

PETER S. ALAGONA

## FORUM: introduction: fifty years of wildlife in America

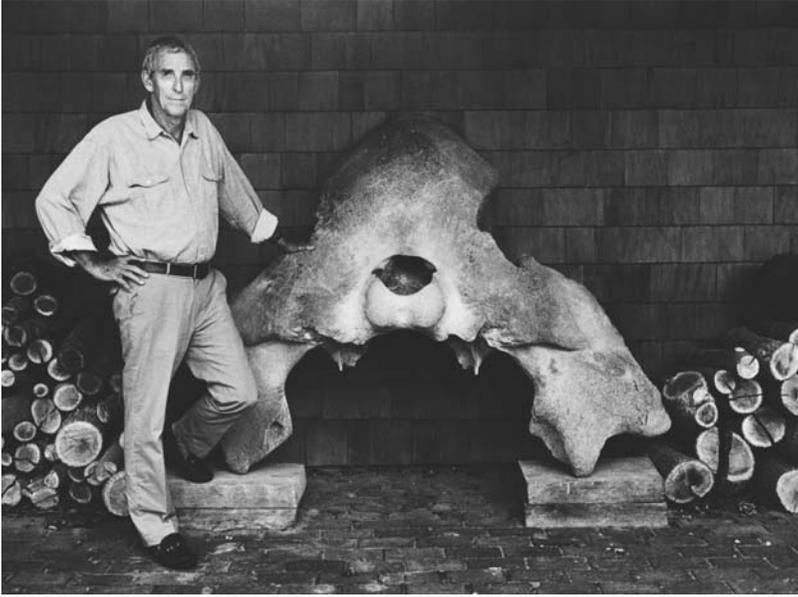
### ABSTRACT

Historians who have written about wildlife in North America have told their stories in many ways: as tales of ecological decline, tragedies of the commons, chronicles of scientific discovery, parables of ethical redemption, clashes of values, reorganizations of spatial relationships, expansions of federal authority, and struggles of conservation versus social justice. This essay introduces the “Fifty Years of Wildlife in America” forum. The forum includes ten short articles that consider the legacy of Peter Matthiessen’s classic 1959 book, *Wildlife in America*, explore how wildlife scholarship has changed in the half century since, and chart new directions for historical research on the interactions between people and wild animals on the continent.

In 1959 Peter Matthiessen published one of the most widely read books in the history of American environmental literature. By the time his book, *Wildlife in America*, appeared in print, humans and wild animals had lived together on the

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**Figure 1.** Peter Matthiessen with fossil, Sagaponack, New York, 1995. Credit: Christopher Felver, CORBIS.

continent for more than 14,000 years.<sup>1</sup> About two hundred native species had gone extinct, and hundreds of exotic species had colonized the landscape. Wild animals had served as food, clothing, shelter, servants, companions, weapons, and totems; a few charismatic species had even attained the status of national icons. Matthiessen chronicled wildlife losses and celebrated conservation efforts by scientists and government officials. His book sold tens of thousands of copies, helped launch his career as one of the world's best known environmental authors, generated support for a renewed conservation movement, and promoted scholarly research into the history of wildlife in America.<sup>2</sup>

Peter Matthiessen was not the first author to reflect on this subject. As early as the eighteenth century, naturalists began to write about human interactions with fish and game in North America.<sup>3</sup> During the late nineteenth century, J. A. Allen and George Bird Grinnell produced studies on the spectacular declines of game species, such as the plains bison and passenger pigeon. In the early twentieth century, writing about wild animals spawned a literary industry, with books by William T. Hornaday, Earnest Thomas Seton, and many others. The growth of the discipline of ecology and the emergence of the profession of wildlife management during the New Deal era resulted in numerous popular and scientific publications, by authors such as Aldo Leopold, which chronicled the loss and conservation of fish and game. So why focus on Matthiessen?

