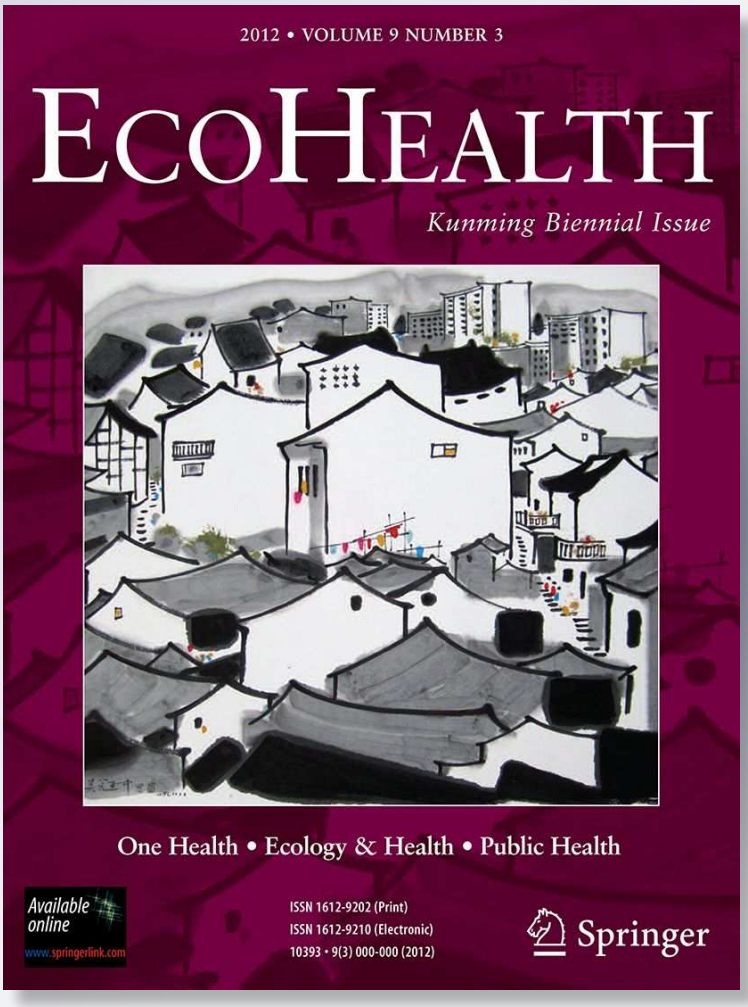
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Original Contribution

Aldo Leopold's Land Health from a Resilience Point of View: Self-renewal Capacity of Social–Ecological Systems

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Abstract: Health approaches to ecology have a strong basis in Aldo Leopold's thinking, and contemporary ecohealth in turn has a strong philosophical basis in Leopold. To commemorate the 125th anniversary of Leopold's birth (1887–1948), we revisit his ideas, specifically the notions of stewardship (land ethic), productive use of ecosystems (land), and ecosystem renewal. We focus on Leopold's perspective on the self-renewal capacity of the land, as understood in terms of integrity and land health, from the contemporary perspective of resilience theory and ecological theory more generally. Using a broad range of literature, we explore insights and implications of Leopold's work for today's human–environment relationships (integrated social–ecological systems), concerns for biodiversity, the development of agency with respect to stewardship, and key challenges of his time and of ours. Leopold's seminal concept of land health can be seen as a triangulation of productive use, self-renewal, and stewardship, and it can be reinterpreted through the resilience lens as the health of social–ecological systems. In contemporary language, this involves the maintenance of biodiversity and ecosystem services, and the ability to exercise agency both for conservation and for environmental justice.

Keywords: Aldo Leopold, ecosystem health, resilience theory, environmental ethics, environmental health

Introduction

Aldo Leopold struggled with the assumptions of his time about the qualities of human needs and the character of appropriate relationships between exploitation and conservation. His conclusion was that the need to maintain places for wild nature, in all its diversity, outstripped the need for producing "more bathtubs" if health in society or in land was to be maintained. In our globalized and globalizing world, this struggle continues in the efforts of contemporary researchers to understand interactions within complex social–ecological systems, and to address the tension between wild nature and human health and well-being.

