# Deriving Moral Considerability from Leopold's *A Sand County Almanac*.*

BEN DIXON

*Stephen F. Austin State University*

*P.O. Box 6082, SFA Station*

*Nacogdoches, TX 75962-6082, USA*

*Email: bendixon04@gmail.com*

*This document is a penultimate draft of a final version appearing as "Deriving Moral Considerability from Leopold's *A Sand County Almanac*,"—*Ethics Policy and Environment*, vol. 19.2 (2016). Please refer to the published version if citing, as it does contain some changes.

## 1. Introduction

We are not far off from the 70th anniversary of Aldo Leopold's *A Sand County Almanac* (1949). The influence of this work is tremendous, especially within the field of environmental ethics. Of particular import for environmental philosophers is the seminal essay contained therein, 'The Land Ethic.' In that essay, Leopold, the father of conservation biology, briefly discusses the evolution of ethics. He generally observes that human morality has evolved through a gradual extension of ethical concern to both previously excluded modes of conduct and persons theretofore unconsidered. Leopold then famously suggests that the next step in human moral development is for persons to extend moral consideration to 'the land'—to soils, to waters, to plants, and to animals. Leopold urges that adopting the following land ethic principle ensures an appropriate extension of moral respect toward nature: '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' (1949, pp. 224-225).

Many environmental ethicists, rather than understanding Leopold's moral views as the provocative but incautious musings of a non-philosopher, have seized upon his moral ideas, enfranchising them as one of the earliest attempts at depicting a reasonable environmental ethic. Yet, for all the ink spilled both analyzing Leopold's views and providing greater systemizations of his arguments, it is unclear that there is regularly a correct understanding of (1) why Leopold truly thinks biotic wholes possess moral value, and (2) what such an understanding surprisingly implies about the moral value generally found within individual nonhuman organisms. My essay aims at clarifying Leopold's ideas on both these points. Such clarification comes by way of arguing that it is a type of thriving that is of basic moral importance to Leopold.[1] For Leopold this thriving is captured by the idea of health.

To make my case, the essay unfolds as follows. First, I depict Leopold's general arguments in the 'Land Ethic' for why biotic wholes are morally valuable—why it is that the idea of their health (or as I will sometimes put it, their thriving in a particular way) is ethically fundamental. Those acquainted with Leopold's 'Land Ethic' essay will likely find this first section's attending exposition familiar. The useful refresher here, one that is inclusive of those details salient to the case that ultimately needs making, traverses this recognizable territory to arrive at what I think is a novel and significant destination: discovering what actually makes nature morally considerable for Leopold.

Next, I review an important qualification that philosopher J. Baird Callicott gives to an analogy Leopold uses in making his arguments, a qualification centering on Leopold's problematic analogizing of ecosystems to organisms. Third, I argue that the way in which Callicott ultimately interprets and updates Leopold on this point is not

completely faithful to the logic of Leopold's text. This is hugely important, as Callicott has done more than any other thinker to explain and to champion Leopold's land ethic; the upshot of this influence being that Callicott's interpretation(s) of Leopold provide the lens through which others often filter and evaluate Leopold's ideas. Thus, if I am ultimately correct in my differing take on Leopold, many influenced by Callicott may be holding mistaken views as to what Leopold's ethics really entail. Lastly, I provide the necessary corrective for fully understanding Leopold's analogizing of ecosystems to organisms, further showing its implications for finding moral value in natural entities besides ecosystems, specifically individual organisms. Indeed, examples are given of where Leopold himself highlights the moral considerability of individuals and their capacities. These implications, I argue, are far reaching for anyone attempting to understand a land ethic that is faithful to the logic of Leopold's own thinking. My overarching goal, then, is contributing toward a better understanding of *A Sand County Almanac*, generally, and of 'The Land Ethic' essay, specifically, as both are rightly still so influential nearly 70 years after their initial publication.

**2. Leopold's Invitation to Morally Progress**

It is in Part IV of *A Sand County Almanac* that Leopold formally starts to lay out his land ethic. He sets up his discussion with musings about the Homeric character Odysseus, and how upon his return from Troy, the epic-figure hung his slave-girls for suspected misbehavior. Leopold implies that if Odysseus or any of his contemporaries would have questioned the rightness of this action, given their moral milieu, they would likely have been charged with making a category mistake (i.e., they would be charged with wrongly placing slaves in the category of 'morally considerable entities' instead of

that category's opposite, 'disposable property'). After all, Odysseus's culture acknowledged these women to be his property, and expediency was—in the Greece of Odysseus's day—and is—in Leopold's United States and beyond—the norm that ranges over the disposal of property (1949, pp. 201-202).

When fast-forwarding three thousand years to the time Leopold is writing his essay, he states that one cannot help but notice the occurrence of a moral progression over that time. Ethical criteria, Leopold observes, now have come to range over more human activities than in Odysseus's era, with those activities judged solely by expediency having correspondingly shrunk (1949, p. 202). Leopold thinks that it is possible to outline the evolution of some of this progress. For example, he claims that the first ethics codified by humans concerned how individuals ought, interpersonally, to treat one another. The Ten Commandments, he suggests, were an example of this. Hereafter were added norms regarding an individual's relationship with society, Leopold explaining that the Golden Rule is an attempt at integrating the individual to society, while democracy tries to reconcile 'social organization to the individual.' What has not been instituted as of yet, he reasons, is an ethic that governs a 'third element in human environment'—the relations of humans to the land and to the organisms that grow on it (1949, pp. 202-203). (Leopold later collects these morally underprivileged things—soils, waters, plants, and animals—and labels them collectively as 'the land.') (p. 204).

In 1948 when he is writing this essay, Leopold saw that humanity's relationship to the land was much like Odysseus's relationship with his slave girls—an economic one. Hence, like the owning of slaves long ago, possession of land entails privileges but not obligations (1949, p. 201). And so, Leopold surmises, the next step in human moral

evolution is to extend moral consideration to the land. Doing so, he claims, is both '[. . .] an evolutionary possibility and an ecological necessity' (p. 203).

