopold criticized “the lopsidedness and sterility of biological education as a means of building citizens.” He asked his audience to “go afield with some typical bright student and ask him some questions. We can safely assume he knows how angiosperms and cats are put together, but let us test his comprehension of how the land is put together.”¹⁷ Leopold was after perception, judgment, and insight, while evoking enjoyment of the unfolding story of the land. “It was a course,” Joseph Hickey later recalled, “in thinking.”¹⁸

In the next series of lectures, Leopold covered territoriality, home range, edge effects, and plant succession, which together with the previously covered concepts would “lead to an understanding of most ecological pictures.” Leopold focused in one

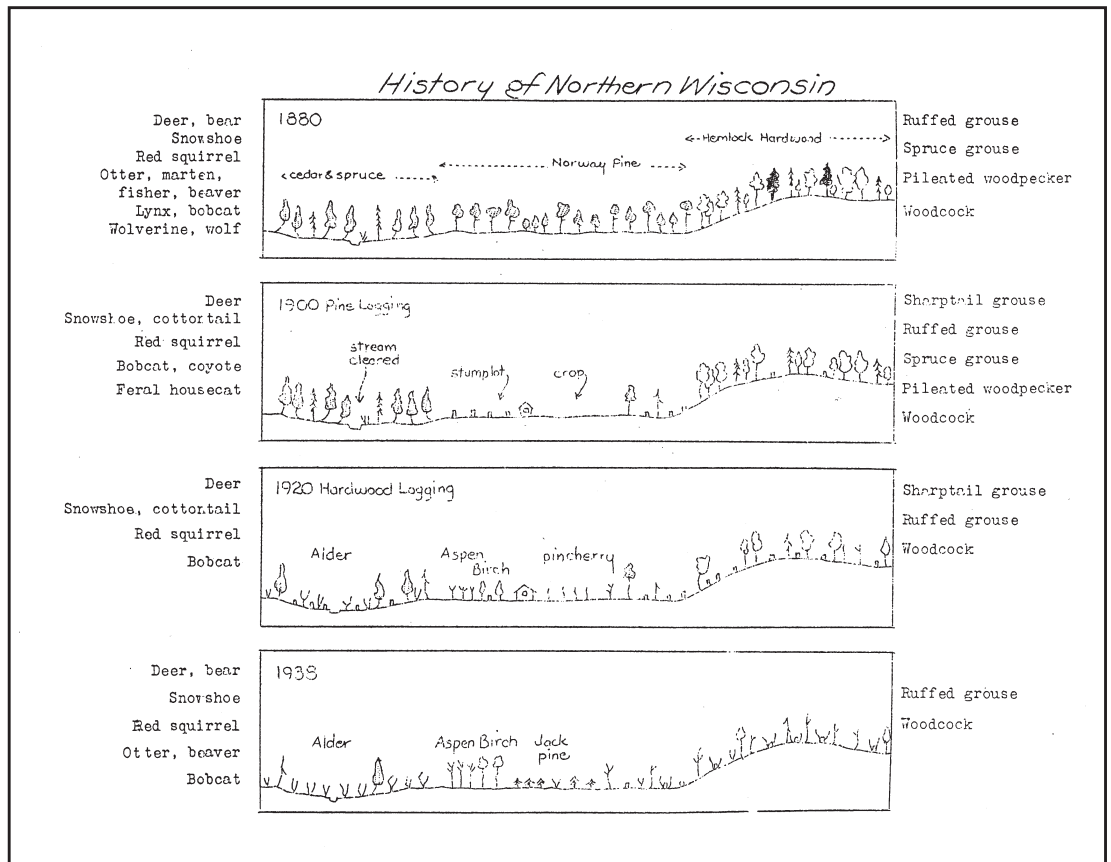
lecture on the types of local ecological evidence that can be helpful in interpreting field sites: the presence of particular relict plant species; plant growth forms and patterns of plant formations; stump fences and farmstead plantings; bear clawings, road scars, fire scars, and ice scars. Later in the course, Lawrence Monthey summarized “what you need to know for ecological deduction”:

1. Animals and their plant needs
2. Plants (at least by sight)
3. Soil origin (geology, phys[ical] geog[rrophy])
4. Soils and Agricultural practices (including silviculture, if any)
5. Administrative factors (plantings, poaching, laws if any)
6. Local History (including archeology)
7. Properties of diagnostic materials
8. Climatic history (hard winters, droughts, floods.)