For Leopold, land health was at risk due to society's preoccupation with economic health, equated with growth (Leopold 1949, reprinted 1966, p. xix). He located the resulting "sickness" in the values of a society that mistook the relationship with its biotic community as a right to commodify and exploit "land" incrementally and instrumentally, seeing nature in parts or as mere resources rather than envisioning the greater whole. The challenge to land

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health amounted to "…a society so obsessed with its own economic health as to have lost the capacity to remain healthy" (Leopold 1949(1966), p. xix). Further, he saw humans and land as "two organisms that have been subjected to human interference and control", the first by "medicine and public health", the second by "agriculture and conservation" (Leopold 1949(1966), p. 272).

The symptoms of "land sickness" that Leopold identified include population dynamics and conservation issues familiar today: disappearing species (loss of biodiversity), pest invasions (invasive species), and irruptions and declines (population explosions and collapses). "Land health" as a term, like others used by Leopold, may have lost some of its appeal. The concept, however, remains fresh. Scientific advances since Leopold's time now enable a more rigorous, quantitative analysis of the relationships between broad-scale pattern, process, and scale in space and time (Levin 1992, 1999). Our enhanced ability to document and analyze changes in the land, and the increasing contributions of long-term scientific datasets (remotely sensed data from Landsat, for example) allow rigorous documentation of many of the broad-scale ecological trends—forest loss, declines in soil fertility, and reduction in wilderness areas—that Leopold was most concerned about. Now more than ever, Leopold's fundamental message—the importance of a land ethic and its relevance for society—is of critical importance for the future of humanity.

Here we examine Leopold's notions of stewardship (land ethic), productive use of ecosystems (land), and ecosystem renewal. In particular, we focus on Leopold's perspective on the self-renewal capacity of the land, as understood in terms of integrity and land health, from the contemporary perspective of resilience theory and ecological theory in general. Resilience thinking offers a way in, a place to stand, giving a broader perspective than generally obtainable from single sector or single disciplinary focus. We explore the insights and implications of elements of Leopold's work in relation to resilience thinking about social–ecological systems, contemporary concerns for biodiversity, contributions to the development of agency with respect to stewardship, and key challenges of his time and of ours.

Historic Context of Land Health

Leopold scholar Baird Callicott focuses on two main essays in discussing the concept of land health: "Wilderness as a land laboratory" (Leopold 1941) and "Conservation: in whole or in part" (Leopold 1991). For Leopold, land health was "the capacity of the land for self-renewal" (Callicott 1999, pp. 333–345). Land, which we would now call ecosystem, normally has capacity for self-renewal. Loss of this capacity could be detected by symptoms obvious to conservationists, such as "soil erosion and loss of fertility, hydrological abnormalities, and the occasional irruptions of some species and the mysterious local extinctions of others" (Callicott 1999, p. 339). Leopold's land health is tied to the integrity of the biotic community, and he makes qualified statements about stability and the idea of land as an organism. Although he was a proponent of wilderness, "he devoted himself primarily to the conservation of humanly occupied and used ecosystems" (Callicott 1999, p. 344).

Is land health merely a metaphor? To answer this question, it is first necessary to sketch the development of Leopold's thinking and how his views were shaped by the events and thinkers of his age.

Several Leopold scholars have commented on Leopold's shift from his early, progressive conservationist view to a preservationist view. Trained in the Pinchot-inspired and endowed Yale Forest School in the early 1900s, Leopold came from a background of progressive utilitarian management. Meine (1988) traces how Leopold came to terms with the implications of his progressive conservationist views, his increasing appreciation of the complexity in nature, and his decreasing confidence in single-species management and the thinking behind it. Mitman (2005, p. 185) further observes that the shift in Leopold's attitudes, and the development of the land health concept, was not based only on his experiences and observations alone but was "grounded on the historical, material and social relations of knowledge and place".

