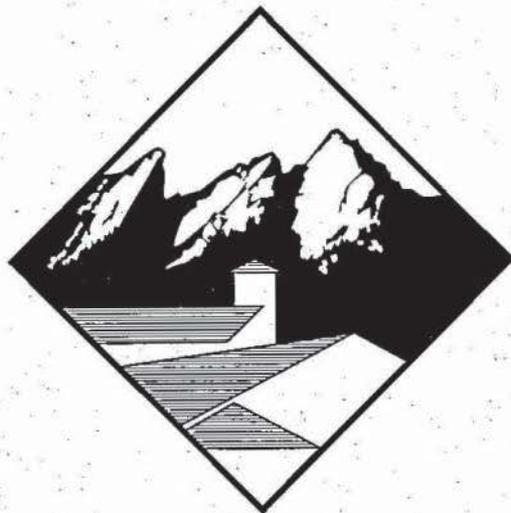


# Natural Resources Law Center University of Colorado School of Law

## PEOPLE AS PART OF ECOSYSTEMS

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Associate Professor of Geography  
University of Colorado

Public Land Policy Discussion Papers Series



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# PEOPLE AS PART OF ECOSYSTEMS

William E. Riebsame<sup>1</sup>

## Introduction

This paper resides, conceptually, between the economics and conservation biology papers in the Public Land Policy Discussion Papers Series prepared under the Natural Resources Law Center's Western Lands Sustainability Project. One could argue that two poles anchor our discussions on western lands. The first is encapsulated in the discussion of the extensive area around Yellowstone National Park needing special management to maintain a minimum viable population of grizzly bears, found in Wilson Crumpacker's conservation biology paper for this series. One response to this discussion is: that's what the bears need in a biological sense, but what about the people inside that perimeter? The other conceptual pole is anchored by the economic argument in Richard Wahl's paper that capital — both natural and industrial — is fungible, that substitutions and transfers of all types can and should occur. To overstate the argument, the first scene takes humans out of the picture and the second view belittles the notion that ecosystems are irreplaceable and non-reproducible, once degraded, or that they have intrinsic value.<sup>2</sup> The former perspective might prescribe sustainability via a hands-off-nature approach (get people out of nature's way), while the latter might doubt that there is a sustainability problem in the first instance, but prescribe, if we insist on a remedy, an approach of hands-off-the-market!

Even this bracketing, however, yields almost unlimited space for exploring notions of nature and society relationships, so I limit my scope in a few ways. First, I briefly examine the history of people/nature ideas and "lay" discourse (among the proverbial people-in-the-

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<sup>2</sup>To be fair, Crumpacker argued that the perimeter described a zone of necessary peaceful co-existence between bears and people, and Wahl recognizes the limits of economic approaches, arguing that many ecosystem decisions are "inherently political," and thus not subject to econometric analysis.

street). Next, I explore several fields of social sciences that study people as part of ecosystems. Finally, I cut to the case, making some of the many arguments about nature and society interaction concrete by applying them to federal rangeland policy.

### **Lay Discourse: Humankind's Relationship to Nature**

Perhaps the most important question facing humankind is, simply, what ought to be our relationship to non-human nature. Common discourse and lay arguments reveal many alternative views of that relationship, encapsulated, for example, in the anthropocentric refrain that humans are part of ecosystems, so human actions (e.g., putting cattle on the range) are "natural." This argument — in all its simplicity — emerged in the rancher/environmentalist discussions of Secretary of Interior Bruce Babbitt's proposed rangeland reforms, discussed below (and has, I understand, been invoked by talk show host Rush Limbaugh). A more sophisticated version is offered in Gregg Easterbrook's A Moment on Earth: humans have degraded nature but are also now protecting it, and, in the larger scheme, an asteroid caused species extinctions in the past at least as significant as the current, human-caused species die-off.

Yet, the daily experience of most humans is one of natural exceptionalism: we seem so different and apart from nature that we hardly recognize any naturalistic elements of the human condition. In an essay appropriately titled "Part and Apart: Issues in Humankind's Relationship to the Natural World," geographer Robert Kates suggested that our sense of separateness came early, as humans learned to make tools, and was quickly reinforced by religious dogma.<sup>3</sup> David Lowenthal, similarly attempting to lay out the history of human environmental perception, further argues that notions that we were a bad influence on nature did not appear until quite recently.<sup>4</sup>

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<sup>3</sup>Kates, Robert W., "Part and Apart: Issues in Humankind's Relationship to the Natural World," in Hare, F.K. (ed.), The Experiment of Life: Science and Religion (Toronto: University of Toronto Press, 1983).

<sup>4</sup>Lowenthal, David, "Awareness of Human Impacts: Changing Attitudes and Emphases," in Turner, B. L. II et al. (eds.), The Earth as Transformed by Human Action: Global and Regional Changes in the Biosphere Over the Past 300 Years, at p. 121 (Cambridge University Press, 1990).

Modern environmentalism is based on a merger of these two views: we are exceptional, and we are damaging in that exceptionalism. Furthermore, human-induced degradation is different from other types of environmental changes (e.g., asteroids causing extinctions) because we are conscious of its effects and can choose not to degrade nature. The prescription: we must re-submit to the dictates (i.e., the limits) of nature in everything we do, from agriculture to flood control.

Contemporary discourse on the people/nature nexus is typically constructed to press quite specific points, as when ranchers or loggers argue that the rural economy is part of ecology and, thus, it must be sustained just as the grassland or forest ecology must be sustained (presumably by grazing more cows or cutting more trees). Little thought backs up these assertions, and, in making such points, the extractive interests routinely ignore studies indicating that extractive industries are not the backbone of even rural economies in the West.<sup>5</sup> They also rather easily cast human preservation of nature (like wilderness creation or species reintroduction) as "unnatural." On the other hand, environmentalists, in their exceptionalist arguments, conveniently ignore evidence of longstanding human transformation of ecosystems, are ambivalent especially about prehistoric human presence in ecosystems, and engage in tail-chasing debates about just what is "natural" or the "balance of nature," and what human interventions are justified in restoring "naturalness" or "balance."<sup>6</sup>

The most searching assessment of these debates through history unfortunately stops at 1800. Nevertheless, Clarence Glacken's classic book, Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century,<sup>7</sup> brings a huge body of scholarship to bear on how people and nature have interacted, mostly

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<sup>5</sup>See Power, T.M., "Ecosystem preservation and the economy in the Greater Yellowstone Area," Conservation Biology volume 5, at p. 395 (1991); Power, T.M. "Thinking About Natural Resource-Dependent Economies: Moving Beyond the Folk Economics of the Rear-View Mirror," in Knight, Richard L. and Sarah F. Bates (eds.), A New Century for Natural Resources Management, at p. 235 (Washington, DC: Island Press, 1995); Rasker, Raymond, "A New Look at Old Vistas: The Economic Role of Environmental Quality in Western Public Lands," University of Colorado Law Review, volume 65, at p. 369 (1994).

<sup>6</sup>This was forcefully argued by philosopher Alston Chase for Yellowstone National Park; see Chase, Alston, Playing God in Yellowstone (New York: Harcourt, Brace, Jovanovich, 1987).