That Monthey was absorbing Leopold’s lessons, and honing his own perception, is evident from his choice of a case study for a class exercise. “A very real case of plant successions came to me as I helped a resident of Lake Forest improve and manage a rather large lawn. The fact that the whole story occurred in the brief span of 4–5 years makes it all the more interesting—and leaves it well in mind.” Leopold always appreciated students who could find drama in even ordinary landscapes; he would certainly have appreciated Monthey’s account of the lawn’s “succession” (“opening the [oak] stand . . . spelled ‘finis’ to the mosses which need a moist, shady, acid location”).

Leopold turned next in his sequence of lectures to a basic review of field techniques in wildlife management: censusing; trapping; banding; and determination of food habits, sex, and age. Leopold supplemented all his lectures with extensive lists of supplementary readings, drawing upon his personal book and reprint library of some 3,000 titles. Literally and figuratively, Leopold provided access to the most current literature in the field. As the weather warmed through April and May, Leopold arranged field trips to several sites where his graduate students were carrying out research. In the field, students had the chance to try out their newly acquired skills in landscape perception.¹⁹

In the final weeks of class, Leopold departed somewhat from



Leopold’s diagram of land-use changes in northern Wisconsin shows the movement from forest to farm and back to forest.

his prepared outline, but followed his general intent to expand upon the course’s earlier themes and settings. Moving beyond the local and known landscapes of Wisconsin, he shared with his students his own field experiences from two very different regions: the intensively managed forests of Germany and the semi-arid wild mountains of the American Southwest and adjacent Mexico.²⁰ He devoted one lecture to the history of conservation, essentially building upon his opening chapter from *Game Management* by comparing the “wildlife chronologies” of Asia, Britain, the “Germanic Countries,” North America, and Wisconsin.

Leopold’s final lectures covered conservation philosophy, ethics, and economics. Unfortunately, Monthey’s notes from these sessions are rather scattered (end-of-spring-semester attention spans being then, surely, what they remain today). However, we can glean from them basic elements of Leopold’s emerging conservation worldview. Monthey noted: “Flow of energy” a better term than ‘Balance of Nature’ in describing the biota.” Thus did Leopold long ago dispense with the “balance of nature” image that is in disrepute among today’s ecologists and post-modern socio-environmental critics.²¹ Under the heading “Conservation Motives,” Monthey wrote: “Conservation of one resource at the expense of another.” Leopold was increasingly aware—and critical—of the tendency among conservationists to treat separate components of the land rather than land as an integrated whole. This would lead him, in the remaining decade of life, to call directly and explicitly for “a reversal of specialization; instead of learning more and more about less and less, we must learn more and more about the whole biotic landscape.”²²

Finally, Monthey's notes refer to "A new motivation for conservation arising from 1. Our inability to define 'value' 2. Our desire to mitigate the violence." Here Leopold appears to be referring directly to the text of his landmark essay "A Biotic View of Land," which he would deliver as an address just three weeks later, on June 21, 1939, at a joint meeting of the Society of American Foresters and the Ecological Society of America. "New principle in conservation," Monthey concludes: "let's preserve *all* of the elements of a landscape." This expression of "proto-conservation biology" tracks closely Leopold's clear statement in "A Biotic View of Land": "The only sure conclusion is that the biota as a whole is useful, and biota includes not only plants and animals, but soils and waters as well."²³

Leopold's students were in fact receiving the latest iteration of Leopold's evolving conservation philosophy, as expressed in the forthcoming "Biotic View of Land." Published later in 1939 in the *Journal of Forestry*, "A Biotic View" marked in many ways the fulfillment of Leopold's intellectual development over the previous decade. Readers find Leopold exploring the same themes that he developed in *Wildlife Ecology 118*: the need for

broader understanding of the structure and function of biotic communities; the dynamic rather than static view of nature; the "unprecedented violence, rapidity, and scope" of modern human impacts on the biota; a comparison of human impacts in different parts of the globe; and a call for all conservation fields to converge and agree upon a new ecological foundation for management decisions and techniques. In both the essay and the class, Leopold was putting his intellectual pieces together. His students, in fact, witnessed the formation of a new conservation paradigm.