Specifically, one major influence was the emerging limitations of the germ theory that claimed disease could be readily traced to a single external agent. Following the initial success of the theory in the late 19th century, a number of events in the interwar years, such as the 1918–1919 influenza epidemic, had sparked a renewed interest in a more integrated understanding of disease in which the relationship between the individual and its environment regained importance. Instead of locating illness in a single cause, the microbe, some biologists and medical scientists in the interwar years looked instead to the ancient Greek physician Hippocrates who considered health as a state of equilibrium between the organism and its total environment (Mitman 2005).

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Thus, Leopold's land health metaphor introduced in the 1930s, and his broader interest in the total environment, was not at all accidental but rather reflective of the critical thinking of its time. Mitman (2005) further points out that Leopold's association with two key individuals was important in the development of the land health concept. One was the physiologist Walter Cannon, the father of the concept of homeostasis that refers to the self-balancing act of the body. His conception of pathology was informed not by bacteriology but by physiology, and the importance of controlled equilibrium that characterizes a healthy organism. In the context of the 1930s Dust Bowl, Leopold began to see society and land collectively as an organism, an organism that had developed pathological symptoms, with self-accelerating rather than self-compensating departures from the normal (Mitman 2005). Originally articulated at a Sigma Xi chapter talk at the University of Wisconsin, these ideas were later fleshed out in *A Sand County Almanac* as land health or the capacity of self-renewal.

Charles Elton was the other formative influence on Leopold. Elton was the leading ecologist of his day, and an expert on the growth dynamics of parasite, pest, and wildlife populations. Leopold's understanding of population cycles and use of the term irruptions owes much to Elton. An advisor to the British Colonial Office on diseases such as malaria and sleeping sickness, Elton himself was interested in medical analogies. He regarded disease as mainly an ecological issue; it was to be seen as a symptom, not a cause, of imbalance in organism–environment relationships. He became, according to Mitman (2005, p. 190) "Leopold's guiding counsel on matters of professional ecology and a dear and trusted friend".

Resilience and Social–Ecological Systems

The development of resilience concepts has many parallels to the development of the land health idea, and we argue in this paper that Leopold's seminal concept of land health can be reinterpreted and extended through a resilience lens. The concept of resilience originally came from ecology, based on observations of the dynamics of the boreal forest ecosystem, its renewal cycles, uncertainties, and abrupt shifts (Holling 1973). Recognizing that many ecosystems, in addition to the boreal forest, often exhibited such behavior, C.S. (Buzz) Holling sought a way to characterize the capacity of a system for self-renewal, and its ability to maintain itself in the face of disturbance *or* shift to a new equilibrium. How can a changing ecosystem remain within critical thresholds, as opposed to shifting into a new equilibrium? Some four decades of development of resilience theory have been an elaboration and extension of these ideas (Gunderson and Holling 2002; Norberg and Cumming 2008; Scheffer 2009; Chapin et al. 2009).

Holling's resilience is basically about the capacity of a system to continually change and adapt and yet remain within critical thresholds. It may be formally defined as the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks (Walker et al. 2004). In its broader context, resilience is about ecosystems and people together as integrated social–ecological systems in which social systems and ecosystems are recognized to be coupled, interdependent, and co-evolving (Berkes and Folke 1998).

Studies that have critically examined social–ecological systems have found them to be something more than the sum of social systems and ecological systems (Westley 2002; Liu et al. 2007). Much of the resilience literature from about 2000 onwards adopted the term, social–ecological system, as it is clear that we are dealing with what Leopold today would have called, humanly occupied and used ecosystems (Folke 2006; Berkes 2011). Thus, like Leopold, resilience scholars are concerned with human-influenced and human-shaped ecosystems, which are at least as topical now as in the Dust Bowl years of the 1930s and a necessity of the Anthropocene era (Chapin et al. 2009). Hence, the social–ecological system as unit of study may be considered appropriate to capture the Leopold concept of land as the biophysical environment plus people.