Leopold very much wants to stress a relationship between ecology and ethics. For not only is it the taking-up of the ecological point of view that helps affirm the reasonableness of his land ethic—but he thinks that the very process of extending ethics to hitherto unregulated forms of conduct is a 'process in ecological evolution' (i.e., Leopold implies that this is a process wherein improved social interactions between entities betters their survival conditions). The stages of this evolution, Leopold maintains, can be described in both ecological and philosophical terms. He explains this idea, writing:

> An ethic, ecologically, is a limitation on freedom of action in the struggle for existence. An ethic, philosophically, is a differentiation of social from anti-social conduct. These are two definitions of one thing. The thing has its origin in the tendency of interdependent individuals or groups to evolve modes of co-operation. The ecologist calls these symbioses. Politics and economics are advanced symbioses in which the original free-for-all competition has been replaced, in part, by co-operative mechanisms with an ethical content (Leopold 1949, p. 202).

Leopold suggests that such co-operative mechanisms have become more complex with the passage of time—thus the aforementioned movement from the simplicity of the Mosaic Decalogue to the involvedness of democracy. This notion of an emerging complexity characterizing ethics is an important feature of Leopold's account, for he touts a naturalized explanation as to the origin of our ethical ideas. Ethics for Leopold, as

explained above, have emerged from the development of symbioses, or what we might today call 'mutualisms.'[2] Norms evolve and persist when following them creates reciprocal value.

The very way Leopold goes about defining ethics, then, reveals his commitment to a naturalized account of their emergence. In essence, Leopold thinks that humans have evolved into interdependent individuals or groups that display a tendency to formulate mechanisms for cooperation, among these mechanisms being ethics. Those ethical mechanisms can then be explained, philosophically, as providing for social ways of acting (as differentiated from antisocial ways), while an ecological explanation of those same mechanisms has them being described as limitations placed on freedom of action in the fight for survival. Explaining further the nature of ethics, Leopold borrows from both the philosophical and ecological ways of speaking about them and writes:

> All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in the community, but his ethics prompt him also to co-operate (perhaps in order that there may be a place to compete for). [. . .] The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land (1949, pp. 203-204).

In light of Leopold's characterization of ethics, a key question arises for the philosophically-minded reader: What is the conceptual impetus that prompts us humans to enlarge the boundaries of our moral community—to expand the subset of things containing that which is morally considerable? To begin formulating an answer from what Leopold provides, it is noteworthy that he claims that no significant change in ethics

has ever been made without persons altering their 'intellectual emphasis, loyalties, affections, and convictions' (1949, p. 209). Leopold further points out that broadening the notion of community was not something the conservation movement of his day was emphasizing. This is evidenced, he surmises, by the absence of conservation-talk in both philosophy and religion circles (p. 210). 'The Land Ethic' essay and other supportive ethical ideas found in *A Sand County Almanac*, it is then reasonable to think, presumably aim at putting forward ideas capable of persuading both the philosopher and the religionist that a broadened notion of community is justified. Leopold's strategy thus appears to be sensitizing a diverse readership to the values that biotic wholes embody and then to demonstrate how recognizing such values necessitates a change in our ethical behavior—a rather significant change.

Leopold understands that if he is to put forward a land ethic that both supplements and guides humans' existing economic relationship to the land, there must exist a way to represent the land as reasonably something more than just a storehouse of resources. This is why he puts forward arguments that the land, as a whole, is capable of being harmed and benefited. Leopold alludes to the need for such arguments when he writes: 'We can be ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in.' The representation of the land that he thinks capable of evoking claims of its moral value is the ecological image known as 'the land pyramid' (1949, p. 214).

The land pyramid is a symbolic way of depicting the interdependence of life on earth. Beginning with the claim that the sun provides the energy for life,[3] Leopold explains that this energy flows through circuitry called the biota. To facilitate a clear

understanding of this circuitry, Leopold requests of his readers the picturing of a layered pyramid. As he goes about conceptually stacking this pyramid, Leopold identifies the soil as the bottom-most layer of the pyramid; it is a plant layer that sits on top of the soil; above the plants is an insect layer; a bird and rodent layer rests on the insect one; and the subsequent layers symbolize various other animal groups, all of which lead to the top-most layer, whereupon the larger carnivores sit. Leopold notes that each successive layer depends upon the ones below it for food and quite frequently for other benefits. The number of creatures in each layer decreases as the pyramid ascends. As for humans, they find themselves in an intermediate layer alongside fellow omnivores like bears, raccoons, and squirrels (1949, pp. 214-215.)[4]

What Leopold calls 'lines of dependency' can be drawn from benefit-providing members of the pyramid to other members receiving those benefits. These lines of dependency, he says, include food chains. For example, a modern-day food chain Leopold identifies is: 'soil-corn-cow-farmer;' he notes that this chain in the U.S. territory largely replaced that of 'soil-oak-deer-Indian.' Each of the species in these examples, however, serves as a link in numerous chains. Leopold informs his readers, for instance, that cows eat a hundred plants other than corn, and deer eat a hundred plants other than oak. This means that these two types of animals are members of multiple chains. The land pyramid, in fact, is an interweaving of such complex chains. The whole pyramid functions as its constituent parts both compete and cooperate with one another (1949, p. 215). In light of the land pyramid, Leopold thinks it fitting to redefine the term 'land' so that it becomes even more conceptually loaded. He writes:

> Land, then, is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals. Food chains are the living channels which conduct energy upward; death and decay return it to the soil. The circuit is not closed; some energy is dissipated in decay, some is added by absorption from the air, some is stored in soils, peats, and long-lived forests; but it is a sustained circuit, like a slowly augmented revolving fund of life (1949, p. 216).

Leopold goes on to write that the rate and character of the upward flow of energy within the pyramid relies on the 'complex structure of the plant and animal community, much as the upward flow of sap in a tree depends on its complex cellular organization.' Devoid of adequate complexity, normal circulation of the energy could cease (1949, p. 216). Note here Leopold's likening of the complex structure of the land to an organism, in this case, the complex cellular organization of a tree. (Leopold is not done likening the dynamics of the land to an organism).

Leopold then explains that change in one part of the circuit necessitates an adjustment in another part. Sometimes such changes are 'slow and local,' as with evolutionary changes (he claims that the net result of evolutionary changes has been to 'elaborate the flow mechanism and to lengthen the circuit'). Yet, at other times, changes can obstruct or divert the energy flow (pp. 216-217).[5]

Leopold makes clear that it is our invention of tools that has enabled us humans to make changes of this last type—changes, he says, that are of 'unprecedented violence, rapidity, and scope' (1949, p. 217). Of course, it is not the case, writes Leopold, that the entropic effects of these changes were in any great way intended or foreseen by us humans (not when he is writing *A Sand County Almanac*, at least), but the science of

ecology now makes possible a new moral and pragmatic awareness that gives these changes negative meaning. Leopold surmises that this new-found awareness of meaning necessitates the addressing of two important issues: 1) whether the land can adjust itself to the speed, scope, and force of human-made changes; and 2) whether the benefits of these human-made changes are attainable with less violence (pp. 217-218).