WHITHER WILDLIFE ECOLOGY 118?

Lawrence Monthey performed well in *Wildlife Ecology 118*. His student paper on the "sky dance" of the woodcock earned an A (Leopold called it a "first-rate job" and asked for a copy to add to his woodcock file). Leopold's evident respect for his students comes through in other subtle ways. For one assignment, Monthey reviewed a 1938 article by Carl Sauer, "The Theme of Plant and Animal Destruction in Economic History."²⁴ With the cheekiness that is the special prerogative of undergraduates, Monthey took both Sauer and Leopold to task for their "attitude of wistful thinking for the 'good old days' when nature was in tune." "Personally," he continued, "I think that the young conservationists of today, the future leaders who must face the critical problem of the near future, must lose this sentiment and strive toward a new balance in lieu of what has happened." A knowing Leopold remarked in the margin: "Good."

The spring 1939 cohort of "young conservationists" experienced something of a golden moment in the development of ecological instruction. When the course reconvened, in the spring of 1940, the specter of world war already loomed. A year later the United States went to war, and student enrollments began to decline. Leopold continued to offer the course through the war years, but to diminished numbers. At the height of the war, only eight students signed up.

Enrollments began to recover in 1945, and Leopold was soon forced to teach the course with assistants. Over the next three years, the GI Bill swelled the campus with students. Leopold last taught the full course in 1947. By then, Leopold had streamlined the course somewhat. Much of the original substance of the course was retained, but the basic structure had evolved. Leopold continued to introduce the course with a basic overview of landscape composition and change, then moved into reviews of population ecology, Wisconsin-based wildlife ecology studies, community ecology, and ecological case studies from other regions. He seems actually to have downplayed the formal treatment of conservation philosophy, apparently choosing to weave it into the larger fabric of the class (even as he working on the final synthesis of "The Land Ethic.")²⁵

Upon Leopold's death in April 1948, his former student and newly hired colleague Joe Hickey took over the class. Hickey continued to offer the course to new generations of conservationists into the 1970s. The course is still taught at the University of Wisconsin by Dr. Stanley Temple, under the title *Wildlife Ecology 318: Principles of Wildlife Ecology*.

But Leopold's course is somewhat remarkable in the degree to which it has withstood the buffeting of postwar-era changes in



PHOTO BY ROBERT MCCABE, COURTESY OF THE UNIVERSITY OF WISCONSIN ARCHIVES

Leopold examining tamarack seedlings in 1947 approximately one year before his death. He was after perception, judgement and insight. His students would consider his course on wildlife ecology a course "in thinking."

academia and science. In many universities, whole organism biology—not to mention whole system ecology—has withered away in the deep shadows of well-funded microbiology, molecular genetics, and biotechnology programs. Ecology, forestry, and the other conservation sciences find themselves increasingly in the thrall of powerful statistical models, computer-generated analyses, and impressive geographic information systems. The type of “old-fashioned” natural history upon which Leopold and his generation based their instruction is itself becoming endangered.

For conservation, the decline of natural history is not merely a matter of nostalgic regret but of real consequences. In a recent discussion of this loss, conservation biologist Reed Noss writes, “already the limiting factor in many cases is unavailabil-

ity of basic data on the life histories of species, interactions among species, and ecological processes. How can we expect [data] to be analyzed and interpreted with insight and wisdom by people who have never seen the species in question and scarcely ever take their eyes off the computer screen.”²⁶ Noss notes that even the field trip, “the core experience of any good organismic biology or ecology course,” is becoming endangered due to the cost of travel, liability concerns, and competing demands on student time.