Resilience scholars, like Leopold, are centrally interested in the renewal cycles or self-renewal of the land (ecosystem). They are concerned not only with the capacity of the land for self-renewal that is in part tied to the integrity of the biotic community (biodiversity) but also with the dynamics that can flip the system into a new locally stable state, as in small highland lakes in Leopold's Wisconsin (Carpenter 2003). Resilience scholars, again like Leopold, reject single-species management and reductionism in general, and recognize nature's complexity. Indeed, they deal with ecosystems and social–ecological systems as complex adaptive systems (Norberg and Cumming 2008) but do not use the metaphor of land as an organism. Nor do they talk about stability and balance, but about multiple

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equilibria and multi-scale dynamics (more on this in the next section).

Leopold's land health concept considers disease as a function of the relationship between the individual and the environment. By contrast, only a small part of the resilience literature uses medical thinking. Examples include Janssen (2001), Cumming (2010), Cumming et al. (2011), and Ommer (2007). *Coasts under Stress*, the book by Ommer and team, is about resource-dependent communities on the Atlantic and Pacific coasts of Canada. It develops a social–ecological health approach that includes the social, cultural, and psychological dimensions of health. It aims to link the functioning of social–ecological systems to their health and well-being, and to produce a holistic view of interactions between humans and their environment, an approach taken by Waltner-Toews and Wall (1997) and Parkes et al. (2010) as well.

In this approach, the health of communities may be defined as an emergent condition of the system in which the social, economic, and political components are organized and maintained in such a way as to promote both human and natural environmental well-being so that the community experiences relatively high levels of social support, a culturally acceptable standard of living, less rather than more inequality, and similar benefits that augment individual and social well-being (Ommer 2007, p. 18).

In such a view, social–ecological health and resilience are interdependent, and exist together in a particularly powerful relationship in resource-dependent communities, such as those on Canada's Atlantic and Pacific coasts (Ommer 2007). It is a two-way relationship: a healthy biophysical environment provides livelihoods and well-being for a healthy community; a healthy community is able to make a living from a healthy biophysical environment. The approach provides a way to re-interpret Leopold's land health, and unpacks the human dimensions of the resilience concept.

Biodiversity and Ecosystem Services

Leopold's main interest was not untouched ecosystems but land occupied by people and productively used. Many of Leopold's concerns arose from his first-hand impressions of the distinctions between ecosystems that were heavily impacted by people and those that were relatively untouched. One of the most obvious elements of any ecosystem is the species that occur within it. The diversity of these species, and the ways in which their diversity has changed over time, offer important clues into long-term trends and changes in the ecosystem. Assessments of biodiversity have thus become, with good reason, one of the dominant ways of evaluating ecosystem integrity.

Leopold recognized the importance of biodiversity for system function, and the dangers of species loss, as encapsulated in his often-quoted statement that "to keep every cog and wheel is the first precaution of intelligent tinkering" (Leopold 1966, p. 190). In ecology, the idea that redundant species provide resilience to species loss is termed the insurance hypothesis (Loreau et al. 2001; Walker 1992). Having many species that perform the same function means that if an individual species is removed from the system, other species may fulfill its ecological role, with no functional consequences for the system as a whole (e.g., Naeem 1998; Walker et al. 1997). More generally, diversity (biological and cultural) is intricately related to system resilience because the ability of a social, ecological, or social–ecological system to cope with novel conditions or a new challenge often depends on having a diversity of response options (Norberg et al. 2008).