*Wildlife in America* was arguably the first wildlife history of the environmental era. Published three years before Rachel Carson's *Silent Spring*, the book appeared at a pivotal moment in the history of American environmentalism, and it anticipated many of the changes that would occur in wildlife conservation over the succeeding decades. During the first half of the twentieth century, naturalists worked to broaden the scope of conservation beyond a few valuable fish and game species and to create wildlife refuges that would provide habitat for game and nongame species. After the Second World War, wildlife managers continued to work for better hunting and fishing conditions that would satisfy the sportsmen who served as their most important constituency. Yet the specialization, professionalization, and bureaucratization of the field also transformed it in ways that made scientists and managers less apt to engage in political campaigns or fight for the protection of nongame species. Matthiessen's book helped redraw attention to the plight of often overlooked nongame species, particularly those in danger of extinction due to predator elimination programs and habitat loss. Within a decade, these concerns would begin to transform wildlife politics, and they would eventually lead to the passage of key state and federal laws, including the Endangered Species Act of 1973.

Matthiessen's work was also important for helping to develop a particular literary form that came to typify much of American environmental writing during the final decades of the twentieth century. Matthiessen wrote eloquently, and that alone attracted many readers. But even more important was the model he offered of an independent naturalist speaking on behalf of scientists. Matthiessen believed scientists had the tools to solve environmental problems, but they had become so specialized that they no longer had the incentive or ability to describe their work to a broader audience. Matthiessen's style and approach has been imitated dozens of times in the last fifty years, by professional scientists and amateur naturalists alike, with a profound influence on environmental writing and reporting.<sup>4</sup>

*Wildlife in America* foreshadowed the political and literary changes of the 1960s and 1970s, but its historical narrative is based in arguments that developed half a century earlier. The book is unabashedly declensionist. It portrays a continent where, before European contact, wild animals and indigenous peoples lived in a state of natural abundance. The destruction that followed was partly due to the cultural dispositions of the colonizers, and sometimes it was just the result of ignorance or indifference. But Matthiessen believed that economics was the major force of change. Tales of unfettered economic exploitation dominate the book, from its opening paragraphs on the "outlying rocks" of the North Atlantic, to the "fur counties" of the north woods, to the Far West and the "end of the wilderness road." If unregulated exploitation was the problem, then the solution was a stricter set of laws administered by government agencies and grounded in ecological science. Although his book critiques the failures of wildlife management, Matthiessen maintained his faith in the ability of experts to

learn from past mistakes, and he deferred to practitioners who were working for change.

Matthiessen's work coincided with the publication of the first postwar environmental histories. Yet it was not until the 1980s and 1990s that scholars such as Thomas Dunlap, Arthur McEvoy, Andrew Isenberg, Lisa Mighetto, Gregg Mitman, Jennifer Price, and James Tober began to focus on the histories of fish and wildlife in North America.<sup>5</sup> The result was a great outpouring of scholarship that reinforced some of Matthiessen's arguments but challenged many others. The story of wildlife decline remained a popular theme in the historical literature, but its causes, consequences, and meanings started to seem much more complex. The economic narrative remained present, but it faded into the background as scholars began to explore the politics of science, the consequences of police power, the influence of popular culture, and the roles that wild animals played in larger debates about race, class, gender, and citizenship.

Historians who have written about wildlife in America during the past few decades have told their stories in many ways: as tales of ecological decline, tragedies of the commons, chronicles of scientific discovery, parables of ethical redemption, clashes of values, reorganizations of spatial relationships, expansions of federal authority, and struggles of conservation versus social justice. Wild animals have served as vessels and mirrors, containing and reflecting human frustrations, ambitions, and contested social relations. They have become the subjects of fierce political debates, and they have even participated in those debates as voiceless agents of change. Books by Carl Jacoby, Peter Coates, Shannon Petersen, and Stephen Bocking attest to the diversity of work that has emerged in recent years at the boundaries of environmental history, social history, intellectual history, legal history, and the history of science and technology.<sup>6</sup> After three generations of research, the story of wildlife in America continues to hold fascination in part because it tells us so much about ourselves.<sup>7</sup>

The essays that follow are the product of a forum that coalesced in 2009, fifty years after the publication of Matthiessen's book, among a group of junior and midcareer scholars interested in pushing the conceptual and methodological boundaries of their work on wildlife in North America. The goal of the forum was to reflect on the legacy of Matthiessen's work while exploring new areas of research and highlighting questions for future investigation. In early 2010, the authors circulated drafts of their essays and then participated in a ten-day digital symposium that provided an opportunity for feedback, reflection, and discussion. During that time, each of the authors contributed to a lively debate about the history and historiography of wildlife in America. That conversation has continued to this day.