Because of their moral character, both the land being able to adjust itself to human-made changes and the violence that makes such changes possible are important matters for Leopold. And the reason these things are moral in character is because both humans and the land (recall the pyramid) are entities that can be harmed or benefited in a particular way. Leopold explains the nature of this harm, saying that the 'almost world-wide display of disorganization in the land seems to be very similar to disease in an animal, except that it never culminates in complete disorganization or death. The land recovers, but at some reduced level of complexity, and with a reduced carrying capacity for people, plants, and animals' (1949, p. 219). (Here again is a nod to the organism model of ecosystems.)

Leopold wants his readers to recognize that many human activities are causing harm to that which was thought incapable of truly being harmed; moreover, damaging the land as a whole negatively affects the other entities that are its constituent members. He is calling, then, for humans to grow a conscience with respect to how their actions affect ecosystems. Leopold writes: 'A land ethic [. . .] reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land' (1949, p. 221). Leopold's point here about conscience reflecting a concern for the *health* of the land is, I think, the touchstone to understanding his land ethic.

But what does it mean for the land to be 'healthy?' In the section that precedes the 'Land Ethic,' a section entitled 'Wilderness,' Leopold explains that the land being healthy implies that it is capable of self-renewal. And specifically regarding organisms, he thinks that health is of primary value to them. He emphasizes that '[t]he most important characteristic of an organism is that capacity for internal self-renewal known as health.' But, because, at times, Leopold thinks an ecosystem is sufficiently like an organism, its health can be seen as being of primary value to it (1949, p. 194).

Leopold defines the very activity of conservation to be humanity's effort at understanding and preserving the land's capacity for health (i.e., its capacity for self-renewal). Again, Leopold is giving clear emphasis here to the idea that the land itself is a kind of organism, further making this historical observation that, '[t]here are two organisms whose processes of self-renewal have been subjected to human interference and control. One of these is man himself (medicine and public health). The other is land (agriculture and conservation)' (1949, p. 194). (Note that the "Wilderness" essay from which this is derived was written by Leopold, according to Curt Meine, *after* "The Land Ethic" essay. The land-as-organism model, then, was still very much operative in Leopold's thinking and his work [Meine, 1988, p. 504].)[6]

Leopold, of course, goes on to lament that some human agricultural and conservation practices have actually made the land sicker (1949, p. 194). So, what becomes clear from his emphasis on the importance of the health of the land, and from the normative language in which such health-talk is couched, is that a land ethic ultimately makes us humans responsible for using our powers in ways that allow the land to renew itself, for it to thrive in terms of its being healthy.

From both Leopold's discussion of the land pyramid and from his premise that it is complexity that keeps self-renewing energy pumping upwards through the pyramid, his readers are indeed left to conclude that it is morally incumbent upon all humans to keep the necessary species alive and healthy, thus maintaining complexity, so that self-renewal of biotic systems is possible. Thus, when Leopold identifies the conceptual cleavages that define how humans may paradoxically view the land, he comes full-circle, once again highlighting our lamentable Odysseus-like action of treating nonhuman nature slavishly. However, he is now in a position to present us with an alternative choice he has heretofore been justifying. The choice is now between: 'land the slave and servant *versus* land the collective organism' (p. 223). What "The Land Ethic" has been arguing makes the moral choice here clear. Consequently, Leopold recommends his renowned land ethic principle to guide human conduct toward the power of the land to renew itself: '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' (1949, pp. 224-225). Leopold, I think it highly reasonable to infer, invokes the notions of integrity, stability, and beauty here as indicators of land health. Preserving such health by respecting the land's integrity, stability and beauty thus signifies that ethical treatment is being visited upon the land.

Now, when Leopold's analogizing of ecosystems to organisms is viewed through the lens of contemporary ecology, it is actually problematic, given important dissimilarities between the two. (The paper's next section sketches J. Baird Callicott's critique of this analogy.) Despite such problematics, what should vividly stand out for readers regarding Leopold's ethical views, given my exposition of his ideas thus far, is this: he intends to use land health as *the* reason moral consideration should be given to

biotic wholes. Leopold, of course, makes interchangeable use of both an organism model and a community model to describe ecosystems. I maintain that Leopold's comfortable use of this interchangeability in models only makes sense for his ethical purposes because both concepts pick out land health as the conceptually adequate feature sufficient to cause, by his thinking, an extension of moral consideration. These entities have a health, and that is why we should care about them. Of course, as with J. Baird Callicott's later work interpreting Leopold's land ethic, one can update Leopold by making exclusive use of the ecosystems-as-communities model, but a faithful interpretation of the land ethic cannot fail to recognize the fundamental importance Leopold places on land health *simpliciter*. And it is a problem for Callicott that his later interpretation fails in just this way. More on this later.

**3. Callicott on Leopold's Ecosystems-as-Organisms Analogy**

Current ecology seriously calls into question the land being organism-like, and J. Baird Callicott, in his essay 'From the Balance of Nature to the Flux of Nature: The Land Ethic in a Time of Change' (Callicott, 2002), attempts to update Leopold's land ethic on this point. Callicott explains that Leopold began working on the manuscript that would become *A Sand County Almanac* in 1942. The science of ecology at this time—as one might expect from the ideas of *A Sand County*—often used an organism model to understand ecosystems. For like organisms, ecosystems were identified as having a physiology—one made-up of the symbiotic functions of their component species) (Callicott, 2002, pp. 92-93); they had an ontogeny (i.e., developmental stages); and they processed energy (i.e., ecosystems were identified as having metabolisms, which 'were in a long-evolved condition of dynamic equilibrium') (2002, p. 93).

Contemporary ecology, however, repudiates the notion that ecosystems are organisms. For example, species interactions—it is now thought—ought to be characterized chiefly as negative rather than positive. As Michael Soulé (a pioneer in conservation biology) puts it, '[m]ost interactions between individuals and species are *selfish*, not symbiotic.' Soulé explains further that these selfish interactions involve 'competition, predation, parasitism, and disease' (Soulé qtd. in Callicott, 2002, p. 143)[7] So, unlike the frequent symbiotic behavior of cells that makes up the physiology of multi-celled organisms, the mostly negative interactions of species making-up an ecosystem do not give rise to an analogous physiology. Ecosystems, it turns out, are significantly different from organisms in this important respect.