Yet, low rumblings of a counter-response can also be heard. As traditional disciplines reinvent themselves, and new “inter-disciplines” such as conservation biology and restoration ecology carve out necessary academic niches, students are

MEASURING UP: LAWRENCE MONTHHEY AND THE LAND ETHIC

BY ROGER MONTHHEY AND KARIE KIRKPATRICK

In the dusty attic of his old farmhouse, Roger Monthey discovered his father’s class notes from Aldo Leopold’s first wildlife ecology course offered at the University of Wisconsin in 1939. Monthey, currently the Forest Stewardship Program Representative for the USDA Forest Service in Durham, New Hampshire, graciously made these notes available to researchers at the Forest History Society.

Roger’s father, Lawrence (L. G.) Monthey, was tragically killed in an auto accident in 1985. Following his days at the University of Wisconsin, Monthey entered the U.S. Army during World War II, and after the war he returned to Wisconsin, where he purchased 115 acres of woodland and farmland near Madison in 1953. He worked for twelve years as an editor with the American Society of Agronomy and later with the University of Wisconsin Cooperative Extension in Madison. In the later years of his life, he was a wild foods expert for the Environmental Resources Unit at UW-Madison and conducted wild plant and mushroom seminars throughout the state of Wisconsin for which he received wide recognition.

It is difficult to gauge how much influence Leopold’s wildlife ecology class had on Monthey’s subsequent stewardship activities. Lawrence Monthey, a soil science student at the university, had a “Johnny Appleseed” trait about him all his life, planting trees wherever he went. After purchasing his farm, he received each spring free trees from the local Isaak Walton League and planted them in shelterbelts to protect the house from fierce winter winds. He also applied for and received federal assistance from the former Soil Conservation Service and Agriculture Stabilization and Conservation Service (currently the Natural Resources Conservation Service and Farm Services Administration) to install ditches to reduce surface erosion from farm fields and to let some of the fields go fallow under the old Soil Bank Program. He worked out agreements with the farmers who leased his farm fields to leave sodded waterways, to retain vegetated fence rows, and eventually to apply low tillage planting methods.

With regard to woodlot management and wildlife, Monthey’s biggest achievement was to allow the natural regeneration of about twenty acres of



Lawrence G. Monthey not only left us his class notes from Aldo Leopold’s first class on Wildlife Ecology, he left a lasting legacy in those he helped to understand and enjoy wild plants in our environment.

trees, which at the time of the farm’s purchase was blue grass pasture with only a few bur oak trees. Today, this area is a beautiful stand of red, white, and bur oaks, shagbark hickory, and a few planted black walnut and white ash that provide habitat for white-tailed deer, wild turkey, cottontail rabbits, and gray squirrels. Monthey showed that time can heal the land, and that forests and associated wildlife communities can be restored that once were just distant memories. Aldo Leopold probably would have considered Monthey’s participation in these activities as measuring up to his view of a land ethic.

being asked to reengage with their local landscapes. For these students enrolled in courses bearing diverse labels in varied departments, the primary objective of Leopold's original wildlife ecology course remains unshakably relevant. To understand the world they live and work in, students must "develop the ability to read landscape... to discern and interpret ecological forces in terms of land-use history and conservation."

This was the goal of Aldo Leopold's teaching. To perceive one's place with critical insight, to peer into the drama of the land's workings, to understand one's fellow creatures on their own terms in their own worlds—these were the foundations upon which not only training in conservation but also satisfaction in life were to be built. In one of his last Wildlife Ecology 118 lectures, Leopold let his students know what to expect from him, and from the land: "I am trying to teach you that this alphabet of 'natural objects' (soils and rivers, birds and beasts) spells out a story, which he who runs may read—if he knows how. Once you learn to read the land, I have no fear of what you will do to it, or with it. And I know many pleasant things it will do to you."²⁷ n