The first essay, by John Sandlos and Yolanda Wiersma, takes an interdisciplinary look at one of the most fundamental issues in North American wildlife history: How abundant and widely distributed were native species before European impacts? The authors find that many traditional assumptions

about the abundance of precolonial wildlife are based on weak and conflicting data. They call for a more rigorous approach to historical methodology and a more nuanced understanding of past wildlife populations. Their essay provides a superb example of kind of the interdisciplinary work now underway at the boundaries of environmental history and conservation biology.

The second and third essays in this collection, by Jon Coleman and Louis Warren, explore the roles of wild animals in the making of social and cultural identities. In Coleman's story, David Crockett emerges as a man who learned to capitalize on his poor, rural, and generally marginalized status by transgressing the boundaries between tame and wild, east and west, black and white, human and animal. He infused his favorite quarry, the black bear, with meaning as a symbol of race relations, masculinity, and regional identity, which he used to build his reputation, lift himself from poverty, and further his political career. Crockett exploited the fluid frontier and its inhabitants for personal gain in a vigorous new country. For others, however, the closing of the frontier was a denouement—a time of social collapse when it became necessary to appeal to higher powers. In Warren's essay, we learn about how the Ghost Dance, a millennial movement that spread among the Indian groups of the American West in 1890, attempted to mobilize the spirits of wild creatures to invoke earthly renewal. "Wild animals," Warren reminds us, "have been central to religious and secular predictions about the fate of humanity perhaps since there were humans at all."

The next two essays, by Etienne Benson and Lissa Wadewitz, explore the vocabularies of conservation. They argue that the definitions of basic terms, such as *fish* and *wildlife*, matter in environmental history. The word *wildlife*, in its current compound form, did not come into common usage until the 1920s. As Benson shows, the popular adoption of the word *wildlife*, as opposed to "wild-life" or "wild life," helped reinforce the culture/nature, human/animal divide at a time when conservationists were developing a more scientific, managerial approach to wild animals. For Wadewitz, the key question is which species count as fish or wildlife. This distinction is important, in part, because animals in these two categories have received such different treatment in economics and the law. These etymological investigations remind us of the relationships between language and practice, and the ways that key terms both create and obscure social and ecological boundaries with real consequences for people and nature.

The next three essays—by Mark Barrow, me and Robert Wilson—explore the conservation of species and the spaces where they live. Mark Barrow's essay expands his earlier work on endangered species, *Nature's Ghosts: Confronting Extinction from the Age of Jefferson to the Age of Ecology* (Chicago, 2009). He argues that naturalists, not hunters or humanitarians, have been the driving forces behind species conservation, and he wonders whether the single-species approach typical of the Endangered Species Act has outlived its usefulness. My essay historicizes the concept of habitat. It

suggests that all debates about wildlife conservation are really debates about access to and control of lands and natural resources, or habitat broadly conceived. No agency has played a more central role in species and habitat conservation than the U.S. Fish and Wildlife Service (FWS). Yet, as Robert Wilson points out, the FWS has received far less attention from environmental historians than some other agencies. This calls for a new research agenda in the administrative, regulatory, and institutional history of this key federal bureaucracy.