<sup>7</sup>Glacken, Clarence J., Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century (Berkeley: University of California Press, 1967).

through implication from what people thought (and wrote) about nature over time. Glacken poses three "great questions" in western thought about people's relationship to the "habitable earth": 1) was the Earth purposefully made for human inhabitancy? 2) have the Earth's physical qualities influenced and molded human culture and character? and 3) how have people, in their long tenure on the earth, "changed it from its hypothetical pristine condition?" All three questions are still asked and reflect necessary discussions in the Natural Resources Law Center's Western Lands Sustainability Project, but the last warrants the most attention here. About a third of Glacken's 763-page, benchmark book shows how the question of the human impact has been posed and answered. The most striking character of this millennial inquiry has been the tendency through history for people to see practically all human transformation of ecosystems as positive (or, at least, to explain the most odious changes as temporary or caused by annoyed deities or nature's own perversities).

Lowenthal's equally sweeping (but considerably shorter) treatise extends a Glacken-like analysis to the present; he agrees that our exceptionalist self-image is longstanding, even fundamental to humanness, but concludes, surprisingly (to me at least), that across the thousands of years that we modified the natural world to our uses (clearing forests, domesticating plants and animals, and creating new materials), it only dawned on us seriously in the late-1800's that these transformations might not all be good.<sup>8</sup> Lowenthal dates this to George Perkins Marsh's 1864 book, Man and Nature, and to Marsh's scathing critique of late-19th century Vermont landscape degradation. Udall labels Man and Nature, simply, "the beginning of wisdom" in a thus-titled chapter devoted to Marsh's work in his own 1963 classic, The Quiet Crisis.

This chink in the armor of self-satisfaction widened with the turn of the century as the progressive conservationists pounced on wasteful land and water uses, and called for scientific and rational principles of resource management. The conservation movement gained popular support in large measure by images of squandered resources in the West brought to the eastern intelligentsia via magazines like *Harpers*: bison carcasses to the horizon, and the wounds of placer mining in California. Beginning in the 1890's, congress considered

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<sup>8</sup>See Lowenthal, *supra* note 4.

hundreds of bills to protect forests, reduce floods and soil erosion, and retain wildlife. To some observers, this is the epochal change that laid the groundwork for modern American environmentalism, based on the work of Muir, Pinchot, Roosevelt. Others point out that it took the terrible waste of the 1934-36 Dust Bowl debacle to truly establish environmental conservation as a going concern in America, while historian Patricia Limerick and law professor Charles Wilkinson might argue that a goodly portion of present public lands resource management (e.g., below-cost timber sales, royalty-free mining, and sweetheart grazing permits) looks suspiciously like the frontier practices that the progressives were supposedly putting to rest.<sup>9</sup>

In light of the long, and apparently enduring notion that human use and transformation of ecosystems is benign, one can hardly be surprised that many people still reject the indictments of environmentalism. And the cant of techno-optimists (both intellectual — e.g., Julian Simon or Gregg Easterbrook — and anti-intellectual — e.g., Rush Limbaugh or Dixie Lee Ray) appears less revisionist than simply deep-rooted.

Even the most vaunted cases of human-induced degradation did not convince everyone, and are not immune to anti-environmental revisionism. The 1930s Dust Bowl droughts appeared to be the first, obvious human-induced ecological disaster in the New World.<sup>10</sup> But the Dust Bowl, and long-term sustainability of the Great Plains, is a wonderful example of conflict over the yin and yang of the human role in ecosystems: creation on the Plains of the world's most productive grain region is seen either as a triumph of technological adaptation and innovation, or an obvious case of unsuitable development just waiting to be pushed over the edge into another, perhaps this time permanent, ecological disaster.<sup>11</sup>

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<sup>9</sup>Limerick, Patricia N., *The Legacy of Conquest: The Unbroken Past of the American West* (New York: W.W. Norton, 1987); Limerick, Patricia N., "The Forest Reserves and the Argument for a Closing Frontier," in Steen, Harold K. (ed.), *The Origins of the National Forests*, at p. 10 (Durham, NC: Forest History Society, 1992); Wilkinson, Charles F., *Crossing the Next Meridian: Land, Water and the Future of the West* (Washington, DC: Island Press, 1992).

<sup>10</sup>Worster, Donald, "Grassland Follies: Agricultural Capitalism on the Plains," in *Under Western Skies: Nature and History in the American West*, at p. 93 (New York: Oxford University Press, 1992).

<sup>11</sup>The optimistic assessment of Great Plains sustainability appears in, for example, Smika, D.E., "Cereal Systems of the North American Central Great Plains," in Pearson, C.J. (ed.), *Field Crop Ecosystems*, at p. 401 (Amsterdam: Elsevier, 1992) and Hargreaves, Mary W., *Dry Farming in the Northern Great Plains* (Lawrence,

My own take on this has been:

- 1) to marvel that we could use a region for over a century in a particular way and still be divided over the sustainability of that use;
- 2) that the system is sustainable only with large outside subsidies of finance, risk capital, pork, and energy — and that these subsidies are likely to run out before the ecological draw-down causes crisis; and
- 3) that its apparent sustainability is conditional and temporary in some longer time-frame.<sup>12</sup>

Perhaps my first response is the most important for our deliberations on western lands. It suggests that we may not be able, as often assumed, even to identify unambiguous cases of unsustainability! Furthermore, I can attest first-hand that Great Plains folks take great umbrage at any criticism of their noble efforts to create a great agricultural region out of a semi-arid grassland. How on earth, they argue, can anyone think that Plains farming is unsustainable? Look at the blood, sweat, tears and money they have poured into their farms, look at their good wheat crop this year (never mind last year's drought), and don't forget the hardships overcome to make this place productive! Can't you see that they have succeeded in what Rene Dubos called "the wooing of earth." Faith in technology and an abiding belief that humans can and must make ecosystems more productive simply oozes out of Plains folk, Rocky Mountain ranchers, and a host of others who extract resources.

Such reasoning, which is both simple and complicated, underlies a great deal of conflict over western public lands policy, as illustrated later in this paper with the case of federal rangelands. The section below first explores how some social scientists are approaching the "people-as-part-of-ecosystems" issue.

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KS: University Press of Kansas, 1993). The pessimists include Popper, D.E. and F.J. Popper. "The Great Plains: From Dust to Dust," *Planning*, at p. 13 (Dec. 1987).

<sup>12</sup>Riebsame, William E., "Sustainability of the Great Plains in an Uncertain Climate," *Great Plains Research*, volume 1, at p. 133 (1991); Riebsame, William E., "The United States Great Plains," in Turner, B. L. II et al. (eds.), *supra* note 4, at p. 561.

## Academic Approaches to People/Ecosystem Relationships

Arguments about the appropriate place of humans in nature fill volumes of literature, and quickly merge into questions of ethics. The further question for this paper is whether some useful insights into people/ecosystem relationships can be found in the work of social scientists specifically addressing that relationship. "Useful" might mean insights that can illuminate the lay discourse and/or inform land management decisions — or that at least help us with the knotty problem of simply conceptualizing and evaluating people/ecosystems relationships.