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NOTES

1. Aldo Leopold, "Chair of Wildlife Management, University of Wisconsin," 16 March 1939. Series 9/25/3, Box 1, Department of Wildlife Ecology Papers, University of Wisconsin Archives.
2. Frederick E. Clements and Victor E. Shelford, *Bio-ecology* (New York: John Wiley and Sons, 1939).
3. See Curt Meine, *Aldo Leopold: His Life and Work* (Madison: University of Wisconsin Press, 1988), 340–66.
4. Aldo Leopold, "Report of Chair of Game Management to Wisconsin Alumni Research Foundation," 15 June 1937, Series 9/25/3, Box 1, Department of Wildlife Ecology Papers, University of Wisconsin Archives.
5. Aldo Leopold, "Memorandum for Dean Christensen," 29 July 1935. Series 9/25/3, Box 1, Department of Wildlife Ecology Papers, University of Wisconsin Archives.
6. See Aldo Leopold, "Land Pathology," in *The River of the Mother of God and Other Essays by Aldo Leopold*, ed. Susan L. Flader and J. Baird Callicott (Madison: University of Wisconsin Press, 1991), 212–17.
7. Aldo Leopold, "Report to the Wisconsin Alumni Research Foundation on the Chair of Game Management, 1934–36, 25 September 1936, Series 9/25/3, Box 1, Department of Wildlife Ecology Papers, University of Wisconsin Archives.
8. Leopold, "Chair of Wildlife Management."
9. Aldo Leopold (Chair, Committee on Wildlife Conservation), *The University and Conservation of Wisconsin Wildlife*, Bulletin of the University of Wisconsin, Science Inquiry Publication no. 3, February 1937.
10. Curt Meine, "Reimagining the Prairie: Aldo Leopold and the Origins of Prairie Restoration," in *Recovering the Prairie*, ed. Robert Sayre (Madison: University of Wisconsin Press, in press).
11. Leopold, "Report to the Wisconsin Alumni Research Foundation."
12. Aldo Leopold, "Memo on Chair of Game Management," 28 January 1938, Series 9/25/3, Box 1, Department of Wildlife Ecology Papers, University of Wisconsin Archives.
13. Leopold, "Chair of Wildlife Management."
14. Meine, *Aldo Leopold: His Life and Work*, 387.
15. Aldo Leopold, "The Role of Wildlife in a Liberal Education," in *The River of the Mother of God*, ed. Flader and Callicott, 301–5.
16. See Aldo Leopold, "The Role of Wildlife in a Liberal Education."
17. Aldo Leopold, "Natural History: The Forgotten Science," manuscript, 26 April 1938, Series 9/25/10–6, Box 16, Aldo Leopold Papers, University of Wisconsin Archives.
18. Joseph J. Hickey, in *Aldo Leopold: Mentor*, ed. Richard E. McCabe (Madison: Department of Wildlife Ecology, University of Wisconsin), 49.
19. Invariably, the greater the number of students in Leopold's class, the more difficult teaching in the field became. Joe Hickey recalled that, during the years he worked with Leopold, field trips "were somewhat marred by the high ratio of students per prof. [Leopold] was a thrilling teacher to accompany in the field when the party was rather small (say only four)." Hickey, in *Aldo Leopold*, 49.
20. Leopold's reading of these landscapes can be found in a variety of accounts. For Germany, see Leopold, "Deer and Dauerwald in Germany: I. History," *Journal of Forestry* 34:4 (April 1936), 366–375; and "Deer and Dauerwald in Germany: II. Ecology and Policy," *Journal of Forestry* 34: no. 5 (May 1936): 460–66. For Mexico, see Leopold, "Conservationist in Mexico," *American Forests* 43: no. 3 (March 1937): 118–20.
21. Leopold's explicit avoidance of the term and concept of "the balance of nature" dates to the mid-1920s. For his later discussion, see Leopold, "A Biotic View of Land," *Journal of Forestry* 37: no. 9 (September 1939): 727–30.
22. Aldo Leopold, in *Round River: From the Journals of Aldo Leopold*, ed. Luna B. Leopold (New York: Oxford University Press, 1953), 159. See also Aldo Leopold, "Conservation: In Whole or In Part," in *The River of the Mother of God*, ed. Flader and Callicott, 310–19.
23. Leopold, "A Biotic View of Land."
24. Sauer's essay was published in the November 1938 issue of the *Journal of Farm Economics*.
25. See Hickey in *Aldo Leopold*, 47; "Wherefore Wildlife Ecology?" in *The River of the Mother of God*, ed. Flader and Callicott, 336–37; Meine, *Aldo Leopold*, 500–505.
26. Reed Noss, "Does Conservation Biology Need Natural History?" *Wild Earth* 8: no. 3 (Fall 1998):10–14.
27. Leopold, "Wherefore Wildlife Ecology?"