The final two essays, by Dawn Biehler and Jennifer Martin, move from institutional and intellectual history to more visceral experiences. Biehler's essay highlights the connections between wildlife history, urban history, and public health history, and it calls for a consideration of wild animals as more than just subjects of exploitation or conservation. In Biehler's story, wild animals are also disease vectors, health risks, and indicators of social inequality. If you are looking for corruption, follow the money, but if you are looking for poverty and preventable disease, follow the rats. Martin's essay jumps to the other side of the food web. It uses shark attacks and shark research to explore the issue of nonhuman agency—a central concern for scholars of animal studies—and calls for more attention to the historicity, diversity, and agency of individual animals in environmental history.

Together, these ten essays canvass the subfield of wildlife history, illustrate its current directions, and challenge scholars to push its theoretical and methodological boundaries.

*Peter S. Alagona is an assistant professor in the Department of History and Environmental Studies Program at the University of California-Santa Barbara.*

## NOTES

1. Peter Matthiessen, *Wildlife in America* (New York: Viking Press, 1959).
2. Matthiessen's work has been the subject of numerous scholarly articles, including two published in the *Environmental Review*, the predecessor journal to *Environmental History*. See John R. Cooley, "Waves of Change: Peter Matthiessen's Caribbean," *Environmental Review* 11:3 (Autumn 1987): 223-30; SueEllen Campbell, "Science and Mysticism in the Himalayas: The Philosophical Journey of Peter Matthiessen and George Schaller," *Environmental Review* 12:2 (Summer 1988): 127-42.
3. Mark Barrow, *Nature's Ghosts: Confronting Extinction from the Age of Jefferson to the Age of Ecology* (Chicago: University of Chicago Press, 2009).
4. For an example of an attempt to imitate and update *Wildlife in America*, see David S. Wilcove, *The Condor's Shadow: The Loss and Recovery of Wildlife in America* (New York: Anchor Books, 1999).
5. *Wildlife in America* appeared the same year as one of the foundational texts in the field of environmental history: Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge: Harvard University Press, 1959). Key works by the listed authors include Thomas

- Dunlap, *Saving America's Wildlife: Ecology and the American Mind, 1850-1990* (Princeton: Princeton University Press, 1991); Arthur McEvoy, *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850-1980* (Cambridge: Cambridge University Press, 1990); Andrew Isenberg, *The Destruction of the Bison: An Environmental History, 1750-1920* (Cambridge: Cambridge University Press, 2001); Lisa Mighetto, *Wild Animals and American Environmental Ethics* (Tucson: University of Arizona Press, 1991); Gregg Mitman, *Reel Nature: America's Romance with Wildlife on Film* (Cambridge: Harvard University Press, 1999); Jennifer Price, *Flight Maps: Adventures with Nature in Modern America* (New York: Basic Books, 2000); James Tober, *Who Owns the Wildlife?: The Political Economy of Conservation in Nineteenth Century America* (Westport: Greenwood Press, 1981).
6. Karl Jacoby, *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001); Peter A. Coates, *American Perceptions of Immigrant and Invasive Species: Strangers on the Land* (Berkeley: University of California Press, 2006); Shannon Petersen, *Acting for Endangered Species: The Statutory Ark* (Lawrence: University Press of Kansas, 2007); Stephen Bocking, *Biodiversity in Canada: Ecology, Ideas, and Action* (Toronto: University of Toronto Press, 2000).
  7. The participants in this forum have been among the most active participants in research on the history of wildlife in America in recent years. For some key works not previously cited in this introduction, see Mark Barrow, *A Passion for Birds: Ornithology after Audubon* (Princeton: Princeton University Press, 1998); John Sandlos, *Hunters at the Margin: Native People and Wildlife Conservation in the Northwest Territories* (Vancouver: University of British Columbia Press, 2007); Jon Coleman, *Vicious: Wolves and Men in America* (New Haven: Yale University Press, 2006); Louis Warren, *The Hunter's Game: Poachers and Conservationists in Twentieth-Century America* (New Haven: Yale University Press, 1999); Etienne Benson, *Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife* (Baltimore: Johns Hopkins University Press, 2010); Robert M. Wilson, *Seeking Refuge: Birds and Landscapes of the Pacific Flyway* (Seattle: University of Washington Press, 2010).

