Commentary

Reconciling Wildlife Management's Conflicted Purpose With a Land Community Worldview

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ABSTRACT To reach its potential wildlife management needs a coherent purpose. Traditional divisions between science, society, and nature, however, create conflicts between responsibility to science, the public, and nature. These divisions emerged as early as Plato's (400 BC) allegory of the cave. In Plato's allegory human society existed inside a cave formed by its own delusions, and a philosopher or scientist could leave the cave and apprehend reality in nature. Wildlife management's simultaneous responsibility to public preferences, objective truth, and biotic integrity provides the foundation for a conservation worldview capable of transcending the divisions embodied in Plato's allegory. In this paper we deconstruct the conflicted worldview standing on that foundation and describe a land community–based worldview for wildlife management that could replace it. The transition from traditional views of science, society, and nature to a land community worldview requires 1) changing scientific stewardship from seeking objective truth to seeking credible truth, 2) changing political stewardship from following societal dictates to representing wildlife within the land community, and 3) changing ethical stewardship from protecting biotic integrity to fighting permanent closure of land community boundaries. Adopting a land community worldview for wildlife management requires relinquishing the illusion of absolute objectivity and a fall from status as neutral arbiters of knowledge but provides a means for honorably seeking reliable knowledge, serving the public and respecting the land community. (JOURNAL OF WILDLIFE MANAGEMENT 71(8):2499–2506; 2007)

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To continually improve its effectiveness, the enterprise of wildlife management should continually review and define a coherent purpose. Professionals in practical disciplines must address one critical question: what should we do (Ravetz 1971, Norton 1988*b*)? As a practical discipline wildlife management is conceived in terms of socio-symbolic entities (e.g., wildlife), and its guiding purposes determine immediate goals (i.e., achieving a specific impact; Riley et al. 2002). When tools, techniques, or specific goals replace guiding purposes, practical disciplines lose social and scientific utility (Ravetz 1971, Guthery et al. 2001, Riley et al. 2003). The demise of operations research (OR; the formal discipline based on using mathematical models to aid in decision making) demonstrates the fate of practical disciplines that neglect their guiding purposes in the pursuit of solutions for technical and methodological problems (Ackoff 2001). Recent scholarship suggests wildlife management has demonstrated a proclivity for the same technical obsessions that led to OR's downfall (e.g., null hypothesis testing, multi-model inference, Geographic Information Systems; Cherry 1998; Johnson 1999; Anderson et al. 2000; Guthery et al. 2001, 2005). These technical fetishes (Herman 2002), however, may reflect not having a clear path more than mindlessly following the path of least resistance, as some critics have suggested.

When wildlife professionals engage in management activities (e.g., research, habitat or population manipulation, publication), they face multiple conflicting guiding purposes defined by stewardship to science, the public, and ethics. Although stewardship can simply mean caring for nature, the concept refers to management with regard to the desires of beneficiaries (e.g., hunters, fishers, birdwatchers, taxpayers) in the North American model of wildlife conservation (Decker et al. 1996, Geist et al. 2001). Such public stewardship renders wildlife science degrees awarded to students "union cards that permit them to work as biological mechanics in the service of social preferences" (Norton 1988*a*:237). This version of public stewardship reflects the fundamental role of wildlife professionals working for beneficiaries ranging from Kublai Khan and the Israelites (Leopold 1933) to modern sportspeople, bird watchers, and outdoor enthusiasts in the United States (Decker et al. 1996).

Scientifically, wildlife managers are beholden to objective truth (fixed truths independent of social perceptions) instead of public preferences. Responsible scientists must only be held accountable to truth because any other responsibility prevents them from operating within the "culture of no culture" outside the biasing influence of social perceptions (Traweek 1988:162). Ethically, many wildlife managers consider themselves accountable to yet another socio-symbolic entity, the biotic community (Leopold 1949). The land ethic states: "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 1949:224–225). Conflicting versions of stewardship, science, and ethics require wildlife managers to juggle responsibility

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to public preferences, objective truth, and biotic integrity, respectively.

The Wildlife Society code of ethics allows for divisions between stewardship, science, and ethics with its second and third pledges: "recognize research and scientific management of wildlife and their environments as primary goals" and "disseminate information to promote understanding of, and appreciation for, values of wildlife and their habitats" (The Wildlife Society 2006:1). Wildlife management curricula demonstrate the implied division between scientific management and creating values for wildlife. Scientific management dominates most courses, but freshman in Introduction to Wildlife and Fisheries courses are likely to face a professor wielding the *Sand County Almanac* and saying, "this is the closest thing there is to a *Bible* for wildlifers." This natural theology (worldview of ultimate truth and its associated moral codes rooted in ordinary experience), taught in virtually every major institution with a wildlife science program, emphasizes human–nonhuman relationships (the land community) and inculcates students with a moral code (the land ethic). Wildlife management is not alone in hoping conversion to the land ethic will persuade the public to protect the land community. Environmental ethicists, and most environmental activist groups informed by their literature, have attempted to promote expansion of the land community by preaching various permutations of Leopold's mantra (Naess 1973; Callicott 1980, 1989).