Two main thrusts appear in nature and society analysis. The first has no widely-accepted label but is a longstanding effort to assess and explain the human transformation of earth and its ecosystems. The second is a constellation of ecologically-informed social science sub-disciplines often labeled either "human ecology" or "cultural ecology," the practitioners of which try to study the interaction of people and nature rather than getting stuck in one-way models of people affecting nature or nature affecting people.

## Evaluating and Explaining Human Transformation of Ecosystems

Humans have perturbed ecosystems since they learned to manipulate their surroundings,<sup>13</sup> and some scientists, especially archaeologists, have tried to understand this process over the entire span of human existence. Most contemporary efforts examine the scale and quality of human-induced environmental change over the past three hundred years or so, as human population and technology burgeoned and the net human effect became global in scope.<sup>14</sup>

Analysts try to unravel the human signal in everything from range vegetation to global climate — an implicit posture that humans are an exceptional and external element "apart from" nature — and that humans are degrading, or at least changing, ecosystems from their "natural" state. Results of this work indicate that humans have altered the structures and

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<sup>13</sup>This argument can be translated into the contention that no non-human nature survives, a point that bedevils preservationist thinking and makes the Park Service's job of preserving nature seem a Sisyphean task.

<sup>14</sup>See Turner, B.L. II, et al., *supra* note 4, for a global survey of the human transformation of ecosystems.

processes of natural systems at all scales, from local wetlands to the oceans and (maybe) even global climate. The tacit message is that human perturbation is bad, and that non-human nature (if one can find it) provides a model or benchmark of what is "right" or "proper" — for everything from the acidity of rainfall to average global surface temperature (Glacken's "hypothetical pristine earth"). This notion is strong within ecological research, which tends to focus on "undisturbed" sites and where the human signal is considered as a confounding factor laid over the natural processes to be studied.<sup>15</sup>

The human transformation of ecosystems, according to social scientists, is driven by a set of universal factors: human population growth, the growth of affluence and consumption, technological innovation, intensifying and expanding agricultural, urban, and industrial land use, and attitudes and values in which natural systems are seen as the equivalent of factories producing commodities for human consumption. These processes are at the heart of an effort to study the "human dimensions" (HD) of global change. The logic for HD studies is simple: most contemporary environmental problems derive from human behavior, and natural science analysis is thus insufficient to understand, or to predict, environmental change. The HD research community has identified two broad areas for analysis: industrial metabolism and land use change.<sup>16</sup> Industrial metabolism focuses on production/consumption systems that result in environmental changes like increased atmospheric CO<sub>2</sub> or toxic chemicals in the biosphere. Land use studies seek better understanding of driving forces, patterns, and ecological and social effects of land use and cover changes like deforestation and the spread of human settlement.

Growing interest by social scientists in a field long dominated by physical scientists has yielded a useful, multidisciplinary systems framework for people/ecosystem analysis. This physical-social collaboration is useful not because it necessarily produces accurate predictions

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<sup>15</sup>Ecologists have, however, slowly embraced a pragmatic view of how social factors influence ecosystem management, recognizing that management options not only come from socially-constrained science, but also must be implemented in socially-constructed contexts. They have not, however, gone so far as to recognize that there is no "natural" nature out there, and their work still focuses on a nature that could exist only if industrial humans were not present.

<sup>16</sup>Stern, P. C., O. R. Young, and D. Druckman (eds.), Global Environmental Change: Understanding the Human Dimensions (Washington, DC: National Academy Press, 1992).

of human interaction with natural ecosystems, but, to my mind, because it demanded that social scientists create a collective conceptual schema of human action that withholds pride of place from any one discipline. The initial coming together of ecologically-oriented social scientists suggested that we know a great deal about the social structures that mold the interaction of people and ecosystems: economic incentive/disincentives, property rights and tenure systems, common property arrangements, interest group (stakeholder) configurations, consumption patterns, and individual choices on everything from family size to recycling. But the great enterprise of HD research has also been groping for theoretical and practical ways to integrate these factors into ecosystems analysis and management; social scientists are also beginning to sense the sobering scope of institutional change needed to achieve ecosystem sustainability in a biosphere dominated by human activity.

Because it was evoked chiefly by concerns over global warming, ozone depletion, and species extinction (the big three "global changes"), human dimensions research reifies global-scale thinking. Many social analysts argue, however, that resources management, land use, and ecosystems management are better understood as local and regional social processes, and that analysis must be appropriately scaled to social features: environmental perception and decision-making by individuals and institutions, land tenure and use customs and laws of regions, cultures, and the insinuation of capitalist forms of production and trade into trade and geo-politics. Indeed, the most recent addition to the International Geosphere-Biosphere Program (IGBP — the international global change research framework) is a major effort to assess causes of land use and cover change that will be built from regional case studies arrayed in a global conceptual framework. The regional and community focus of land management efforts in the West, like watershed and ecosystem management, will likely become the standard in HD work as the inability to define people/ecosystem interaction at the global scale becomes even more apparent.

### **Insights From the Ecological Social Sciences**

Analysis of nature/society relations is a small but longstanding part of anthropology, economics, geography, and sociology, and has especially burgeoned of late in the policy sciences, history, law, design professions, and, of course, the natural resource professions

(e.g., wildlife and range management). Some fields of ecological social science — ones that have developed relatively separate identities (often betokened by the term "ecology" appended to social science specialties — e.g., human ecology, social ecology, cultural ecology and political ecology) — have tried to bridge the people/nature dualism in a more fundamental way than, say, the fields that apply purely social scientific tools to specific resources (e.g., range economics), but it remains to be seen how successful they have been.

Indeed, though most practitioners of the academic "social ecology" disciplines claim to recognize, and to analyze, the "interaction" of people and ecosystems, in reality some sub-fields tend to study either the effects of nature on society (human and cultural ecology) or society on nature (political ecology), the latter recently ascendent. The following discussion of ecological social sciences is organized into two broad classes of research: culture and behavior, and institutions and policy.

### Culture and Behavior

Researchers studying the social traditions people bring to their interactions with ecosystems, their patterned behavior and institutions, their values, and their perception of the environment call themselves human ecologists or cultural ecologists, sometimes assuming a differentiation between focus on the individual (the former) and the collective (the latter).

The cultural ecologists have perhaps the greatest foundation in natural ecology because they borrowed biological adaptation theory to explain features of human societies. The literature here is huge, but nicely catalogued by Emilio Moran in his book on "ecological anthropology."<sup>17</sup> Moran and others seek ecological explanations for essentially every social feature (an effort paralleled by the socio-biologists). For example, Moran suggests that arctic peoples' tradition of inter-village (distant) marriage is an effort not only to avoid genetic inbreeding, but to create a social structure of reciprocity that obligates individuals to the temporary large-scale alliances needed to follow and hunt herds of migrating ungulates. In

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<sup>17</sup>Moran, Emilio F., Human Adaptability: An Introduction to Ecological Anthropology (Boulder, CO: Westview Press, 1979).

short, societies are adaptive systems or super-organisms responding to their environment like any other organism.