A related point has to do with the idea that ecosystems undergo developmental stages leading to a dynamic equilibrium. The competition, predation, parasitism, and disease that are prevalent within ecosystems do not give rise to homeostasis. Soulé explains that the principle of balance that once was thought to be characteristic of ecosystems 'has now been replaced with the principle of gradation—a continuum of degrees of …disturbance' (Soulé qtd. in Callicott, 2002, p. 95). Callicott himself seizes upon this last point regarding change, ominously warning that things seemingly get even worse for 'The Land Ethic' when considering the scale of natural change. Callicott explains that '[i]n the 1970s and 1980s, ecologists began to discover that a disturbance or "perturbation" was ecologically "incorporated" and normal, not…abnormal. Disturbance—by wind, flood, fire, pestilence—not freedom from such disruption, is part of nature's normal state' (Callicott, 2002, p. 95).

Callicott, acting as devil's advocate, then asks whether in light of the normality of these disturbances, humans really ought to fret over their harming nature. Indeed, Callicott further queries: 'Is it even meaningful to talk about the integrity, stability, and beauty of levels of biological organization whose existence is doubtful? And what can we appropriately *preserve* if nature is directionlessly dynamic' (2002, p.96)?

In responding to the above concerns, Callicott first takes aim at the notion that organisms are robustly independent of one another. He thinks that clearly this is not the case. At the very least, it must be acknowledged that amongst organisms, 'consumers cannot exist without producers and producers cannot exist without decomposers' (2002, p. 96). In our world, that is, a basic fact about organic life is the existence of interdependent roles. Interdependency, then, is an inescapable feature of life on our planet. And although these interdependencies may not be sufficient to justify analogizing ecosystems to organisms, they do exist. Thus, the lines of dependencies Leopold identifies as running up and down the land pyramid are something that contemporary ecology does not deny, but actually affirms.

Callicott next cites R.P. McIntosh (a follower of H. A. Gleason—the originator of the individualistic concept amongst plant communities) to clear up the idea that not even the individualistic, neo-Gleasonians think nature totally devoid of ecological order. McIntosh explains:

> The implication of anarchy, or lack of any order, is a common misrepresentation of Gleason's individualistic concept, which some have erroneously said is a random assemblage of species lacking any relations among the species…It is doubtful…that any ecologist envisioned a community as a merely chance

> aggregation of organisms and environment lacking discernible pattern (McIntosh qtd. in Callicott, 2002, p. 97).[8]

Callicott next sets about arguing that both the mutualisms found between organisms in an ecosystem and the stability of those ecosystems are sufficiently analogous to the dynamics of a human community that using the community metaphor to describe an ecosystem is apt. That is, he explains that just as human communities are made up of sometimes selfish and competitive persons whose activities make their respective communities 'neither stable nor typological,' those communities are still seen as real, and they prompt moral consideration being granted to both community members and to the community itself. By analogy, then, ecosystems—which evidence similar dynamics—can be seen as existing entities capable of engendering moral considerability for both their constituent members and themselves (2002, pp. 97-99).

Accordingly, to update Leopold's ideas, Callicott wants to replace entirely the ecosystem-as-organism model with an ecosystem-as-community one. The interdependencies amongst ecosystem members, he thinks, are sufficient connectors to allow the identification of a whole, and that whole—it turns out—looks a lot like a community. But, again, since communities are given moral consideration, so too should ecosystems. (I say more below about how Callicott comes to this conclusion.) Callicott, however, is not quite done. The aforementioned findings of contemporary ecology call into question just how Leopold's land ethic would have us act.

Leopold's land ethic principle advises us 'to preserve the integrity, stability, and beauty of the biotic community' (Leopold, 1949: 224-225). But the very notion of preserving integrity and stability (Callicott does not address beauty here) connotes more

of a stasis to nature than there really is. Callicott explains that it is as if Leopold wants us to be morally obliged to arrest change in something that is naturally dynamic. Of course, Leopold recommends this, as Callicott explains, because Leopold 'was under the sway of midcentury equilibrium ecology, [and] he conceived of natural change primarily in evolutionary, not in ecological terms.' Yet in defense of Leopold's ideas, it can be acknowledged that even the more dynamic types of change that ecosystems undergo still have normal temporal and spatial boundaries (i.e., there is an appropriate scale to the changes naturally dynamic ecosystems undergo.). Callicott thinks that it is this notion of appropriate scale that Leopoldians should install to undergird their arguments (Callicott, 2002, p. 100).

Invoking a revised version of a Leopoldian land ethic based on Callicott's recommendations could allow, then, persons to indict certain kinds of questionable human practices. For example, consider those human practices that contribute to mass extinctions. One reason that these extinctions can be seen as wrong—from a land-ethical perspective—is not because of the intrinsic badness of extinction. (Extinction is completely natural and, one might argue, possibly conducive to ecosystemic health in certain circumstances; the thought of human extinction uncomfortably comes to mind here.) Mass extinction is instead morally bad, argues Callicott, because his revised Leopoldian perspective bemoans its abnormal rate. Similarly, global warming can reasonably be thought morally bad, Callicott thinks, because of broad and swift systemic disturbance resulting from humans raising temperatures at an unprecedented pace (2002, p. 102).

Those accepting of Callicott's updating of Leopold must ultimately accept the moral disvalue of undermining communities as the reason for why large-scale changes should themselves be seen as morally bad. Such rapid change has a character that does not sit well with those possessing an understanding of ecology. And it does not sit well with them because they understand that they, as humans, have both an evolutionary kinship with nature and that they, along with the non-human constituents of nature, make up a biotic community. Callicott writes: '[B]ecause *Homo sapiens* is a moral species capable of ethical deliberation and conscientious choice, and evolutionary kinship and biotic community membership add a land ethic to our familiar social ethics, anthropogenic changes may be land-ethically evaluated. But by what norm? The norm of appropriate scale' (2002, pp. 101-102).

Given J. Baird Callicott's body of philosophical work, the moves he is making here fit within a larger context. Callicott's later work on Leopold's land ethic seeks to situate a Leopoldian ethic within a neo-Humean framework such that the wrongfulness of any human action stems from that action's running afoul of human sympathies. Callicott has elsewhere argued that Leopold was sufficiently influenced by the idea, made popular by eighteenth century philosopher David Hume, that morality ultimately rests upon the sentiments or the emotions of humans; such influence, Callicott claims, came via Leopold's direct reading of Darwin, who himself was influenced by the moral sense theorists, including Hume (Callicott, 1987). So, it is no surprise that within Callicott's written piece updating a background ecology for Leopold's land ethic that he briefly cites notions of human evolutionary kinship and human biotic community membership as

conceptually adequate emotion pumps for indicting inappropriately scaled environmental change.