How can wildlife management seek the highest standards in the profession (fourth objective of The Wildlife Society) when following public preferences, seeking objective truth, and promoting biotic integrity conflict with each other? Responsibility to public preferences and biotic integrity sets up the discipline for conflicting purposes every time society chooses to harm the environment (e.g., when socially expressed purposes [making money] dictate proximate goals of drilling for oil in the Arctic National Wildlife Refuge or weakening environmental laws). Finally, the scientific duty to objective truth (Romesburg 1981) makes stewardship to the public or ethical ideals an unacceptable bias on inquiry. These conflicts challenge us to develop a worldview reconciling philosophical divisions between science, society, and nature. Otherwise, we may look back on the legacy of wildlife management and offer up the Eichmann-esque response: my official self condoned destruction of biotic integrity while my private self abhorred it (Arendt 1994). Wildlife management's simultaneous responsibility to public preferences, objective truth, and biotic integrity provides fertile ground for a direly needed conservation worldview capable of transcending divisions between science, society, and nature. In this essay we 1) deconstruct the divisions between science, society, and nature that create incongruent responsibilities to objective truth, public preferences, and biotic integrity; and 2) describe a land community worldview rooted in pragmatism and a political conception of the land community that integrates science, society, and nature. The land community worldview changes scientific stewardship from seeking objective truth to seeking credible truth, changes political stewardship from following societal dictates to representing wildlife within the land community, and changes ethical stewardship from protecting biotic integrity to fighting permanent closure of land community boundaries.

DECONSTRUCTING DIVISIONS BETWEEN SCIENCE, SOCIETY, AND NATURE

According to Aldo Leopold (1949:204), realizing the land ethic—integration of human society and nature into one community, the land community—requires changing "the role of *Homo sapiens* from conqueror of the land-community to plain member and citizen of it." The land ethic rested on one critical assumption: moral standing is derived from citizenship in a community (Leopold 1949). Citizenship entails membership in a political community and carries rights given by the community, minimally the right to political participation. Leopold's trenchant insight about citizenship reflects a historical fact; rights defined in political processes and bestowed on citizens are the only rights consistently upheld in human history. Scientific and social norms against granting citizenship to nonhumans, however, prevented analyses of Leopold's work considering the importance of politics (social relations involving power) in dictating sustainability.

The normative divisions between wildlife, scientists, and society preventing consideration of nonhumans as citizens rely on an ancient rupture between nature and society (Haraway 1997) described historically in Plato's (400 BC: 1944) allegory of the cave. In Plato's allegory the human community existed inside a cave formed by its own delusions. The symbolic cave represented the biases of subjectivity, values, and politics. A philosopher or scientist could leave the cave and apprehend reality in nature. The scientist then had an obligation to the society within the cave. Scientist kings who freed themselves from the cave (e.g., politics, values, and subjectivity in society) to find truth in nature ruled the good society. Scientists would bring their newly discovered truth, unaltered by human perceptions, back into the cave, to silence the "endless chatter of the ignorant mob" (Latour 2004:11). Pervasive calls to "base wildlife management decisions on science not politics" (Public Employees for Environmental Responsibility 1999*b*: 11) and "remove politics from decision making" (Public Employees for Environmental Responsibility 1998:4, 1999*a*:2, 2000, 2003) reflect modern expressions of Plato's myth of the cave.

This dominant worldview makes citizenship incompatible with being a scientist or nonhuman because citizens interact in the cave of social perceptions while scientists and nonhumans act in nature outside the cave. Society's adoption of the cave myth has roots in the work of Descartes and Bacon (Busch 1996), but a 17th century debate between Robert Boyle (1627–1691) and Thomas Hobbes (1588–1679) regarding Boyle's air pump experi-

ments and the existence of a vacuum (Shapin and Schaffer 1985) catalyzed the shift (Latour 1993). Hobbes argued only axioms (self-evident truths) could form knowledge, whereas Boyle promoted experimental verification where knowledge was reliably produced in a laboratory (i.e., the forerunner of statistically defined probabilistic knowledge). Hobbes developed a discourse of society that was independent of nature, and Boyle developed a discourse of nature, independent of the speaker (Latour 1993).