Cultural ecology has been criticized (and even branded irrelevant) because it focuses on small-scale, traditional societies that, if they exist at all in the modern world, bear no resemblance to the behavior of most humans now extant on the planet.<sup>18</sup> The rise of "political ecology," discussed below, is an aversion to the environmental determinism, social Darwinism, and focus on isolated, pre-industrial societies, common to cultural ecology.

Human ecologists also accept the adaptational model (e.g., that people adapt socially — or sometimes mis-adapt socially — to nature in ways similar to how organisms adapt physically, but tend more often to examine individuals in modern society, and to focus on the individual's perception of the environment as a social process (or filter) that explains why so much "mal-adaption" seems to persist.<sup>19</sup> While the notion of "environmental perception" is often treated simply as "attitudes" about the environment by policy makers wanting to know what people might respond to an environmental issue, human ecologists operate on a more complex model: perception as a social and cognitive process of information filtering and interpretation that eventually yields "images in people's heads" of the environment.<sup>20</sup> These images are value-laden, but also shaped by the physical environment.

Because one of their goals was to explain the apparent lack of adaptation in modern society, perception researchers tended to stress how people mis-perceive nature: research has shown that people have difficulty defining what is "natural" and tend to perceive many natural processes, like fire, pest outbreaks, wildlife winter-kill, and predation as "bad."<sup>21</sup> People also have difficulty perceiving slow, cumulative change, and tend uncritically to accept the current

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<sup>18</sup>Porter, P.K., "Geography as Human Ecology: A Decade of Progress in a Quarter Century," American Behavioral Scientists, volume 24, at p. 15 (1980).

<sup>19</sup>Whyte, A.V.T., "From Hazard Perception to Human Ecology," in Kates, R.W., and I. Burton (eds.), Geography, Resources and Environment, Vol. II, at p. 240 (Chicago: University of Chicago Press, 1987).

<sup>20</sup>Aitken, S.C., S.L. Cutter, K.E. Foote, and J.L. Sell, "Environmental Perception and Behavioral Geography," in Gaile, G.L. and C.J. Wilmott (eds.), Geography in America, at p. 218 (Columbus, OH: Merrill, 1989).

<sup>21</sup>This perception produces pressure for controlling ecosystem processes — control that often gets us in trouble, e.g., wildlife winter/emergency feeding programs — especially evident during the Yellowstone fires of 1988.

landscape as the basis for "natural," "correct," or desired landscape. People cannot readily understand the behavior of complex systems, and cannot intuitively grasp multiple-scale interactions. One despairs whether we can ever communicate ecological complexity to people!<sup>22</sup>

Resource user perceptions may differ significantly from manager perceptions. In one early, now classic study, Robert Lucas showed that wilderness users were *more tolerant* of human impacts on wilderness than were land managers, despite managers' insistence that backpackers and others demanded pristine wilderness.<sup>23</sup> Imagine, then, the conflicting attitudes and perceptions that will emerge when we ask people to define "range of natural variation" and "desired plant community" or "desired future conditions" under ecosystem management. This is one reason that land managers have come to expect conflict about essentially every resource decision, though they may not comprehend the underlying logic of perceptions that fuel those tensions.

### Institutions and Policy

Social scientists think of institutions in two main ways: as formal organizations and bureaucracies like the U.S. Forest Service or National Park Service, and as cultural features like land ownership structures and types of economy. Countless histories of natural resource institutions of the first kind reveal the shifting ideas and historical contexts that shaped their modern structure, but tend to go easy on their purposeful social and political construction, neglecting, for example, the use of control over land to dominate or exclude social groups or to validate scientific theories of the day. To some extent, Robert Nelson remedies this in an era-ending epitaph to the "progressive" ideal of natural resources management in which

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<sup>22</sup>A huge body of work has developed on peoples' perception of nature and of complexity and risks. Nature perception is reviewed in Kaplan, Rachel and Stephe Kaplan, The Experience of Nature: A Psychological Perspective (Cambridge University Press, 1989). The classic piece on human understanding of risk and complex systems was Tversky, A. and D. Kahneman, "Judgment Under Uncertainty: Heuristics and Biases," Science, volume 185, at p. 1124 (1974) — which is the subject of several researchers, e.g., Paul Slovic and colleagues at Decision Research Incorporated in Eugene, OR.

<sup>23</sup>Lucas, Robert C., "Wilderness Perception and Use: The Example of the Boundary Waters Canoe Area," Natural Resources Journal, volume 3, at p. 394 (1964).

enlightened public technocrats apply science for the good of all resource users.<sup>24</sup> Nelson argues that the "institutions" that really have power in the American context — special interest groups of all sorts — have overridden scientific management by at least blocking action (while perhaps not getting their particular notion of correct management actually implemented). This social locus of grid-lock frees us from other apologies for the dismal performance of centralized, progressive management, excuses such as the stale argument that our natural resource institutions don't work because of their un-ecological jurisdiction, or because people just don't understand science. We have indeed carved up the landscape and management responsibilities in ways that do not make ecological sense, and people do sometimes mis-understand scientific results, but Nelson argues that the real cause of institutional failure has been fragmentation of the American social landscape. I would add that this is especially true in the West.

But Nelson only hints at the more complex logic behind institutional structure and behavior, such as incestuous relationships between, say, schools of forestry and the Forest Service, and among the iron triangle of range science departments, the BLM, and cattle producers. My own reading of the range science literature suggests that even its most "objective" and narrow research is flavored by a longstanding acceptance of the correctness of domestic grazing of the western range.

In a sense, institutions have "perceptions" too, especially when they institutionalize scientific concepts — creating an internal inertia while external science may move on to new ways of looking at the world. The debate over range condition illustrates this institutional lag. Traditional notions of vegetation succession are replaced with more complex ideas of multiple-steady-states, with some analysts arguing that the old system of rating range condition (good, poor, fair, etc.) not only poorly reflects range ecosystem dynamics, but also causes unnecessary conflict among range interests.<sup>25</sup>

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<sup>24</sup>Nelson, Robert H., Public Lands and Private Rights: The Failure of Scientific Management (Lanham, MD: Rowman and Littlefield, 1995).