Human communities and biotic communities, which were forged within the crucible of a shared evolutionary history, are what have basic moral value for Leopold, argues Callicott. Thus, when humans recognize various communities of which they are members, this recognition sufficiently tickles our sentiments such that direct moral considerability for those communities results. Callicott qualifies this point by saying that humans will often and quite rightly have a tendency to privilege those communities to which we are most evolutionarily related before others more genetically distant (Callicott, 1987, p. 208).

The curious thing about Callicott's subjectivist line, though, is that it is ultimately the brute evocation of negative feelings that makes some action wrong and not the occurrent harm resulting from the action. This idea, however, is not in keeping with Leopold's *A Sand County Almanac*. As I tried to show previously in my description of his land ethic and its focus on health, Leopold instead suggests that there are immoral ways of treating nature. And the immoral nature of this treatment—undermining health—is demonstrably independent of how people feel about the matter.

This is not to suggest that Leopold sees no place for appropriate emotions; remember, Leopold does say that an object of moral concern must be 'something we can see, feel, understand, love, or otherwise have faith in' (1949, p. 214). But Leopold is clearly including more than emotive concepts here. After all, Leopold's status as a conservation biologist put him in a unique position to discuss, from a scientific

perspective, the broad effects human behavior has on nature—a nature we can see, feel, understand, have faith in, and, yes, love.

Consequently, it is reasonable to infer from what Leopold writes in *A Sand County Almanac* that Leopold takes the capacity for non-human nature to thrive (i.e., to maintain an organic health) as something that is objectively deserving of moral respect. This is contrary to Callicott's take. Again, Leopold wrote: 'An ethic, ecologically, is a limitation on freedom of action in the struggle for existence.' Ethics are a means to existence; they are, as Leopold put it, symbioses (1949, p. 202). These kinds of symbioses endure even if the mutualisms found in ecosystems *qua* ecosystems are better understood in a communal sense rather than an organismic one (i.e., even if Leopold's background ecology is updated along the lines for which Callicott argued). Leopold's grasp of ethics, then, far from being ultimately subjective, evidences more of a definitive, objective content: it represents the need for moral respect being given to those entities capable of thriving, of having a health.

This understanding of Leopold makes sense of Leopold biographer Curt Meine's observation regarding Leopold's characterization of conservation. Marbling in direct quotations from Leopold, Meine writes: 'Leopold predicted that, once we have learned more of "the language" of the natural world, we will know that "there is…drama in every bush," and "when enough men know this, we need fear no indifference to the welfare of bushes, or birds, or soils, or trees. We shall then have no need of the word conservation, for we shall have the thing itself"' (Meine, 1988, p. 38).

Leopold's metaphor/analogy about the natural world being readable like a 'language' and the further understanding that this language leads to the conclusion that its

constituents have a welfare in need of respect leaves little room for an ethic fundamentally based on evolutionary-fueled, communal-oriented sentiments. Rather, Leopold suggests that science allows us to understand this language to nature, and it can be read-off and understood in enough detail that it gives good reasons to marginalize indifference to the welfare of that which is in possession of a health. Recall also that Leopold counts soils and waters amongst that which is in possession of a health. Biologists themselves, of course, do not hesitate in continuing to affix such labels on soils and waters. Were our ethics, as Callicott understands them, inescapably evolutionarily tinged along the lines he is arguing, then granting serious moral consideration to soils and to waters, as Leopold would have us, is problematic, as we are not genetic kin with them.

Leopold therefore emphasizes the relevance of descriptive truths about organisms' health—and even the health of soils and waters—as grounding the land ethic and the actual symbiotic practice of humans conserving value in ecosystems, not human sentiments tethered to notions of community. Leopold does this when referring to land health directly and he does it when referring to the very nature of conservation, which has land health as its penultimate concern.

One of Callicott's major mistakes in interpreting Leopold, then, can be summed-up as follows: It is not that Leopold would have us morally concern ourselves with the idea of land health, because it is possessed by that which is a community to which we are evolutionarily related, rather Leopold would have us concern ourselves with a land community because it has a health. Again, this is why, for his purposes in *A Sand County Almanac*, Leopold is fine with interchangeably using the differing analogies of the-land-as-an-organism and the-land-as-community. He can do so because both concepts pick

out what is of the utmost moral importance to him. While Leopold may have found himself in-between changing models of ecosystems, as Callicott maintains, what was fundamentally morally important about ecosystems is expressible by both models: health.

Interestingly, Callicott's own understanding of Leopold's use of these differing analogies has seemingly changed over time. Consider Callicott's early interpretation of Leopold found in his piece, 'Animal Liberation: A Triangular Affair.' Callicott's earlier take highlights instances wherein Leopold alternatively, albeit 'less consistently,' characterizes the land as an organism as well as a community (1989, p. 23). Callicott makes this observation matter-of-factly, fighting no associated exegetic battles, as doing so presumably served no theoretical need for him at the time. When confronting Leopold's ideas here early on, Callicott thinks that Leopold's representation of the land as either a community or as a super-organism is adequate to stir feelings of ethical conscience. Moreover, Callicott's earlier take on Leopold actually invokes the work of Plato rather than Hume to make moral-theoretic sense of 'The Land Ethic,' so excluding the organism analogy was unnecessary by his lights.

Callicott turns to Plato's idea that, 'body, soul, and society have similar structures and corresponding virtues. The goodness of each is a function of its structure or organization and the relative value of its parts or contribution made to the integrity, stability, and beauty of each whole' (Callicott, 1989, p. 28). Thus, Plato—in the interest of those wholes represented by body, soul, or community—thinks it appropriate to sometimes sacrifice their constituent parts in order to preserve the various virtues of these wholes. Similarly, Callicott maintains that the holism of the land ethic may require sacrificing, for example, the desires, interests, and even the lives of some humans and

other animals to preserve the biotic community's virtues—its integrity, its stability, and its beauty (Callicott, 1989, pp. 28-29).