Because empirical realism (Boyle's legacy of basing knowledge on hypotheses tested against observations of reality in nature) and constructivism (Hobbes legacy of basing knowledge on human perception and social experience) emerged from science defined by Plato's allegory of the cave, their proponents frame the debate over rules of science and validity in terms of the human versus nature dualism. Empirical realists maintain that rigorous rules and methods allow the scientist to travel between society and nature with foundational truths in tow, and constructivists assert no one can escape the grasp of society to experience nature. Ironically, empirical realists accept the cave myth in the face of overwhelming empirical evidence suggesting complete objectivity is impossible. The field of science and technology studies has convincingly demonstrated that no amount of self-imposed neutrality or methodological sleight can remove a scientist from her socio-culturally defined perceptions and position (Latour and Woolgar 1979, Haraway 1994, Jasanoff et al. 1995, Kuhn 1962). Accepting Plato's allegory gives ecologists the illusion of objectivity, but strips their power to participate in social processes (Fig. 1).

Constructivism shares empiricism's tendency to separate the human and constructed world from the natural and real world (Demeritt 1998). Constructivists simply argue scientists never leave the cave. The solipsism (belief that only one's own perceptions can be known) of strong constructivist paradigms labels the nonself a construct (Peters 1999). Constructivist epistemologies not only endanger conservation by denying nonhumans citizenship in the land community, they cripple conservation initiatives by suggesting truth is what the powerful believe (Woolgar 1988, Collins and Pinch 1993, Demeritt 1998). Accepting such paradigms equates to accepting today's dominant powers as truth, thereby contributing to their hegemony (Peterson et al. 2005). Moreover, if ecological problems were only social constructs, changing the terms of societal discourse alone could solve them.

Finally Plato's cave myth provides context for environmental ethics. The human–nature divide is expressed in the intrinsic (Callicott 1980, Rolston 1994) versus instrumental (Baxter 1994, Freeman 1994) value debates of environmental ethics (Norton 2005). Intrinsic value theorists argue elements of nature (e.g., individual humans, ecosystems, and species) have inherent value that does not depend on preferences of human valuers. Intrinsically valued entities should be treated as ends, and instrumentally valued entities can be treated as means (Norton 2000). Creation of valueless facts from nature (i.e., cave-based ethics) forces moralists to adopt specious foundationalism, limits them to procedures, or imitates the certitude of naturalism (Latour 2004). Intrinsic value theory accepts the cave myth by making valuation of humans and nonhumans independent of societal processes. Philosophers concerned with values join scientists in the miraculous journey between reality in nature and society in the cave, because exercising an ethical stewardship requires them to bring objective truth regarding intrinsic value back from nature. A focus on inherent value reifies the human and nature dualism as a barrier to nonhuman citizenship in the land community because nature can be axiologically independent of humans. Further, assuming right and wrong exist independent from politics allows society to abdicate responsibility for how it defines right and wrong.

Dismissing the cave myth requires dismissing the intrinsic versus instrumental value division as myth, but some ethicists have suggested dismissing the means versus ends distinction as well. Callicott (1989) argues values are verbs, so the relationship between the valuer and valued becomes more important than either entity. Based on this foundation, Norton (2000) suggests ignoring the means versus ends distinction and focusing more on processes when determining values. Unfortunately, this approach fails to address how wildlife managers can manipulate biophysical processes, one of the fundamental undertakings of management. Humans cannot manipulate processes (e.g., the nitrogen cycle) without manipulating entities (e.g., air, fertilizer, legumes, corn) and making those entities means to human ends.

INTEGRATING SCIENCE, SOCIETY, AND NATURE WITH THE LAND COMMUNITY WORLDVIEW

Dissolving artificial boundaries between nature, science, and society requires starting fresh without the arbitrary boundaries of Plato's cave. In such a world, nature loses the meaning it gained through dialectical comparison to all that is human. The new nature would instead relate to what is outside the land community (Castree and Braun 1998). Nature in this sense refers to the environment outside the bounds of the land community (i.e., noncitizens), not to a cognate of nonhuman. The land community is a society of interdependent human and nonhuman entities that are included in societal decision making. Society refers to a group whose members have developed relationships through interaction. A land community–based worldview has roots in pragmatism because it constrains truth to the land community and what it can experience in its environment (James 1908, Parker 1996).

Pragmatism refers to many ways of thinking, but most versions consider socially experienced effects and consequences critical components of meaning and truth. The possibility of being experienced, alone, constitutes reality, so human and nonhuman actors mutually construct reality by defining what can be experienced. Pragmatic knowledge is constantly negotiated, but succeeds in making sense of the