<sup>25</sup>The on-going debate over how to assess range condition can be traced in: Joyce, L.A., "The Life Cycle of the Range Condition Concept," Journal of Range Management, volume 46, at p. 132; Laycock, W.A., "Stable States and Thresholds of Range Condition in North American Rangelands: A Viewpoint," Journal of Range

Another institutional hindrance to ecosystems thinking has been the division between research and practice within resource management agencies. Agencies have tended to separate their research branches from their management arms, creating university-like divisions distanced from on-the-ground management and problem solving. Agency researchers receive incentives to publish in scientific journals, resulting in narrowly-focused work not useful to managers. Most front-line managers lean toward traditional practices, and hesitate to try recommendations from research — if they are even aware of research results. Moreover, they want discreet, definitive answers that can stand up to court challenges, while science works in terms of uncertainties, the continual refining of knowledge, and even occasional paradigm shifts that weaken the support for old prescriptions.<sup>26</sup> The agencies now find that re-negotiating the marriage of these two fundamental activities, and the two "cultures" of people that pursue them, can be quite difficult, especially where science has been alternatively ballyhooed and suppressed by managers in response to political moods (a case made particularly against the National Park Service).<sup>27</sup>

The second type of institution — less formal social features that guide individual behavior — increasingly figures in what has come to be called political ecology, the study of how the political economy affects the natural ecology.<sup>28</sup> The political ecologists allow that different perceptions, attitudes and values affect human interaction with ecosystems, but argue that structural factors, like differential access to resources, control of capital, land ownership and division practices, and other aspects of "social order" are more important determinants than individual preference and behavior. The first strains of political ecology were purely

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Management, volume 44, at p. 427; and Committee on Rangeland Classification, Rangeland Health: New Methods to Classify, Inventory, and Monitor Rangelands (Washington, DC: National Academy Press, 1994).

<sup>26</sup>See Wallace, Mary G. et al., "Asking the Right Questions: Integrating Social Science and Ecosystems Management," (unpublished paper, Aug. 3, 1995, on file with author) for excellent work on this and related institutional aspects of ecosystems management.

<sup>27</sup>Chase, Alston, *supra* note 6; Fromme, M., Regreening the National Parks (Tucson: University of Arizona Press, 1992).

<sup>28</sup>Blaikie, Piers and Harold Brookfield, Land Degradation and Society (London: Routledge, 1987); Emel, J. and R. Peet, "Resource Management and Natural Hazards," in Peet, R. and N. Thrift (eds.), New Models in Geography, Vol One, at p. 49 (London: Unwin, 1989).

Marxist, or had strong Marxian overtones (e.g., historian Donald Worster's critique of agricultural development of the U.S. Great Plains), and these threads are still part of the sub-discipline, but the focus on inquiry and critique enlarged as themes not linked to Marxist political theory were sounded forcefully: e.g., feminism, consumerism, ethnic pluralism and others. Still, the traditional Marxist themes endure for good reason: land tenure, access to the means of producing resources, and relationships between land owners, tenants, and capital play a critical role in all land based societies — no less so in the western U.S. than, say, Latin America or sub-Saharan Africa, the traditional stomping grounds of the political ecologists. In such places, political ecologists have been able to demonstrate quite convincingly that colonial and post-colonial changes in agriculture and access to land made many people especially vulnerable to disruption. The Sahelian drought didn't cause famine, rather, weakened social structures caused famine. In the Amazon, political ecologists have traced the complex relationships among peasant behavior, class, state politics, land tenure, and international aid and capital, and have shown how they conspire to cause tropical deforestation and cultural degradation. The evidence seems to rather easily prove their point that political and economic structures — conceived in purely social terms and metaphors, not in organic analogies — must be considered in explaining any environmental problem.<sup>29</sup>

An important survey of institutional ecologies (not, by the way, labeled political ecology, but rather the more traditional "political economy") is offered in Elinor Ostrom's Governing the Commons: The Evolution of Institutions for Collective Action.<sup>30</sup> Because she focuses almost exclusively on natural resources like water and forests (and not on some other "commons," like national security) the work is something of a bible of institutional arrangements for sustainable land management; many of her cases are in institutional contexts similar to the western U.S. public lands. Rather than discuss her major points here, I apply them to the federal rangelands case described later.

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<sup>29</sup>See, on the African Sahel: Watts, M., Silent Violence: Food, Famine and Peasantry in Northern Nigeria (Berkeley: University of California Press, 1983). The Amazonia case is made by Hecht, S.B. and A. Cockburn, The Fate of the Forests: Developers, Destroyers and Defenders of the Amazon (London: Verson, 1989).

<sup>30</sup>Ostrom, Elinor, Governing the Commons: The Evolution of Institutions for Collective Action (New York: Cambridge University Press, 1990).

## Lessons from the Ecological Sub-Disciplines

This brief literature review hardly scratches the surface of relevant material, but does suggest what we can expect to learn from ecology-oriented social science. First, a large body of work exists to support the notion that traditional societies were indeed better attuned to nature and managed to achieve sustainable people/land relationships, despite some revisionist takes on this argument (e.g., geographer William Denevan's argument that Native Americans not only degraded natural ecosystems but were poised to have an even larger impact through population growth on the eve of European arrival).<sup>31</sup> Unfortunately, the critics are probably right in arguing that the cultural and political ecology focus on pre-industrial, small-scale societies offers little insight into a modern and post-modern world except that traditional adaptations might be worked into the modern roster (the same is said by almost every environmentalist to date; Stegner especially argued that modern westerners needed to adapt to the region's environment in ways more akin to how indigenous plants, animals, and people did). The political ecologists perhaps have more to offer by bridging the gaps between individuals or single cultures and global geopolitics and economy, but they too tend to offer only one prescription: more local communitarian control and "traditional" resource management.

Perhaps a more telling lesson from political ecology useful to the Natural Resources Law Center's Western Lands Sustainability Project is that "commons" are not necessarily to be avoided (see Ostrom, discussed below), nor is it likely that there ever existed cases of the near-complete social normlessness implied by Hardin.<sup>32</sup> Moreover, most political ecology (perhaps due to its Marxist beginnings) finds that private property and capitalistic land use systems degrade people and ecosystems, though few researchers have clear prescriptions for alternative arrangements.

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<sup>31</sup>Denevan, William M., "The Pristine Myth: the Landscape of the Americas in 1492," Annals of the Association of American Geographers, volume 82, at p. 369 (1992).

<sup>32</sup>Hardin, Garrett, "The Tragedy of the Commons," Science, volume 162, at p. 1243 (1968).

## Case: The Political Ecology of Rangeland Reform

The issue of federal range policy nicely illustrates the coalescence of cultural-, human-, and political-ecological factors, and encompasses a possible sea change in the way that environmental policy is made and implemented. The Clinton Administration's initial move to reform federal grazing policy — called "Rangeland Reform '94"<sup>33</sup> — was temporarily stymied by the now common tactics of multiple special interests: livestock and environmental organizations stalemated each other with intense lobbying, western senators filibustered Department of Interior (DOI) appropriations, and politicians of all types, according to some accounts, held other issues, like free trade, hostage to the longstanding, parochial fear of change among private users of federal lands.<sup>34</sup> A few interest groups, however, were in a position to respond with a more novel tactic: collaboration. Some environmentalists and ranchers had formed alliances in the West, especially where they faced common threats like land development and water transfers, and though they too disliked the top-down structure of range reformation, some groups began to offer alternatives. One of these, the Colorado Resource Round-Table, had been meeting for two years when Governor Roy Romer asked it to form the core of a task force to create an alternative to DOI's reform proposal.<sup>35</sup> The result was the so-called "Colorado Model," which espoused a more local, collaborative federal range management.