PETER S. ALAGONA

# FORUM

## what is habitat?

### ABSTRACT

This essay offers an introduction to the much longer story of the emergence and development of habitat as a key concept in environmental science, law, and politics. Since the nineteenth century, naturalists have recognized that habitat could be a limiting factor for wildlife populations. As early as the 1920s, ecologists adopted the concept of habitat as an organizational framework for their field. The advent of wildlife management, in the 1930s, furthered interest in habitat conservation on the public lands. After World War II, administrative agencies and conservation organizations adopted divergent approaches to habitat management, some of which came into conflict. The passage of the federal Endangered Species Act, in 1973, launched a new phase in which land use controversies would increasingly focus on protected species' habitat. Today, environmental groups often present habitat conservation, in the form of land purchases or easements, as the cure-all solution for a wide variety of problems. Habitat protection is a cornerstone of conservation, but it is not a panacea.

What is habitat? This seemingly simple question has many different answers. In its most basic form, habitat is where a species lives. Where a species lives is determined by the resources present, its ability to capture those resources,

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its capacity to exploit new resources as they become available, and a lack of any intervening factors that may preclude it from using the resources present. In the scientific literature, habitat has several related definitions. Habitat may refer to a geographic space or a conceptual space. It may refer to the area a species occupies or to a set of biophysical conditions necessary for the species' survival. And it may refer to a species' historic range, potential range, or current range. Scientists still know relatively little about the habitat use of most species. Yet the idea of habitat is essential for understanding evolution and conserving the diversity of life, and it is one of the most fundamental concepts in all of the biological and environmental sciences.

Habitat poses equally complex issues for historians. This will come as no surprise to readers familiar with the historical literature on other key environmental concepts, such as *nature* and *wilderness*. Historians have not subjected habitat to such critical examination. Yet we live in an era in which habitat is everywhere. It is difficult to think of any earthbound landscape that does not now qualify as habitat for some imperiled species. In 1959 when Peter Matthiessen wrote his classic book, *Wildlife in America*, he described the history of habitat in North America as a tale mainly of loss and destruction. In the years since, habitat protection has emerged as a nearly universal justification for conservation programs around the world. Calls for habitat protection have catalyzed, bolstered, and even superseded some more traditional arguments for conservation. This includes wilderness, a concept from which habitat draws some, but not all, of its resonance. The emergence of habitat as a key concept in environmental science and law is one of the great untold stories in American conservation history.<sup>1</sup>

The word *habitat* came into common use during the eighteenth century. Naturalists adopted it from the Latin form *habitare*, which referred to a "natural place of growth or occurrence of a species." The word gained popularity in nineteenth-century European biogeography and in the dynamic ecology practiced by Frederic Clements and others during the early twentieth century. Its earliest uses may have referred to plants, but authors soon invoked habitat to describe a more general dwelling place that also included wild animals. By the 1910s, ecologists such as Victor Shelford, the first president of the Ecological Society of America, had begun to use habitat as an organizing principle for their new discipline. According to Shelford, one of ecology's "outstanding and original features...is the study and orderly interpretation of the habitats of organisms." Such habitats, he concluded, "can be organized into science."<sup>2</sup>

The idea that ecologists should focus on "natural" habitats was peculiar to the United States and a handful other countries with colonial histories outside Europe. It differed from most European ecology, which considered traditional human activities as essential aspects of the indigenous cultural landscape. Yet the emphasis on natural areas was as much a reaction to contemporary political and economic factors as it was a continuation of age-old cultural

ideas about the human place in nature. In the 1910s and 1920s, ecologists in the United States were searching for a mission and clientele that would demonstrate their discipline's social relevance and promote its growth and development. Foresters, range managers, and other natural resource professionals had already specialized on particular economic sectors and working landscapes. Ecologists needed to find alternative spaces where they could become the resident experts and pursue their research and teaching. "A branch of biological science which obtains its inspiration in the natural order in original habitats," Shelford wrote, "must depend upon the preservation of natural areas for the solution of many problems."<sup>3</sup>