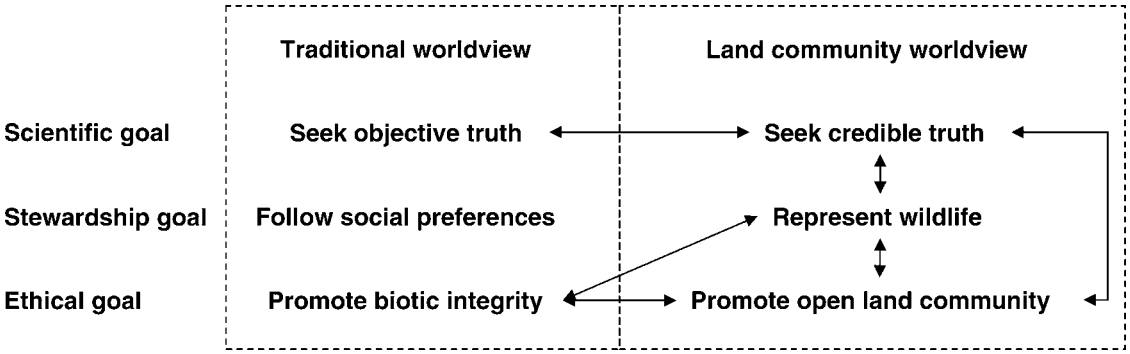

Figure 1. Comparison of internal and external compatibility between wildlife management's goals defined by a traditional worldview and a land community worldview. Goals connected by arrows can be logically compatible in all cases faced by wildlife managers.

world without contradicting experience (James 1908). For pragmatists, no organism, including humans, can know the world without the mediation of experience (Parker 1996). Although objective truth may exist, scientists cannot step out of their skin to access it. Although pragmatism rejects empiricist realism (testing knowledge claims against reality in nature), it embraces empiricism (testing knowledge claims against experience). Pragmatic methods merely shift the focus of science from antecedents (the few laws governing everything) to consequences (James 1908). Good pragmatic science represents the best explanations society has for its experiences. Validity results not from statistical tests or magically leaving the cave of social subjectivity but from political wrangling over those tests and all other forms of information bearing on a subject.

New Scientific Stewardship

Using a pragmatic approach shifts wildlife management's scientific stewardship from seeking objective truth about reality to seeking credible truth about experience (i.e., truth capable of withstanding both social experience and the political debate over what constitutes knowledge). The difference is largely semantic in terms of experimental results. Scientists studying global warming will find the same temperature increases regardless of whether they are sampling reality or human experience with their thermometers. The meaningful difference between approaches emerges in terms of the role scientists and science plays in society. In traditional science, practitioners must convince themselves they are neutral and objective. In pragmatic science practitioners must convince society of knowledge claims. The former approach requires retreating from politics, whereas the latter requires diving into it.

New Public Stewardship

Shifting the primary scientific responsibility from objective truth to credible knowledge allows wildlife management to shift its public stewardship from obeying societal dictates to representing wildlife in political processes (a nonobjective activity). This new public stewardship has roots in Dewey's (1927, 1935) pragmatic philosophy linking science and society through participatory democracy. Dewey did not need to integrate social and biological systems because pragmatism denies any separation between the two. Although Dewey (1927) only considered human experience and experiments, no logical reason prevents nonhumans from experiencing and experimenting. Pragmatism requires all the diverse individuals, whose experiences collectively define reality (i.e., what can be experienced), to actively present their demands, debate their differences, and define their community. Early pragmatists did not explicitly entertain the concept of nonhumans as citizens, so little thought was expended on how nonhumans could participate in the political process. For pragmatists, humans alone defined, discussed, and measured value (Parker 1996).

From a pragmatic perspective, however, communication, similar to reality, emerges from collective community experience (Dewey 1925), and wildlife shapes community experience. Several scholars have suggested means for nonhuman actors to participate in the formation of knowledge. Their approaches, artifactual constructivism (Sismondo 1993), collective formation (Latour 2004), and interactivity (Hayles 1995, Haraway 1997), acknowledge ontological realism (or at least its possibility) but dissolve epistemological distinctions between reality, constructions of reality, society, and nature. These approaches move beyond pragmatism by collapsing the dualism between speaking, valuing, social subjects (humans), and silent objects (nonhumans). Both humans and nonhumans communicate via spokespersons (Peters 1999), and both are social actors (Latour 2004). Humans and nonhumans interact by modifying each other's experiences and consequences, and experimental protocol can document the influence of actors (human and nonhuman) as they associate. Individual actors and associations of human and nonhuman actors can form the speaking, deciding assemblies (i.e., land communities) of Dewey's (1927) deliberative democracy.

Within any democracy, however, experience is simultaneously real, social, and discursive (Haraway 1991, Latour 1993). The composition of the land community is not given by foundationalist reality. That composition must be the object of discourse, and citizens must be capable of participating in the discourse (Hegel 1807). Because nonhumans are real (in that they are experienced) and social, their citizenship hinges on the ability to participate in discourse. Dialogue has been an ideal for discourse since

Plato's Phaedrus (400 BC; Lazarsfeld et al. 1972, Peters 1999). If discourse is limited to dialogue, nonhumans face an insurmountable barrier to citizenship. Ogden and Richards (1956:205–206) saw this ideal of communication as "use of symbols in such a way that acts of reference occur in a hearer which are similar in all relevant aspects to those which are symbolized by them in the speaker."