Diversity persists because each organism occupies a unique niche in the larger system. Niches are not independent entities. Ever since Charles Elton (1927) first described the trophic pyramid, ecologists have been aware that the first law of thermodynamics drives ecological communities to self-organize into trophic levels. Change in many complex systems is episodic, with long periods of relative stability alternating with short periods of dramatic change. One of the reasons why change is episodic is that most complex systems are buffered by self-reinforcing feedbacks. For example, if a shallow lake contains macrophytes and an intact food web with substantial populations of zooplankton and fish, it can exist in a clear-water state well beyond a level of nutrient loading that would otherwise push it into a turbid state (Carpenter and Kitchell 1993). The destruction or removal of key feedbacks is often a consequence of human interventions in ecosystems, and often has negative consequences for both ecosystem integrity and human and animal health (e.g., Carrete et al. 2009). Leopold highlighted the importance of ecological feedbacks through his concerns over game management strategies that involved predator removal:

> Since then I have lived to see state after state extirpate its wolves. I have watched the face of many

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> a newly wolfless mountain, and seen the south-facing slopes wrinkle with a maze of new deer trails. I have seen every edible bush and seedling browsed, first to anemic desuetude, and then to death. I have seen every edible tree defoliated to the height of a saddlehorn. Such a mountain looks as if someone had given God a new pruning shears, and forbidden Him all other exercise (Leopold 1949(1966), p. 139)

Leopold was deeply concerned, like many modern scholars, by the loss of top-down controls on ecosystems. Recent research shows that removal of top predators can result in trophic cascades (Carpenter et al. 2008; Carpenter and Kitchell 1993; Pace et al. 1999), affecting not just prey populations but entire food webs, including parasites and pathogens. In addition, the removal of top predators can result in the disproportionate and/or prolonged survivorship of unhealthy animals, creating a higher overall burden of disease within the system. Resilience, ecosystem health, and animal and human health are thus closely connected through trophic cascades and other self-reinforcing feedbacks (Scheffer et al. 2005). Estes et al. (2011) have highlighted the loss of apex predators as possibly being the most pervasive human impact on nature.

Much work has been done by ecologists on what Leopold would call productive use of the land. From a human use perspective, biodiversity translates in a variety of non-trivial ways into ecosystem services. Functional ecosystems provide the long-term delivery of ecosystem goods and services—the things that people get from nature. Ecosystem services were characterized by the Millennium Ecosystem Assessment (MA 2003) under the primary categories of provisioning, regulating, cultural, and supporting services. The resilience of each of these different kinds of service depends heavily on the resilience of the organisms that provide it, which in turn is heavily contingent (in today's human-modified world) on technology and culture. For example, the resilience of apex predators and the services that they provide (e.g., disease regulation by vultures) appears to be considerably lower than the resilience of primary consumers and the services that they provide (e.g., nutrient cycling by soil microbes) (Dobson et al. 2006). Leopold's land health and contemporary ideas about resilience thus offer closely complementary perspectives (Fig. 1). If human health and well-being are seen as key elements of ecosystem service provision, a focus on ecohealth provides a meeting point for linking the ecological and social elements of the system.

The provision of ecosystem services is rapidly becoming the dominant way of evaluating the productive use of ecosystems. Economic arguments for the value of ecosystem services are perceived to provide additional support for conservation biology (e.g., Ehrlich and Ehrlich 1992; Pimentel 2001; Wilson and Carpenter 1999). Analysis of ecosystem services does not on its own, however, provide a moral compass for the difficult decisions that must be made in relation to land use and the tradeoffs between different kinds of ecosystem service (Rodríguez et al. 2006). It is here that Leopold's concept of a land ethic, as translated through contemporary ideas about stewardship, environmental ethics, and environmental justice, is needed more than ever. As Leopold so pithily said, "quit thinking about decent land use as solely an economic problem" (Leopold 1949(1966), p. 262).

Stewardship as Agency

> Examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient. 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 1949(1966), p. 262).