Callicott's later interpretation of Leopold's land ethic, namely, that which is found in his 'Conceptual Foundations of the Land Ethic,' instead seeks to limit Leopold's considered view to the aforementioned Eltonian, ecosystem-as-community analogy. It is here that Callicott maintains the organism model to be only 'vestigially present.' Callicott argues that Leopold probably saw the community analogy as more apt (despite leaving in the organism one, too, and despite his use of it in the later-written essay, 'Wilderness'), because Leopold recognized the organism view as marginal amongst ecologists. Moreover, Callicott thinks the community view is a better fit for the Darwinian/Humean framework in which he became convinced Leopold situates his ideas (Callicott, 1987, pp. 194-202).

Callicott's later reading raises the question as to why Leopold wrote in such a way that he thought his arguments to work using either analogy. Ecology may have been changing models, but Leopold felt free to use either and did so. Why? Again, I submit that my thesis—that Leopold morally centers his ethical ideas fundamentally around health rather than communal-oriented sentiments—answers this question far better than Callicott's later understanding of Leopold. Upon critical analysis, Callicott's likening of the ecosystem-as-organism model to a vestigial organ seems more of a rhetorical move, one seemingly revelatory of a need to explain away something ill-fitting for his later interpretation, rather than something illuminating of Leopold's own thinking.

Leopold arguing health to be of fundamental ethical value within biotic wholes has another positive implication: the direct moral considerability of individual organisms

is given support by the logic of his arguments. No doubt that Leopold's primary emphasis in writing about a land ethic focuses on groups of entities and what emerges from their interactions: ecosystems and the biosphere as a whole. This is clear, for example, from the wording of his culminating land ethic principle. Yet this very same principle is itself supported by arguments, I endeavored to show, that put front and center the moral value of health. And clearly individual organisms are in possession of their own unique health; they singularly thrive in themselves in ways.

This thought raises a further question of whether Leopold's writings ever highlight the value of individual non-human organisms and their respective thrivings. Indeed, there are such instances. Moreover, taken in their totality, they further cut against Callicott's idea that Leopold grounds moral considerability in community membership (i.e., individuals are morally considerable if and only if they are part of a community). The following examples, derived from *A Sand County Almanac*, continue making sense of why it is likely Leopold kept the ecosystem-as-organism analogy operative. They show Leopold ascribing what can only be thought of as moral value to organisms because of their possessing a life and a health.[9]

**4. Leopold's Moral Respect for Individual Nonhuman Organisms**

That one is not free to harm another living being without some good reason is intuitively appealing, and it is actually in keeping with the way Leopold writes about individual nonhuman organisms. The logic for this is present within the 'Land Ethic' essay, and one gets strong hints of it in many of the other essays in *A Sand County Almanac*. One of the first instances where the reader discovers Leopold demonstrating

his appreciation of an individual organism and its ability to thrive comes in his description of a fallen oak, an oak that burns in his fireplace as he writes (1949, pp. 6-7).

Leopold's depiction of the probable birth, growth, demise, and subsequent sawing of the tree serves as the backdrop for his re-telling of other events, primarily ecological ones, contemporary to the tree's own eighty-year history. Regarding the oak itself, Leopold explains that its odds of having matured from an acorn to a sapling—one tough enough to fend-off hungry rabbits—were one in a thousand. After citing the odds, Leopold expresses his appreciation that his particular oak beat those odds, soaking up 'eighty years of June sun' (1949, p. 7). Thus, Leopold's readers get a glimpse, very early on, that theirs is an author who values wildlife's ability to thrive, not just as part of a biotic community, but individually. Leopold very much celebrates the life and health this oak possessed.

In another section of *A Sand County Almanac*, Leopold laments the impending loss of the last silphium plant observable along a particular stretch of Wisconsin highway. It is a bit of poetic irony that this plant and its big yellow flowers found refuge behind the fence of a country graveyard. The highway department's recent removal of the fence, however, now subjected that plant to a mower's blade, undermining it health and ultimately ensuring its demise. When that silphium plant is gone—a specimen Leopold endearingly calls 'my Silphium'—the result is a loss in a bit of prairie history. In fact, despite their being remaining silphium elsewhere, even in the same county, this plant's death is a token of the type that has Leopold calling into question the progress we humans make via our mechanizations and the uses to which we put them (1949, pp. 44-46). As with the oak tree example above, at the core of what Leopold is arguing is the valuing of

a single life that possesses something that, when gone, should cause us humans to question our values and behavior. This is the case even when other important related points are taken into account, points such as not diminishing a living, natural history or questioning how we humans should truly measure progress. These points themselves orbit what appears to be the moral significance of a thriving entity, the life of which Leopold does not want to see extinguished. Leopold regrets that a mower is undermining this Silphium plant's health. He regrets that it will soon be lost.

Perhaps Leopold's comments about the plant draba best evidence his appreciation for an organism being able to thrive. Although he writes of draba as a species, the points he makes very much concern the value individual members instantiate. Draba, Leopold explains, 'is the smallest flower that blows,' meaning it allows the wind to carry-off its tiny blooms to sprinkle the ground, including on seemingly inhospitable sandy spots. Draba, in fact, does quite well taking root in sandy ground, and it grows, Leopold further informs his reader, where there is not enough sun for larger plants. Continuing his description, Leopold writes:

> Draba plucks no heartstrings. Its perfume, if there is any, is lost in the gusty winds. Its color is plain white. Its leaves wear a sensible wooly coat. Nothing eats it; it is too small. No poets sing of it. Some botanist once gave it a Latin name, and then forgot it. Altogether it is of no importance—just a small creature that does a small job quickly and well (Leopold, p. 26).

Leopold's account of draba leaves the reader with the impression that there is not much to the little flower. Inventorying his description, we know that draba is nothing to look at; its fragrance is insignificant; and aside from Leopold's mentioning that it is not

an important food source, its relationship to the surrounding sandy environment isn't noteworthy. Yet, he bothers to write about it. Why? If the theme of *A Sand County Almanac* gives any indication, it is because Leopold wants to sensitize his readers to the variety of morally significant things heretofore ignored—and the oft-ignored draba appears to be one of those things. Leopold's description of draba, however, leaves one with the sense that the value he is punctuating must lie in the job it does so 'quickly and well,' the difficult job, that is, of growing in otherwise infertile ground.[10] As Leopold remarks, draba is a living thing 'that plucks no heart strings' and whose contributions to its ecosystem are of little note. But there is value there, despite its uninspiring appeal to sentiment and despite its contributory shortcomings to its surroundings. Leopold celebrates that the little flower is able to have a healthy existence amongst the sands where other things cannot grow.