This vision of communication faces the same practical limits as the myth of the cave. Just as scientists cannot leave society for unbiased communing with nature, individuals cannot leave the self for unbiased communing with the other. Josiah Royce (1965) compared the problem of intersubjectivity to 2 men serving life sentences in adjacent locked rooms. Their only means of contact was by projecting images on the wall of the other's room with a lantern. This allegory demonstrates the impossibility of knowing with certainty what images we project on the minds of others or what inspired the images they project on our minds. Communication as dialogue between humans is no more possible than Dr. Doolittle conversing with animals.

Replacing the illusion of dialogue with the messy and imprecise vision of communication as dissemination (broadcasting symbols [e.g., words, gestures, behavior] and allowing interpretation on the receiving end), allows nonhumans to participate (Peters 1999). Dissemination may inspire chaotic visions of scattered, impersonal, one-way missives, yet parables attributed to Jesus demonstrate the power and efficacy of communication without reciprocity or control over the interpretation of receivers (Peters 1999). The study of disseminations, from scriptures, people, animals, or populations requires hermeneutics, interpretation of texts by unintended receivers. Combining the internal dialogue of hermeneutics with dissemination provides humans and nonhumans a rational forum for discourse.

Wildlife can communicate via dissemination, yet they cannot gain citizenship without spokespersons in the political process of decision-making. The unique linguistic abilities of humans and the potential size and complexity of a land community make defining citizenship via direct democracy logistically impossible, so as with humans in modern democratic nations, wildlife requires representation. When citizenship is bestowed on groups of individuals (e.g., corporations, stakeholder groups, wildlife populations), the groups gain rights and responsibilities just as individual citizens do. Political communities have given corporations the rights to hire and sue and imposed the responsibility not to hire children as laborers. Political communities also have given wolf populations the right to consume deer and prohibited them from threatening livestock operations. Such rights and responsibilities are not natural, or even preferred by the citizens in question (corporations still hire children and wolves still eat livestock), rather they are created and enforced by the larger political community.

For the land community to include nonhuman citizens, wildlife managers need only replace the biological mechanic vision of political stewardship with representation. By representation, we refer to spokespersons speaking in lieu of their constituents within a political process (Latour 2004). By becoming spokespersons for their subjects, wildlife managers promote land community stability by describing the needs of citizens living within its borders. The social charge to represent wildlife can be informal, as with the social charge for grandparents to represent their grandchildren or social deference to the opinions of self-proclaimed wildlife managers. The role as representative, however, can be legally mandated as in requirements for legal guardians to immunize their children or federal mandates for the United States Fish and Wildlife Service to protect endangered species.

Wildlife managers use instruments and experiments to "listen to" wildlife (i.e., carry out their scientific responsibility to develop credible explanations for social experience) and then speak for them with words, statistics, and images. Wildlife scientists acting as representatives merely detect disseminations from nonspeaking citizens (e.g., deer, trees, watersheds), decipher the disseminations, and represent the nonspeaker in the land community's deliberations. The call to represent nonhumans in political processes may seem unusual, but virtually every scientific paradigm accepts a social charge to represent the subject of their research. Conservation biologists, ecologists, and wildlife scientists frequently are spokespersons for endangered species, habitats, and ecological processes. The most influential wildlife managers of all time spoke for nonhumans without compunction. Aldo Leopold (1949) spoke for wolves, who would take an intangible spiritual essence, the fierce green fire, from the land community if exterminated. Later, Rachael Carson (1962) spoke for the birds, who would leave the land community without music if humans did not regulate the use of dangerous chemicals.

Speaking for another community member, however, is a political action, not a revelation of reality. A state senator relies on social science (e.g., polls) to hear the voice of human constituents, but the public invariably questions the reliability of the survey and the integrity of the spokesperson. Likewise, the reliability of wildlife science's instruments and methods and the integrity of wildlife managers will be questioned both from the wildlife management community and from the broader land community to which the proposed version of wildlife management belongs. The rules in land community science (e.g., replication, randomness, parsimony, falsification, hypothesis testing, and self-critical stances) relate to credibility of scientists in political processes rather than how scientists magically traverse the divide between human society and nature. The goals traditionally claimed exclusively by empirical realists or constructivists are coherently combined under the goal of increasing credibility of our representation of wildlife. Validity, reliability, explanation, and prediction (traditionally empirical realist goals) contribute to credibility only when communication and understanding within a community (traditionally constructivist goals) are achieved.