The Colorado model did not come about easily; most of the same issues argued nationally appeared during the group's weekly meetings during winter 1993-94. The issues

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<sup>33</sup>The Clinton Administration's campaign to reform federal lands grazing was officially born in the Federal Register on August 13, 1993 (58 CFR 43208). A modified proposal appeared in the Federal Register on March 25, 1994 (43 CFR Parts 4, 1780, and 4100). The draft environmental impact statement (DEIS) was issued in April, 1994. The final reformed regulations were published as "Final Rule, 43 CFR Parts 1780 and 4100" in the Federal Register, February 22, 1995. The Department of Interior refers to the entire process as "Range Reform '94," a convention also used in this article.

<sup>34</sup>After several setbacks, Interior implemented new range management regulations in August, 1995. But, the Republican-dominated Congress has promised to roll back this regulatory reform through appropriations mechanisms, and Sen. Pete Domenici (R-NM) has introduced legislation to replace Babbitt's regulatory reforms with something very similar to the system established by the Taylor Grazing Act.

<sup>35</sup>I am secretary of the roundtable and was a member of the Governor's task force, so this is something of a study by "participant observation."

can be framed as problems of human, cultural and political ecology: 1) creating and enforcing rules of use that encourage resource sustainability; 2) the security of tenure awarded to users and 3) defining, assessing, and achieving rangeland ecosystem health.

### People in Rangeland Ecosystems

Rangeland pastoralism is an ancient resource system in which humans use grazing animals to convert vegetation to meat, blood, milk and other products.<sup>36</sup> The pastoral system that developed with European settlement of the western United States combined institutions from elsewhere (Spanish ranch structure) and indigenous adaptations to the West's ecological and political conditions. Ranchers found that they needed huge land areas to raise cattle and sheep — land that they could not afford to purchase nor share with other livestock owners. In response they created, with little government participation, an informal allocation of large public tracts linked to relatively small homesteaded lands.<sup>37</sup> Ranchers either assumed that they would eventually obtain title to the rangelands under their control, or that extra-governmental arrangements would provide sufficiently secure tenure indefinitely.

Two social shifts, roughly a half-century apart, undermined this security. First, customary rangeland use evolved just as Americans were re-thinking the logic of transferring public lands to private ownership. By the early-1900s, it was obvious that the remaining public domain would not be so unquestioningly disposed of. The resulting awkward pattern of private grazing use of public lands was codified in the 1934 Taylor Grazing Act.

Second, the notion that resources, private or public, should be developed to create a robust economy was widely questioned starting in the 1960s, when environmentalist arguments for protecting and preserving nature received sufficient public support to affect

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<sup>36</sup>The status of pastoral systems around the world is assessed in Galaty, John G. and Douglas L. Johnson, The World of Pastoralism: Herding Systems in Comparative Perspective (New York: The Guilford Press, 1990). One finding of this survey is that grazing systems everywhere are changing due to political, land use, and economic pressures.

<sup>37</sup>This pre-federal allocation of rangeland is widely viewed as an ecological and social mistake; see Ferguson D. and N. Ferguson, Sacred Cows at the Public Trough (Bend, OR: Maverick Publications, 1983), but see Hess, Karl Y., Visions Upon the Land: Man and Nature on the Western Range (Washington, DC: Island Press, 1992), where it is implied that it might have been sustainable had the federal government not imposed an inappropriate agrarian vision onto the informal system.

policy. Resource policies then tilted toward environmental values (clean water, wildlife, recreation, wilderness), with increased restrictions on extractive uses. The current battle among rangeland stakeholders, especially between ranchers and environmentalists, however, indicates that these adjustments were insufficient to adapt the system to changing social values.

### **Embedding the New Political Ecology Into Rangelands**

The sustainability of public lands grazing ultimately rests on two somewhat contradictory social principles: renewable public resources should be put to private beneficial use in a fair and equitable manner, but that use must maintain the ecological well-being of the resource for other (often more public) values like water quality, biodiversity, and aesthetics. The Colorado task force made some progress on "use" issues (e.g., who could have permits), but simply could not arrive at a common notion of ecological health. Thus progress was slow on regulatory details — such as land suitability, conservation use, and water development — that rest on perceptions of ecosystem well-being.

Some of our floundering was surely due to the conceptual confusion of range science, which cannot seem to specify what constitutes ecological health and has spent decades pursuing different and contradictory approaches to measuring range status. But the failure to communicate also stemmed from bedrock values. We came upon, I believe, the great rift between our notions of the correct role of humans in nature and our concept of "nature" itself. Our descent into contentious confusion was especially counter-productive in one almost night-long meeting, that I organized and chaired, meant to help the group recommend "standards and guidelines" for rangeland health.

Several arguments raised that evening, and peppered throughout the other meetings, point tellingly to very different norms of people/ecosystem relationships. Ranchers, right from the start, argued that "humans are part of ecosystems" and that standards and guidelines must thus support human community health as well as ecological health. Community health meant more jobs, an even stronger range-based economy, and overall economic and population growth. They also argued that their "customs and cultures" represented a national treasure to be protected along with ecosystems, and even that their customary use could be

likened to the adapted use by traditional peoples and other grazing wildlife.

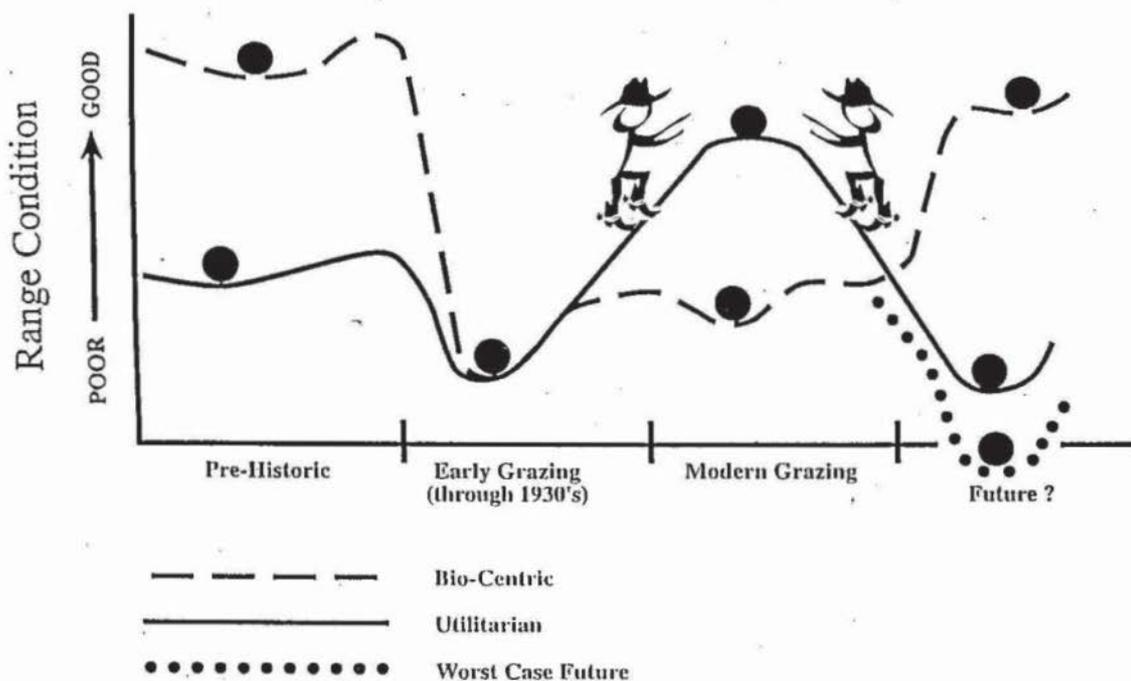
Environmentalists saw this argument as anathema to the real question: how much resource extraction are humans willing to forego, and how much additional investment are they willing to make, to maintain critical elements of range ecosystems not directly or obviously beneficial to humans, like predators or songbirds? By midnight we had not managed to bridge the gulf between these utilitarian-anthropocentric and environmental-naturalistic modes of thinking.