Land and social–ecological system health does not occur in a vacuum, it also requires agency in the form of stewardship, a vital and active application of a land ethic. Concepts of stewardship are familiar in the resilience literature also (Chapin et al. 2010), often rooted in a strong sense of place. For example, the traditional Hawaiian *ahupua'a* is a cultural landscape which provides self-identity for persons and groups as the people of that landscape, and which embodies the co-evolution of Hawaiians with their environment (Kaneshiro et al. 2005). Another example of a cultural landscape in the northern edge of the boreal forest, is the various ways (e.g., controlled burning, construction of mud dykes, and the cutting of corridors in the coastal forest) in which Cree people managed their land for waterfowl production (Sayles and Mulrennan 2010).

A scientist, forester, naturalist, fisher, hunter, and story teller, Leopold was first and foremost a steward of the lands and creatures that he loved. His relationship with land and wildlife was one of engagement, participation, and agency, both personally and professionally. We should remember as

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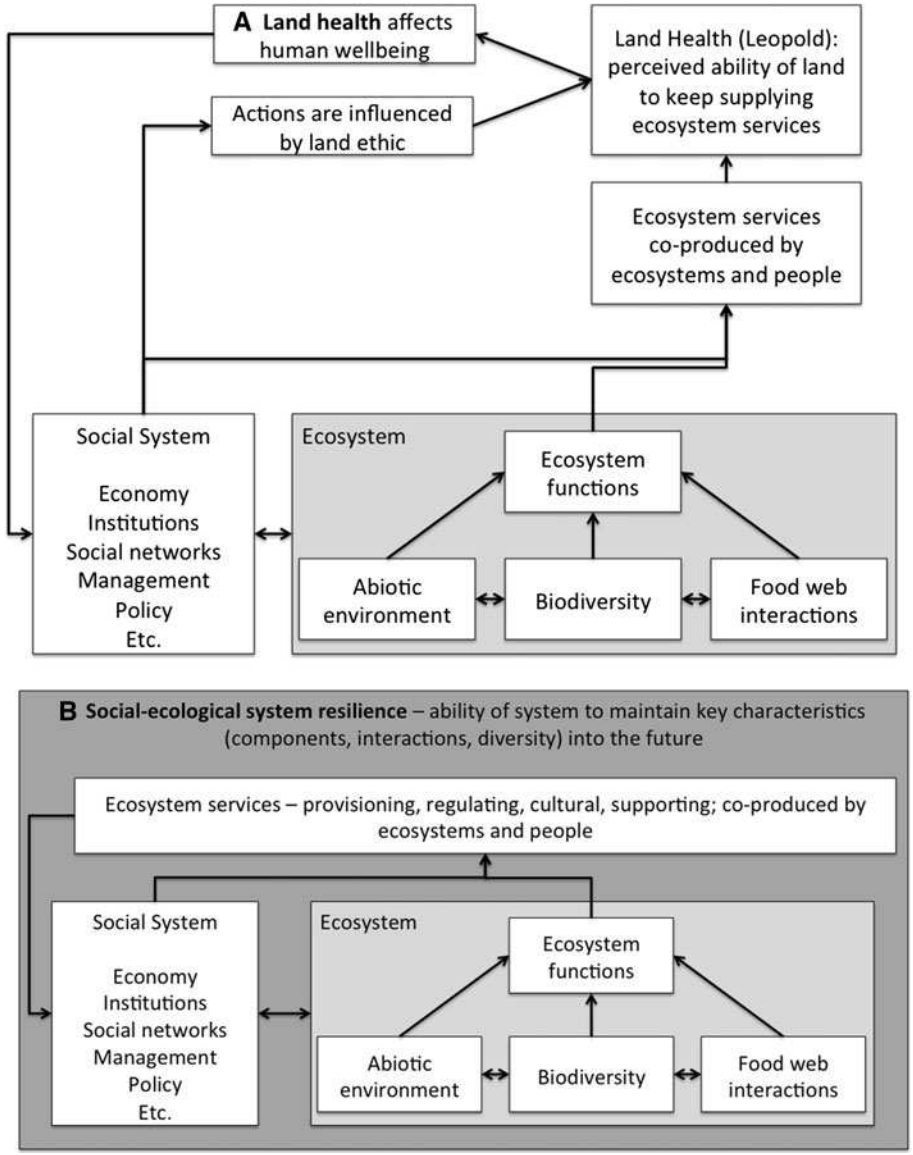