Stewardship as representation allows researchers to be both subjective and objective. When a researcher speaks for

another person or nonhuman, objectivity, as a goal, promotes credibility. If the researcher is speaking with coalitions of people and nonhuman subjectivity is unavoidable and the motivating factor behind speaking. This approach admits scientists are citizens in the land community, and engaged in political processes influencing future citizenship of nonmembers from the environment. After detecting and deciphering disseminations from nonspeaking members of the land community or entities from the environment, wildlife managers present the messages to the land community and join society in the process of incorporating or rejecting the knowledge. If the land community considers the information important, the previously ignored entity from the environment is incorporated within the land community as a citizen; otherwise it is ignored (Latour 2004). Citizenship, however, does not guarantee equal or even fair treatment. Some popular citizens (e.g., pandas, professional athletes) receive preferential treatment, and less appealing citizens (e.g., mosquitoes, terrorists) are hunted, attacked, and exterminated.

New Ethical Stewardship

Finally, rejecting Plato's cave myth encourages adoption of an ethic related to citizenship in the land community. Integrating the land community with ethics addresses the problems and opportunities embodied in means versus ends distinctions (Latour 1993, 2004). Land community ethics reject the human–nature dualism but not the means–ends dualism. To accomplish something, people must treat entities as means. The danger is not treating humans, animals, or rivers as means but in ignoring their status as ends and reifying means–ends distinctions. Land community moralists do not abolish means and ends rendering management impossible; rather they destabilize means–ends distinctions (Fig. 1; Latour 2004). Means constantly appeal for status as ends, but politicians and scientists require boundaries for means and ends within the land community, and economists externalize that which does not fit in either category. Being moral in this system is to reject stabilization in boundaries or constitution of the land community. Premature closure of the land community means too many entities are left outside in the environment and ignored, and stabilization of the land community constitution means too many subjects remain means.

Moralists in this system should entertain the poststructuralist and feminist concern for identifying and challenging hierarchies implicit in binary oppositions (e.g., means vs. ends, empowered vs. powerless, subject vs. object). By destabilizing means–ends boundaries moralists would perform the critical role of making the land community more adaptable in the face of dynamic environments while being champions for the weak (i.e., entities viewed as means). A political ethic would prevent society from abdicating responsibility for its actions, because right is negotiated by society rather than distilled from external sources (e.g., mysticism or rationality). This ethic would remove scapegoats in the form of scientists, philosophers, or demagogues, who previously identified what was right, and make society accountable for the moral norms it creates.

The poststructuralist leanings of an ethical stewardship to the land community would make anti-theory more important than theory. Moralists would champion antifoundationalism, antidualism, and antihierarchyism (Haraway 1997, Keulartz et al. 2004, Latour 2004). Land community ethics essentially reverse their predecessors. Rather than preach the land ethic and hope the land community follows, we suggest admitting the land community already exists, even if one does not like its current constitution, fighting permanent classification of entities as means, and hoping the land ethic follows. Interestingly, the land community ethic prescribes what the intrinsic value theorists have been doing under different pretenses (e.g., animal rights, deep ecology; Naess 1973, Regan 1983), challenging the means status of nonhumans.

MANAGEMENT IMPLICATIONS

The land community worldview facilitates adoption of most cutting-edge wildlife management approaches (e.g., co-management, mediated modeling; Chase et al. 2000, van den Belt 2004, van den Belt et al. 2006) because those approaches provide a forum for wildlife managers to represent wildlife and participate with communities in making management decisions. Within this context, adaptive management (Lee 1993, 1999; Riley et al. 2003) remains important, not because each iteration is narrowing in on objective reality, but because what works scientifically, politically, and ethically is constantly changing. Evaluation and monitoring of adaptive management facilitates communication with and feedback from the nonhumans that wildlife managers represent in the land community. For wildlife management to fully engage in wildlife conservation, however, we must admit we represent wildlife in a political process and join the rest of society in shaping our land community.

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LITERATURE CITED

Ackoff, R. L. 2001. OR: after the post mortem. System Dynamics Review 17:341–346.

Anderson, D. R., K. P. Burnham, and W. L. Thompson. 2000. Null hypothesis testing: problems, prevalence, and an alternative. Journal of Wildlife Management 64:912–923.

Arendt, H. 1994. Eichmann in Jerusalem: a report on the banality of evil. Penguin, New York, New York, USA.

Baxter, W. 1994. People or penguins. Pages 303–307 *in* D. Van De Veer and C. Pierce, editors. The environmental ethics and policy book. Wadsworth, Belmont, California, USA.

Busch, L. 1996. Bringing nature back in: principles for a new social science of nature. Centennial Review 40:491–501.