The above examples put intellectual pressure to go beyond holism for anyone seeking to formulate a thoroughly Leopoldian land ethic, an endeavor that is regrettably beyond the scope of this essay, and to which I must return to at another time. The present point is that Leopold's ideas would preclude treating individual organisms arbitrarily, for reasons not having to do with their biotic community membership. Certainly this does not mean that legitimate sacrifices of such organisms cannot be made. Leopold, for example, explicitly wrote of himself as a comfortable hunter, mindful though he was of what he took from the land and for what reason(s) he did so.[11] The upshot is that some reasonable justification is necessary for such sacrifices. When ethically dealing with living things from a Leopoldian perspective, some moral consideration must always be given and some moral significance assigned.

## 5. Conclusion

My paper here first argued that Aldo Leopold's work in *A Sand County Almanac*, especially what is found in his 'Land Ethic' essay, justifies treating non-human nature morally, because moral agents can harm or benefit its constituent members. Leopold is quite clear in his 'Land Ethic' essay that it is the *health* of biotic wholes that should be of moral import to us, or what I have synonymously labeled as life's ability to thrive. This valuing is why Leopold feels free to analogize ecosystems both to an individual organism and to a community, as either can be made healthy or unhealthy, both can thrive.

It was further argued that even if J. Baird Callicott is well-justified in jettisoning the organism analogy for biotic wholes, due to its science-based, explanatory deficiencies (something, I believe, the science does back him up on), Callicott can only do so and remain faithful to the logic of Leopold's arguments if he were to ground nature's moral considerability in its capacity to thrive, in its ability to be healthy. Instead, he shoehorns Leopold's land ethic into a Darwinian-Humean, moral sense account, which has it that sentiments evoked by community membership are responsible for bestowing moral considerability.

Lastly, my interpretation of Leopold has positive implications for the moral status of individual organisms. Grounding Leopold's land ethic in the value of health supports the idea that individual organisms qualify for moral treatment in and of themselves, for they are also in possession of their own unique health. Moreover, there are examples of Leopold highlighting such significance when he writes about the value of individual organisms.[12]

Again, it requires further work to take these interpretive elements and to include them in a fully worked-out, Leopoldian land ethic. This new Leopoldian ethic needs to include a theory of value that specifies any other moral goods Leopold thinks to be possessed by humans and non-humans (e.g., wildness might be a candidate for the latter [see 1949, pp. 188-201] and moral agency/virtue for the former [see 1949, p. 110]).[13] To sort out the moral conflict that arises with actually respecting these values, it would also need to articulate a decision procedure that can reasonably guide moral conduct. Undoubtedly Leopold's land ethic principle would need to be a part of that. An environmental ethic with these elements is likely to be very unique by comparison to other competing ethics laying claim to being Leopoldian. At the very least, it will stand in strong contrast to J. Baird Callicott's now classic interpretations of "The Land Ethic."

Scientifically, this ethic would need updating to include reasonable accounts of health, both for individuals and for groups (and for things like soils and rivers). Philosophically, there needs to be a moral-theoretic explanation of why being in possession of a health qualifies an entity as morally considerable (the debate over the moral value of conation might be especially informative for this project). What will then emerge is a fully worked-out Leopoldian land ethic whose reasonableness is testable. Any shortcomings can then be understood and the theory modified accordingly, if possible.

After all, what we as environmental thinkers are wanting is a reasonable guide to moral conduct as it pertains to the environment and its constituents; furthermore, most of us want such an ethic to affect people's actual behavior, up to and including actual policy. And a correct understanding of Leopold's work is important even here.[14]

Leopold's ideas, however, must stand and fall with all others offered up. For as truly great in thought and deed as Leopold was, hero worship should not blind us to any deficiencies once his ideas are systematized.

What Aldo Leopold is more than deserving of, though, is the most accurate portrayal of his ideas. This was the overarching goal of my paper here. It is, however, both a testament to the intuitive attractiveness of Leopold's ideas and to its prima facie claim to some measure of reasonableness that thinkers are still arguing over exactly how Leopold should be understood some sixty-five years after *A Sand County Almanac* first began to inspire us.

**Notes**

[1] I leave open the likelihood that, for Leopold, additional morally significant qualities are possessed by some of these very same constituents of nature.

[2] Leopold's use of the term 'symbiosis' connotes a positive relationship between the symbiont organisms. When biologists today, however, use the term 'symbiosis,' they may use it to denote both positive and negative relationships between organisms. Symbiotic relationships, then, include: mutualism (a mutually beneficial relationship), parasitism (a relationship where one organism receives either no benefit or is injured while supplying a benefit to another), and commensalism (an association between two organisms that is harmless to both but where one benefits) (Hogan, 2014). The type of relationship that mutualism picks out seems to be the one that Leopold is getting at when he speaks of 'advanced symbioses' or 'cooperative mechanisms with an ethical content' (e.g., politics and economics) (Leopold 1949, p. 202).

[3] These days we would add hydrothermal vents as supplying energy for some deep sea organisms. The overall point Leopold makes about biotic interdependencies with his metaphorical land pyramid, however, remains unscathed by this qualification.

[4] There appears to be a problem with Leopold putting humans in the omnivorous middle of the pyramid and then claiming that '[e]ach successive layer depends on those below it for food and often for other services' (1949, p. 215). Humans do not serve regularly as food for the larger carnivores that conceptually sit above them atop the pyramid. Indeed, the things for which humans do serve as food (e.g., as they decay) rest at the bottom of the pyramid. Of course, Leopold recognizes this last point. He writes,

for example: ‘Food chains are the living channels which conduct energy upward; death and decay return it to the soil’ (p. 216). Regardless, Leopold’s overall point about the existence of a biotic mechanism made-up of interdependent parts and responsible for energy transfer can still be both conceptualized and discussed.

[5] The “Land Ethic” is replete with references to complex dynamics that also seem very complementary to the organism model of ecosystems. For example, there are references to the land being a ‘biotic mechanism’ (p. 205, 214),’ as possessing circuitry (p. 216, 217, 218), as being an ‘energy unit’ (p. 216) and as functioning like a clock (p. 214).

[6] Another point of interest here besides Leopold treating the land as an organism is his mentioning of public health, which deals with aggregates of humans as a community and their collective health concerns. Leopold is putting forward the idea, then, that communities *qua* communities, not just individuals, have a health, a point he certainly extends to biotic wholes understood as communities.