Figure 1. Conceptual relationships between biodiversity, ecosystem function, ecosystem services, land health, and resilience. In both (**A**, **B**), ecosystem services are seen as co-produced by ecosystems and the people who rely on the services (as with conservation, the concept of ecosystem service only makes sense when interpreted in light of human needs). People rely on ecosystems to satisfy their needs including health (MA 2003). **A** Integration of current ideas about ecosystem function and ecosystem services with Leopold's concept of land health. **B** The contemporary notion of social–ecological resilience is broader and more inclusive than the idea of land health, with resilience seen as an emergent property of multi-scale dynamics in linked systems.

we celebrate his birth that he died fighting a forest fire. The efficacy of his message draws its power in part from his deep knowledge of species and their interrelationships, of connections among environmental changes and human actions, and from his ability to draw on historical horizons and multiple scales, as a foundation for understanding landscape transformations through space and time. Most importantly, his message draws from his own sense of self-efficacy and his love for the land. Leopold's ability to recognize interdependencies and interconnections in and across landscapes (while seeing the land as a living organism) resonates strongly with our use of resilience thinking as a source of social–cultural–ecological framings that allow us to draw informed parallels between the concept of land health developed by Leopold and elucidated by Leopold scholars, and the health of social–ecological systems.

It is precisely because of this foundational thinking for ecological action, coupled with his experience of

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environmental interventions, that Leopold is able to speak to resilience and stewardship through his analysis of conservation and his sense of agency. Here agency is used to refer to the capacity of an individual to act independently and make free choices (Brown and Westaway 2011). First, in the context of wilderness, Leopold concludes:

> It follows, then, that any wilderness program is a rearguard action, through which retreats are reduced to a minimum. The Wilderness Society was organized in 1935… It does not suffice, however, to have a few such societies, nor can one be content that Congress has enacted a bill aimed at wilderness preservation…*a militant minority of wilderness-minded citizens must be on watch throughout the nation and vigilantly available for action* (Leopold 1949(1966), pp. 278–279, emphasis added).

Second, Leopold speaks of recreational development, concluding that it is "…not a job of building roads into lovely country, but of building *receptivity* into the still unlovely human mind." (Leopold 1949(1966), p. 295, emphasis added). Here we glimpse a form of agency developing into a relational and reciprocal version, whereby the agent both transforms the wild and is also transformed by it. Leopold's reciprocal agency is relevant in the Anthropocene, recognized by Gibson-Graham and Roelvink (2010) as both encompassing and requiring agency among citizens, just as Leopold's land ethic requires vigilance. Calls for agency and vigilance may be found in the work of other influential contemporary scholars as well, such as Amartya Sen (1999). Sen's *Development as Freedom*, which posits an ethic of social and environmental justice predicated on capability, is part of an emerging activist tradition in economics. The concept of agency appears in multifold contexts: within adaptive management, for example, as part of the dynamics of social learning (Armitage et al. 2007), or as part of a new social contract and adaptive response to climate change (O'Brien et al. 2009).

With respect to wilderness-mindedness, Leopold continues, saying:

> Ability to see the cultural value of wilderness boils down, in the last analysis, to a question of intellectual humility. The shallow-minded modern who has lost his rootage in the land assumes that he has already discovered what is important: it is such who prate of empires, political or economic, that will last a thousand years. It is only the scholar who appreciates that all history consists of successive excursions from a single starting-point, to which man returns again and again to organize another search for a durable scale of values. It is only the scholar who understands why the raw wilderness gives definition and meaning to the human enterprise (Leopold 1949(1966), p. 279).