Callicott, J. B. 1980. Animal liberation: a triangular affair. Environmental Ethics 2:311–338.
Callicott, J. B. 1989. In defense of the land ethic: essays in environmental philosophy. State University of New York Press, Albany, New York, USA.
Carson, R. 1962. Silent spring. Houghton Mifflin, Boston, Massachusetts, USA.
Castree, N., and B. Braun. 1998. The construction of nature and the nature of construction. Pages 3–45 *in* B. Braun and N. Castree, editors. Remaking reality: nature at the millennium. Routledge, London, United Kingdom.
Chase, L. C., T. M. Schusler, and D. J. Decker. 2000. Innovations in stakeholder involvement: what's the next step? Wildlife Society Bulletin 28:208–217.
Cherry, S. 1998. Statistical tests in publications of The Wildlife Society. Wildlife Society Bulletin 26:947–953.
Collins, H. M., and T. Pinch. 1993. The golem: what everybody should know about science. Cambridge University Press, Cambridge, Massachusetts, USA.
Decker, D. J., C. C. Krueger, R. A. J. Baer, B. A. Knuth, and M. E. Richmond. 1996. From clients to stakeholders: a philosophical shift for fish and wildlife management. Human Dimensions of Wildlife 1:70–82.
Demeritt, D. 1998. Science, social constructivism and nature. Pages 173–193 *in* B. Braun and N. Castree, editors. Remaking reality: nature at the millennium. Routledge, New York, New York, USA.
Dewey, J. 1925. Experience and nature. Open Court, Chicago, Illinois, USA.
Dewey, J. 1927. The public and its problems. Holt, New York, New York, USA.
Dewey, J. 1935. Liberalism and social action. G. P. Putnam, New York, New York, USA.
Freeman, A. M. 1994. The ethical basis of the economic view of the environment. Pages 307–315 *in* D. Van De Veer and C. Pierce, editors. The environmental ethics and policy book. Wadsworth, Belmont, California, USA.
Geist, V., S. P. Mahoney, and J. F. Organ. 2001. Why hunting has defined the North American model of wildlife conservation. Transactions of the North American Wildlife and Natural Resources Conference 66:175–185.
Guthery, F. S., L. A. Brennan, M. J. Peterson, and J. J. Lusk. 2005. Information theory in wildlife science: critique and viewpoint. Journal of Wildlife Management 69:457–465.
Guthery, F. S., J. J. Lusk, and M. J. Peterson. 2001. The fall of the null hypothesis: liabilities and opportunities. Journal of Wildlife Management 65:379–384.
Haraway, D. 1991. Simians, cyborgs and women: the reinvention of nature. Free Association, London, United Kingdom.
Haraway, D. 1994. A game of cat's cradle: science studies, feminist theory, cultural studies. Configurations 1:59–71.
Haraway, D. 1997. Modest_Witness@Second_millenium. FemalemanC_meets_OncoMouse T: feminism and technoscience. Routledge, New York, New York, USA.
Hayles, N. K. 1995. Searching for common ground. Pages 47–63 *in* M. E. Soulé and G. Lease, editors. Reinventing nature?: responses to postmodern deconstruction. Island Press, Washington, D.C., USA.
Hegel, G. W. F. 1807. Phenomenology of spirit. 1977, Reprint. Oxford University Press, New York, New York, USA.
Herman, S. G. 2002. Wildlife biology and natural history: time for a reunion. Journal of Wildlife Management 66:933–946.
James, W. 1908. Pragmatism: a new name for some old ways of thinking; popular lectures on philosophy. Longmans, Green, New York, New York, USA.
Jasanoff, S., G. E. Markle, J. C. Petersen, and T. Pinch, editors. 1995. Handbook of science and technology studies. Sage, Thousand Oaks, California, USA.
Johnson, D. H. 1999. The insignificance of statistical significance testing. Journal of Wildlife Management 63:763–772.
Keulartz, J., M. Schermer, M. Korthals, and T. Swierstra. 2004. Ethics in technological culture: a programmatic proposal for a pragmatist approach. Science, Technology, & Human Values 29:3–29.
Kuhn, T. S. 1962. The structure of scientific revolutions. Third edition. 1996, Reprint. University of Chicago Press, Chicago, Illinois, USA.
Latour, B. 1993. We have never been modern. Harvard University Press, Cambridge, Massachusetts, USA.
Latour, B. 2004. Politics of nature: how to bring the sciences into democracy. Harvard University Press, Cambridge, Massachusetts, USA.
Latour, B., and S. Woolgar. 1979. Laboratory life: the social construction of scientific facts. Sage, Beverly Hills, California, USA.
Lazarsfeld, P. F., A. K. Pasanella, and M. Rosenberg. 1972. Continuities in the language of social research. The Free Press, New York, New York, USA.
Lee, K. N. 1993. Compass and gyroscope: integrating science and politics for the environment. Island Press, Washington, D.C., USA.