Another very old argument dogged our discussions of issues like conservation use (voluntary allotment de-stocking for ecological reasons) and water development. On conservation use, for instance, the utilitarian view held that human intervention was generally good and even necessary to maintain healthy rangeland, an argument linked to the notion that since we have already altered the western ecology, we must continue to intervene to keep it functioning (e.g., other grazing animals are gone, so we should keep domestic ones on the range because the grass must be grazed to be healthy). In this vein, environmentalist notions that nature is best left as much alone as possible seem quaint and ill-informed.

I have tried to illustrate this debate as two different "environmental histories" of the western range (Figure 1). The diagram uses a "cup and ball" approach to displaying the stability or instability of an ecosystem as it is buffeted by various perturbations (e.g., grazing, fire, drought, etc., as described in work by William Laycock, cited at footnote 25). Both sides allowed that the range was in poor condition at roughly the turn of the century, when bad management obviously degraded it. But they did not agree on how to value pre-historic or "pristine" conditions, nor on how much modern practice had improved the range. Ranchers counted many modern approaches as having actually improved on pristine nature, while environmentalists, of course, applying a strict naturalistic standard, were less certain. We could not even thus agree on whether people are now a positive or negative force with regard to range quality.

Here then, briefly outlined, is the great perceptual divide that separates ecocentric from utilitarian views of the people/ecosystem relationship. Both groups may claim to be environmentalists, but the roots of modern environmentalism lie in the belief that humans

**Figure 1.** Competing views of the evolution of western range condition over time, illustrated as a ball (range condition) on a surface of hills and troughs that represent either stable (troughs) or unstable (hills) ecosystem status. Modern grazing is seen, in the utilitarian view, as maintaining good range condition through human management (the two cowboys holding the ball up), while biocentrists see modern conditions as improved from early-twentieth century abuse but still degraded from its pristine state. Biocentrists believe that release from grazing would restore something near pristine quality, while ranchers fear that total destocking would push rangelands into an ecologically degraded state.



have gone too far in transforming ecosystems to their utility, and must amend that lust to live within natural limits. Yes, a pinon-juniper woodland does not produce as much forage as a grassland, but the woodland is a part of necessary ecosystem integrity that should be respected for what it is; use it within limits, but do not transform it fundamentally.

### Getting the Political Ecology Right

Most of the Colorado discussions were on detailed rules and regulations of rangeland use, and it is here that a more prescriptive, academic approach to the people/rangeland issue might usefully apply principles of cultural and political ecology. Historian Donald Worster argued that:

We need a full ecological history of American range management, one that goes beyond the narrow matters that most range technicians seem to know and care about, one that is alert to all the effects of various tenure systems and to all the socio-ecological regulatory systems of other cultures.<sup>38</sup>

Fortunately, studies of other agricultural systems point to institutional structures that, in one part of the world or another, have allowed systems very much like American public lands grazing to maintain both social and ecological sustainability. Unfortunately, the U.S. grazing policy process has lacked historical perspective and has been focused solely on the American experience.<sup>39</sup>

Based on her survey of common property resource systems around the world, Elinor Ostrom identified several political-economic-ecologic elements that appear repeatedly in apparently sustainable grazing, farming, and agro-forestry systems, both ancient and modern.<sup>40</sup> Three that especially apply to the western U.S. grazing scene are:

- 1) clear rules for resource use, supported by the users, and strictly and equitably enforced;

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<sup>38</sup>Worster, Donald, "Cowboy Ecology," Under Western Skies: Nature and History in the American West, *supra* note 10, at p. 34.

<sup>39</sup>Secretary of Interior Babbitt, however, has frequently expressed a sense that history should guide us to new institutions in grazing and other resource uses.

<sup>40</sup>Ostrom, Elinor, *supra* note 30.

- 2) initial security of tenure so that the individual user has reason to expect that his/her long-term well-being is tied to long-term resource quality; and
- 3) recognition of environmental limits and carrying capacities reflected in rules for use.

An example comes from anthropologist Robert Netting, who found all of these features in communal high-elevation grazing systems in Switzerland — systems that avoided overgrazing for centuries despite environmental marginality and increasing population.<sup>41</sup> Cattle owners had developed agreed-upon rules of use that kept the pastures healthy, and they enjoyed secure access linked to property ownership. This security, however, did not supersede strict enforcement of grazing rules by an elected board. Netting also found that users held a shared, and frequently articulated, sense of the carrying capacity of communal pastures.

What is the potential for incorporating these elements into federal grazing policy?

#### Creating and Enforcing Rules of Use

Rangeland Reform '94 was a tilt toward greater enforcement and restrictions on ranchers. The original proposal evinced the standard assumption among environmentalists that improved rangeland health would come from stricter enforcement and new rules and penalties aimed at getting the minority of bad land managers to "do the right thing." But Ostrom's survey suggests that the most enduring farming and grazing systems around the world involve collaborative rule-making, efficient dispute resolution mechanisms, and rights to devise local institutions that "are not challenged by external government authorities."<sup>42</sup>

Enforcement mechanisms differ among cultures. Irrigation collectives in the Philippines elect one member as a "maestro" who then enforces water allocation rules that the group itself formulates. The Huerta irrigation societies in Valencia (Spain), founded in 1435, hire outside "ditch-riders" or judges to enforce use rules; they are paid with the penalties they

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<sup>41</sup>Netting, R. McC., Balancing on an Alp (Cambridge University Press, 1981).

<sup>42</sup>See Ostrom, *supra* note 33.

collect.<sup>43</sup> Access to Middle Eastern hima common grazing lands was carefully controlled by tribal law and strong group solidarity balanced by inter-group agreements — with occasionally violent clashes when those agreements were violated. Hima strictures were incorporated into Islamic law by A.D. 1000, and stood until Middle Eastern and North African nations instituted land reforms in the 1960s. Many of these governments re-created the hima system in response to the land degradation that followed its dissolution.<sup>44</sup>

Such ethnographic studies tend to value local institutions, a theme unappealing to environmental activists who believe that their best lever for environmental protection is at the federal level, but the studies do not necessarily recommend isolating rangeland use from the national scene. Galaty and Johnson's world survey of pastoral systems found similar locally-derived rules in longstanding grazing systems, but also found pastoral societies everywhere adjusting to pressure from larger political structures. The isolation of pastoralists may have also been over-stated in the studies cited by Ostrom and Netting, and even nomadic groups had elaborate connections with national political structures, which were counted on to protect their land tenure. Isolation is not necessary to sustainability, though special care is needed in allocating authority to different levels of society.