[7] The original citation is: Soulé, M. (1995) The social siege of nature. In M.E. Soulé and G. Lease (Eds.) *Reinventing Nature? Responses to Postmodern Deconstruction,* ed. (Washington D.C.: Island) 137-170.

[8] The original citation is: McIntosh, R.P. (1998) The myth of community as organism, *Perspectives in Biology and Medicine*, 41, 431, 433.

[9] After reading *A Sand County Almanac* in its entirety, one can reasonably see the following subtext, given that which precedes the ‘Land Ethic’ essay: If an individual organism with a health is morally considerable, then collections of these organisms

making up an ecosystem with its own organism like health would *a fortiori* be morally considerable, too.

[10] As for an example that concerns non-human animals, one comes when Leopold writes about the geese visiting his sand farm each spring. Occasionally, Leopold observes a goose that appears a bit too noisy and that seems a bit too anxious in its flight. Initially, he thought it a subjective bias for him to attribute, behaviorally, the searching for, and mourning of, a mate lost to hunting. However, subsequent observations Leopold and his students made for a half-dozen years found that flocks of geese statistically consist in groups of six or multiples of six. This makes it likely that normal groupings really are families or collections of families (Leopold, 1949, p. 18-22). Realizing that it was probable that certain noisy, erratic geese were widowers, Leopold writes that he is "free to grieve with and for the lone honkers" (p. 22). In this example, there are the added elements of sentiency and suffering that certainly inform what it means for certain entities to thrive. But the fundamental fact of health remains, and it is likely that the elements of sentiency and suffering add to what it means to be for some organisms to be healthy, thus health here for Leopold will *a fortiori* be of ethical significance.

[11] See, for example, Leopold's musings about the sky dance of the woodcock and his hunting of them (1949, pp. 30-34).

[12] For those dedicated to the philosophical project of finding an intuitively attractive but reasonable, Leopoldian-inspired environmental ethic, this way of generating moral considerability for individuals has an advantage over how J. Baird Callicott's later work grounds such value. Value for individuals, under his scheme, is subject to community member status that is given a positive polarity by human sentiment.

However, a plausible reversal of such polarity is realizable in the face of virtually nonexistent ecosystemic contributions by a species-member, say, because it is on the verge of extinction. Or perhaps ecosystemic contributions are overdetermined by the abundance of an organism. Given either, perceptions of community membership and their attending feelings might fade to nothing. If, however, the moral significance of an individual organism is justified by its ability to thrive, given its possessing a health, this particular concern dissolves.

[13] The kind of moral pluralism that I am alluding to here is based on multiple intrinsic values rather than the pragmatic pluralism recently under contention between Bryan Norton, an advocate of Leopold embracing such pragmatism, and Callicott, who sees Leopold eschewing pragmatism. For a sampling of this debate see Callicott, Grove-Fanning, Rowland, Baskind, French & Walker. (2009) Was Aldo Leopold a pragmatist? Rescuing Leopold from the imagination of Bryan Norton, *Environmental Values*, 18, pp. 453–486. Also Norton, B.G. (2011) What Leopold learned from Darwin and Hadley: comment on Callicott et al., *Environmental Values*, 20, pp. 7-16.

[14] A correct understanding of Leopold for policymakers is not something that should be taken for granted. Consider a curious example of Leopold's influence on former Secretary of the Interior, Gale Norton. She counts Leopold as having had a major influence on her views. Speaking to the Sand County Foundation in 2002, she says: 'As a college student, I read Leopold's work. It helped shape my philosophy about the role of individuals in caring for our lands.' Additionally, she reported that the 'new environmentalism' being touted by her Department of the Interior—a bottom-up, market-based approach to environmental problems—depends on the kind of harmony between

men and land lauded by Leopold. Indeed, she thinks this new environmentalism also 'captures [Leopold's] vision of a nation of citizen-conservationists' (Remarks Prepared, 2002). It is an odd thing that Secretary Norton counts Leopold as such an influence. Roughly four months after delivering her speech to the Sand County Foundation, a federal judge was threatening to hold her in 'contempt of court' for shunning a court order to set aside sanctuaries protecting endangered Florida manatees from boaters. It is arguable that someone sufficiently influenced by Leopold's land ethic would not act as Norton did (Judge Orders, 2002).

**References**

Callicott, J. B. (1987) The conceptual foundations of the land ethic. In J. B. Callicott (Ed.) *Companion to A Sand County Almanac: Interpretive & Critical Essays*, pp. 186-217 (Madison: Wisconsin UP).

Callicott, J. B. (1989) Animal liberation: a triangular affair. In J. B. Callicott (Ed.) *In Defense of the Land Ethic*, pp. 15-38 (Albany: SUNY Press).

Callicott, J. B. (2002) From the balance of nature to the flux of nature: the land ethic in a time of change. In R. L. Knight & S. Riedel (Eds.) *Aldo Leopold and the Ecological Conscience*, pp. 90-105 (New York: Oxford UP).

Callicott, Grove-Fanning, Rowland, Baskind, French, & Walker (2009) Was Aldo Leopold a pragmatist? Rescuing Leopold from the imagination of Bryan Norton. *Environmental Values*, 18, pp. 453–486.

Hogan, C.M. (2014) "Symbiosis." In *The Encyclopedia of Earth*. 12 Aug, 2014. Available at http://www.eoearth.org/view/article/51cbeefe7896bb431f69baf8 (accessed 12 Aug. 2014).

Judge Orders 14 new manatee refuges, *Environmental News Service*, August 1, 2002. Archived and available at http://www.freerepublic.com/focus/f-news/729159/posts

Leopold, A. (1949) *A Sand County Almanac and Sketches Here and There* (New York: Oxford UP).

McIntosh, R.P. (1998) The myth of community as organism, *Perspectives in Biology and Medicine*, 41, 431, 433.

Meine, C. (1988) *Aldo Leopold: His Life and Work* (Madison: The University of Wisconsin Press)

Norton, B.G. (2011) What Leopold learned from Darwin and Hadley: comment on Callicott et al., *Environmental Values*, 20, pp. 7-16.

Remarks prepared for delivery by The Honorable Gale Norton, Secretary of the Interior, Sand County Foundation, April 18, 2002, Speech. *U.S. Department of the Interior Website*. Archived and available at: http://web.archive.org/web/20020602014402/http://www.doi.gov/news/020424.html

Soulé, M. (1995) The social siege of nature. In M.E. Soulé and G. Lease (Eds.) *Reinventing Nature? Responses to Postmodern Deconstruction,* ed. (Washington D.C.: Island) 137-170.