Until 1932, few such preserves were available outside a small collection of national parks. During the Great Depression, however, the U.S. government acquired vast new tracts of land for conservation as part of a much larger effort to reduce agricultural surpluses and stimulate the economy. Almost 50 percent of the lands ever acquired by the federal government, including 4.7 million acres of new wildlife refuges, were obtained in this way between 1929 and 1945. Visions for these new public lands ranged from wilderness areas to national parks to wildlife refuges for hunting and fishing. Each of these visions represented an argument about the highest use of fish and game, and how to best restore the nation's depleted wildlife through habitat management.<sup>4</sup>

Figures such as Ira Gabrielson, "Ding" Darling, and Aldo Leopold became the most famous of these Depression-era conservation visionaries. But other important figures, such as Paul Errington in the Midwest and Herbert Stoddard in the Southeast, also pursued important research programs that explored wildlife-habitat relationships and contributed to land management. One particularly innovative approach came from the Museum of Vertebrate Zoology, at the University of California-Berkeley. By 1932 Joseph Grinnell and his students there had developed the first program for habitat management in the national parks. Their work anticipated and articulated almost all of the key ideas that would inspire the new field of conservation biology some four decades later.<sup>5</sup>

After World War II, the U.S. Fish and Wildlife Service took a different direction when it embarked on a program of intensive habitat management in its wildlife refuges. It erected dams, rerouted waterways, and cultivated crops, all to produce abundant waterfowl. It also deployed army surplus equipment left-over from the war, including helicopters, floodlights, and grenades, to contain the animals in refuges that were still often surrounded by farms. Habitat conservation efforts expanded with the growth of non-governmental land management organizations, including The Nature Conservancy. Such groups have increasingly focused on land acquisition and administration, often in partnership with state and federal agencies, as tools to protect habitat for biological diversity. Since the 1970s, many debates about habitat conservation have focused on a small subset of all biological diversity: federally listed endangered species.<sup>6</sup>

The Endangered Species Act (ESA) passed Congress in 1973 by a unanimous voice vote of 92-0 in the Senate and 355-4 in the House. This consensus reflected the act's broad public support (see Mark Barrow's essay in this forum). Since then, scholars have argued that some politicians voted for the ESA because they did not anticipate how many species, many of them obscure, would become endangered and require federal action. Yet by 1973 the U.S. Fish and Wildlife Service had already listed 108 species, including such little known varieties as the unarmored threespine stickleback and the Pahranaagat roundtail chub. An alternative explanation is that many politicians failed to comprehend the implications of the ESA's definition of "take," which precluded not only hunting and fishing but also a variety of other activities that could harm a listed species. In 1995, after nearly two decades of debate, the U.S. Supreme Court ruled, in *Babbitt v. Sweet Home*, that the ESA prohibited habitat destruction, even on private lands. *Babbitt v. Sweet Home* represented a huge shift in environmental law, but it was the product of more than half a century of science and policymaking.<sup>7</sup>

Since the passage of the ESA and the emergence of conservation biology, almost all debates about wildlife, endangered species, and biological diversity have focused on habitat loss and conservation. Habitat has become a key concern for government agencies, as well as private firms and individuals whose projects require federal approval. Environmentalists have embraced the concept of habitat as a way to build support for their programs, and they have used it to justify the expansion of land trusts, mitigation banks, wildlife refuges, open space preserves, national and state parks, and wilderness areas. In some regions, this has resulted in a comprehensive remapping of the landscape, from spaces dominated by extractive industries to new reserve area networks governed by regional habitat conservation plans.