Arguably, this passage concerning periodicity and the cyclic nature of human concerns, can be understood as foreshadowing the blurring of figure and ground, as in actor-network theory. The underlying idea is one of dissolving dualisms (Castree and MacMillan 2001) and the bridging of dichotomies as pursued by Latour (1993). Latour's declaration, "we have never been modern", implying the falseness of the disconnect between humans and nature, celebrates Leopold's sense of the underlying truth of "rootage" as a fact of human existence. Following Latour (1998), Castree and MacMillan (2001, p. 221) express similar thinking in spatial terms, concluding that "for actor-network theorists, *all* forms of political thinking and action must have an environmental dimension, for the *spaces of nature* cannot be confined to a few fast-shrinking areas" (emphasis added).

Once we open the door to the idea that context and thinking engage, reciprocity becomes one possible form of this engagement. Here is a portal to access the metaphors of resilience thinking, the nested loops of the adaptive cycle, where decisions in a particular context, time, or place are understood to influence the possibilities elsewhere (Gunderson and Holling 2002). Or to an appreciation of the role of individuals and groups as understood within resilience work by Westley (2002) and others who recognize the capacity of individuals and groups as actors and change agents.

What we now see emerging through a resilience lens is situated at the intersection of Leopold's "wilderness-minded citizen" and the constitution of new forms of stewardship and new roles of agency. It includes a systematized understanding of several elements: the ability to maintain the use of ecosystem services as measure of productive use (MA 2003; Carpenter et al. 2009); complex system attributes of ecohealth in connecting ecosystem health to human health (Neudoerffer et al. 2005; Cumming et al. 2011); and adaptive management or learning-by-doing, preferably in a participatory way (Armitage et al. 2007). And so we complete the circle: land health is ecohealth, and ultimately citizen health is contingent on human agency directed to the maintenance of wilderness, both inwardly and outwardly.

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Conclusions

Leopold's seminal concept of land health can be seen as a triangulation of productive use, self-renewal, and stewardship. It can be reinterpreted and extended through a resilience lens as the health of social–ecological systems (Fig. 1). It involves, in contemporary language, the maintenance of biodiversity and ecosystem services, and the ability to exercise agency both for conservation and for environmental justice. Despite more than 60 years of subsequent scientific endeavor, the concept of land health remains both relevant and important for contemporary society. The connections that Leopold saw between ecosystems and biodiversity on the one hand and human social and political processes on the other, as well as their meeting points in management and policy, are increasingly becoming the foundation of a contemporary science of sustainability (Chapin et al. 2009)—and also of conservation ecology (Carpenter et al. 2009) and, as we argue here, of ecohealth.

Leopold's thinking was influenced by the renewed interest, after the 1918–1919 influenza epidemic in an integrated understanding of human health and disease. He saw disease as an ecological health issue, an imbalance in organism–environment relationships. Leopold understood that the process of living in, experiencing, and caring for the land shapes human consciousness and attitudes, creating a feedback from ecosystems to social systems that in turn modifies and directs relationship regarding land health. The significance of this interaction is being appreciated only recently (Neudoerffer et al. 2005; Parkes et al. 2010; Muir et al. 2010).

Leopold's thinking goes beyond the mere science of biodiversity and ecosystem services, in the sense that it calls for a personal response to environmental change—vigilance and action. Such a response becomes the basis for developing a sense of agency, individually, collectively, and institutionally, and provides the missing ingredient in scenarios of change, such as those of the Millennium Assessment (2005) in which it is recognized that change must occur, but the origins of change (and particularly of shifts in societal attitudes) are unclear.

Leopold's land health dissolves the false dichotomy between human and environmental health, just as Latour's (1993) actor-network theory dissolves dualisms of figure and ground, and resilience theory dissolves dualisms of social systems and ecological systems. Leopold challenges us as citizens to exercise agency, as Sen (1999) does in economics and development. In the Anthropocene age in which urban populations are increasingly alienated from nature, Leopold's insights—that a land ethic begins with knowing and loving the land, and committing to citizenship within it—have never been more important to understand.

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