Lee, K. N. 1999. Appraising adaptive management. Conservation Ecology 3(2). <http://www.ecologyandsociety.org/vol3/iss2/art3/>. Accessed 4 Jun 2007.
Leopold, A. 1933. Game management. The University of Wisconsin Press, Madison, USA.
Leopold, A. 1949. A sand county almanac and sketches here and there. Oxford University Press, London, United Kingdom.
Naess, A. 1973. Shallow and deep, long-range ecology movement: a summary. Inquiry—an Interdisciplinary Journal of Philosophy 16:95–100.
Norton, B. 1988*a*. Commodity, amenity, and morality: the limits of quantification in valuing biodiversity. Pages 200–205 *in* E. O. Wilson, editor. Biodiversity. National Academy Press, Washington, D.C., USA.
Norton, B. 1988*b*. What is a conservation biologist? Conservation Biology 2:237–238.
Norton, B. 2000. Biodiversity and environmental values: in search of a universal earth ethic. Biodiversity and Conservation 9:1029–1044.
Norton, B. 2005. Sustainability: a philosophy of adaptive ecosystem management. University of Chicago Press, Chicago, Illinois, USA.
Ogden, C. K., and I. A. Richards. 1956. The meaning of meaning: a study of the influence of language upon thought and of the science of symbolism. Harcourt, Brace, New York, New York, USA.
Parker, K. A. 1996. Pragmatism and environmental thought. Pages 21–37 *in* A. Light and E. Katz, editor. Environmental pragmatism. Routledge, New York, New York, USA.
Peters, J. D. 1999. Speaking into the air: a history of the idea of communication. University of Chicago Press, Chicago, Illinois, USA.
Peterson, M. N., M. J. Peterson, and T. R. Peterson. 2005. Conservation and the myth of consensus. Conservation Biology 19:762–767.
Plato. 1944. The Republic. Heritage Press, New York, New York, USA.
Public Employees for Environmental Responsibility. 1998. California Department of Fish & Game Survey Division of Wildlife (DOW) employee survey. <http://www.peer.org/pubs/surveys.php>. Accessed 12 Oct 2006.
Public Employees for Environmental Responsibility. 1999*a*. Florida Department of Environmental Protection survey. <http://www.peer.org/pubs/surveys.php>. Accessed 12 Oct 2006.
Public Employees for Environmental Responsibility. 1999*b*. Nebraska Game & Parks Commision survey. <http://www.peer.org/pubs/surveys.php>. Accessed 12 Oct 2006.
Public Employees for Environmental Responsibility. 2000. Montana Department of Environmental Quality survey. <http://www.peer.org/pubs/surveys.php>. Accessed 12 Oct 2006.
Public Employees for Environmental Responsibility. 2003. Colorado Division of Wildlife (DOW) employee survey. <http://www.peer.org/pubs/surveys.php>. Accessed 12 Oct 2006.
Ravetz, J. R. 1971. Scientific knowledge and its social problems. Clarendon Press, Oxford, United Kingdom.
Regan, T. 1983. The case for animal rights. University of California Press, Berkeley, USA.
Riley, S. J., D. J. Decker, L. H. Carpenter, J. F. Organ, W. F. Siemer, G. F. Mattfeld, and G. Parsons. 2002. The essence of wildlife management. Wildlife Society Bulletin 30:585–593.
Riley, S. J., W. F. Siemer, D. J. Decker, L. H. Carpenter, J. F. Organ, and L. T. Berchielli. 2003. Adaptive impact management: an integrative approach to wildlife management. Human Dimensions of Wildlife 8:81–95.
Rolston, H., III. 1994 Conserving natural value. Columbia University Press, New York, New York, USA.
Romesburg, H. C. 1981. Wildlife science—gaining reliable knowledge. Journal of Wildlife Management 45:293–313.

Royce, J. 1965. The religious aspect of philosophy: a critique of the bases of conduct and of faith. Peter Smith, Gloucester, Massachusetts, USA.
Shapin, S., and S. Schaffer. 1985. Leviathan and the air-pump: Hobbes, Boyle, and the experimental life. Princeton University Press, Princeton, New Jersey, USA.
Sismondo, S. 1993. Some social constructions. Social Studies of Science 23: 515–553.
The Wildlife Society. 2006. Bylaws of The Wildlife Society. <http://www.wildlife.org/leadership/2006bylaws.pdf>. Accessed 4 Jun 2007.
Traweek, S. 1988. Beantimes and lifetimes. Harvard University Press, Cambridge, Massachusetts, USA.
van den Belt, M. 2004. Mediated modeling: a system dynamics approach to environmental consensus building. Island Press, Washington, D.C., USA.
van den Belt, M., O. A. Bianciotto, R. Costanza, S. Demers, S. Diaz, G. A. Ferreyra, E. W. Koch, F. R. Momo, and M. Vernet. 2006. Mediated modeling of the impacts of enhanced UV-B radiation on ecosystem services. Photochemistry and Photobiology 82:865–877.
Woolgar, S. 1988. Science the very idea. Tavistock, London, United Kingdom.

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