The status of habitat in contemporary American society represents a dramatic shift in political power over lands and natural resources. This shift has had mixed results for endangered species. Habitat conservation has saved many species from extinction, but it has fostered few, if any, recoveries. Most endangered species that have rebounded to self-sustaining population levels became endangered due mainly to hunting, pollution, or invasive species. These are all forms of habitat degradation, of course, but their solution has not required the protection of more land as nature reserves, or "set-asides." In other cases where efforts to save endangered species have led to regional transformations in land management—as with the northern spotted owl in the Pacific Northwest and the desert tortoise in the Mojave—the establishment of vast new reserve networks has not halted the species' decline. And worse, there is increasing evidence that, in some places, efforts to protect species by removing disturbances or restoring their habitats has contributed to further population reductions.<sup>8</sup>

The traditional bias toward natural areas in American ecology and conservation has encouraged environmental activists to imagine endangered species as

inhabiting pristine wilderness areas. But as any biologist will tell you, habitat is where a species lives, not where activists imagine or desire that species to live. Beginning in the 1930s, and then increasingly since the 1970s, activists have gone beyond linking wildlife with wilderness. They now regularly conflate the two. This has enabled them to conserve much land in the name of habitat. Yet drawing lines on a map does not necessarily lead to the recovery of endangered species, and there is no guarantee that once a space is set aside any particular species will remain. Habitat protection is a cornerstone of conservation, but it is not a panacea.

The emergence of habitat as an organizing framework for wildlife management has been one of the most important developments in American conservation history. Yet if activists today hope to preserve biodiversity in a manner that also promotes sustainable land use, then the time has come for a new approach that disentangles the biological needs of wildlife from the environmentalist goal of land preservation in the form of set-aside reserves. The two will often overlap but not always. This will add yet another layer to an already complex story. But then again, habitat has never been a simple thing.

*Peter S. Alagona is an assistant professor in the Department of History and Environmental Studies Program at the University of California-Santa Barbara.*

## NOTES

1. Bob Wilson alludes to this issue in his essay on the Fish and Wildlife Service as part of this forum.
2. "Habitat," *The Oxford English Dictionary* (Oxford: Oxford University Press, 1989); Victor E. Shelford, ed., *Naturalist's Guide to the Americas* (Baltimore: Williams & Wilkins, 1926), 3.
3. Sara F. Tjossem, "Preservation of Nature and Academic Respectability: Tensions in the Ecological Society of America, 1915-1979" (PhD diss., Cornell University, 1994); Shelford, *Naturalist's Guide*, 3.
4. Sally K. Fairfax, Lauren Gwin, Mary Ann King, Leigh Raymond, and Laura A. Watt, *Buying Nature: The Limits of Land Acquisition as a Conservation Strategy, 1780-2004* (Cambridge: MIT Press, 2005), 103-106.
5. Alfred Runte, "Joseph Grinnell and Yosemite: Rediscovering the Legacy of a California Conservationist," *California History* 69:2 (Summer 1990): 170-81; Richard West Sellars, *Preserving Nature in the National Parks: A History* (New Haven: Yale University Press, 1997); Thomas Dunlap, "Wildlife, Science, and the National Parks, 1920-1940," in *A Sense of the American West: An Anthology of Environmental History*, ed. James E. Sherow (Albuquerque: University of New Mexico Press, 1998), 148-50; Craig L. Shafer, "Conservation Biology Trailblazers: George Wright, Ben Thompson, and Joseph Dixon," *Conservation Biology* 15:2 (April 2001): 332-44.
6. Robert M. Wilson, "Directing the Flow: Migratory Waterfowl, Scale, and Mobility in Western North America," *Environmental History* 7:2 (April 2002): 247-66; Robert M. Wilson, *Seeking Refuge: Birds and Landscapes of the Pacific Flyway* (Seattle: University of Washington Press, 2010).

7. Shannon Petersen, *Acting for Endangered Species: The Statutory Ark* (Lawrence: University of Kansas Press, 2002), 30-35; U.S. Supreme Court, *Babbitt v. Sweet Home*, 515 U.S. 687 (1995).
8. Eric Stokstad, "Learning to Adapt," *Science* 309 (July 29, 2005): 688-90; Richard C. Tracy, R. Averill-Murray, W. I. Boarman, D. Delehanty, J. Heaton, E. McCoy, D. Morafka, K. Nussear, B. Hagerty, and P. Medica, *Desert Tortoise Recovery Plan Assessment*, prepared for the U.S. Fish and Wildlife Service, 2004.