Worster argued that "the most stable systems of grazing have been those in which the experience, knowledge, and moral pressure of a whole community guided the individual grazer."<sup>45</sup> Similarly, the ranchers and environmentalists of the Colorado Task Force reviewing DOI's first reform proposals concluded that more local, collaborative approaches would bring a different type of pressure to bear on grazers to do right by range ecosystems; many of their ideas were incorporated into DOI's final rules — which are now being implemented despite congressional threats. The Colorado group argued for a "bottom-up, grassroots model" of local- and regional-scale collaborative groups with more authority in on-the-ground management decisions. The group carefully distinguished this from "local control"

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<sup>43</sup>Keesing, F.M., The Ethnohistory of Northern Luzon (Stanford University Press, 1962).

<sup>44</sup>Shoup, John, "The Middle Eastern Sheep Pastoralism and the Hima System," in Galaty, J.G. and D.M. Johnson (eds.), *supra* note 35, at p. 195.

<sup>45</sup>See Worster, Donald, *supra* note 38.

by special interests, arguing that community groups were legitimate only if they reflected the full spectrum of national rangeland interests. The Colorado and subsequent DOI proposals give greater management authority to western communities of interest, while recognizing the political reality of institutionalized interest group pluralism at the national level. Whether this will yield more socially sustainable processes remains to be seen, but the historical evidence supports experiments in this direction.

### Tenure Arrangements for Public Rangeland

A question intertwined with how to make and enforce grazing rules is the countervailing issue of the security of tenure given to permittees. A delicate balance of incentives and disincentives is called for in granting land tenure while simultaneously maintaining a credible threat that it will be revoked if behavioral norms are violated.

History indicates that incentives to "do the right thing" are as important as punitive disincentives. But environmentalists have approached rangeland reform mostly with the goal of tightening grazing regulation and oversight (see, for example, Johanna Wald, Ken Rait, Rose Strickland, and Joe Feller, How Not to be Cowed. Livestock Grazing on Public Lands: An Owner's Manual, an activists' guide published by the National Wildlife Federation). This seems a sensible posture given lax agency enforcement and past exclusion of non-grazing interests.<sup>46</sup> But, the historical evidence suggests that disincentives should not be applied indiscriminately to all policy elements; in particular, penalties for improper use — which must be strictly and equitably applied — should not be insinuated into initial permit security. Instead, normal permit tenure should be an incentive for good management, tying the individual's future well-being to the land's well-being. Even the current ten year permit period is short in terms of ecosystem management, and reducing it to five, or fewer, years as some groups have proposed, could hamper long-term planning. Environmentalists should argue for both strong enforcement and secure tenure: bad land managers should lose their access, and ranchers with good records should have very secure permit tenure.

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<sup>46</sup>Feller, Joseph M., "Grazing Management on the Public Lands: Opening the Process to Public Participation," Land and Water Law Review, volume 26, at p. 571 (1992).

Long-term care for land quality requires security of access. Low-security, tenant farming arrangements in early Great Plains agriculture contributed to the 1930s "Dust Bowl," and a worldwide survey of contemporary, mostly Third World, resource systems concludes that political structures reducing security of tenure on the land tend to encourage resource degradation.<sup>47</sup>

The positive relationship between tenure and resource stewardship relies on institutions that take advantage, in Ostrom's words, of a "prudent, long-term self-interest" that reinforces "norms of proper behavior." How do we elicit this self-interest on public rangelands, while simultaneously increasing enforcement of grazing rules? Reform advocates often lean toward one side or the other. Some recommend market-like mechanisms giving permittees tenure tantamount to private property rights; others suggest increasing the permit period as an incentive for conservation and creating mechanisms for ranchers to capture benefits from other land uses (e.g., hunting income). Two reform-minded range scientists, Jerry Holecheck and Karl Hess, conclude that the federal rangeland grazing system is needlessly costly, adversarial and inefficient, and that it encourages over-stocking of the range.<sup>48</sup> They propose to allow permit holders to manage the land for other uses desired by the American public, like improved fisheries, and want the government to create a market in which public lands ranchers can voluntarily sell their grazing permits. Anti-grazing interests could then, if they wish, simply purchase and retire the permits, while simultaneously compensating the rancher for his or her investment and loss of grazing access. Although implying that public land grazing permits are equivalent to a property right, such market schemes could break the political deadlock between grazing critics and proponents.

### Defining the Environmental Limits to Grazing

The third essential element of resource sustainability is some agreed-upon sense of natural limits. Unfortunately, the standards and guidelines for ecosystem health emerging in

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<sup>47</sup>Blaikie, Piers, and Harold Brookfield, *supra* note 28.

<sup>48</sup>Holecheck, Jerry L. and Karl Hess, "Free Market Policy for Public Land Grazing," Rangelands, volume 16, at p. 2 (1994).

DOI's reform package will do little to help diverse rangeland interests develop a shared perception of range ecology. The Colorado Group's discussions, perhaps the most detailed and earnest of any such multiple-interest group in recent times, barely scratched the surface of rangeland condition and ecosystem definitions, yet revealed a mine field of unexamined notions about nature and the correct role of humans in the western landscape.

For example, some of the panelists argued that because "humans are part of ecosystems," standards and guidelines must support social well-being by protecting their access to forage. Environmentalists worry that anthropocentric definitions of ecosystems engender a disregard for elements not directly beneficial to humans but still necessary for ecosystem health.

Policy elements like conservation use (voluntary de-stocking for ecological reasons) and water development evoke conflicting perceptions. Again, the anthropocentric view, on conservation use, for instance, holds that human intervention is generally good and even necessary to maintain healthy rangelands which evolved under grazing pressure. Arguments over water development reveal the even more basic value that humans have an obligation to improve on nature, by, for instance, developing water sources where none previously existed. The environmentalist response is obvious: dry hill slopes and small seeps are best left as is, while artificial impoundments attract animals to places where they would not normally gather, placing unnatural pressure on the ecology.

The great divide between human use-oriented and biocentric views of rangeland ecosystems complicates efforts to create collaborative visions for western landscapes. Modern environmentalism is based on the belief that humans have gone too far in transforming nature, and must start to live within natural limits. Ranchers argue that human society is part of rangeland ecosystems, and that people have the right, even the moral obligation, to improve their lives by transforming nature. The difficulty of bridging this gap in values and perceptions will interfere with progress on other elements of rangeland reform. Recognizing this, the Colorado group called for a major educational component to rangeland reform, and even spun-off a continuing committee to create a model curriculum that would give all rangeland interests some common base for coming to terms with their different perceptions of range ecosystems.

Thus, the sub-text to the current rangeland policy debate involves, I believe, enduring questions raised at the start of this paper: what is the correct relationship between environment and society, and are there limits to what people can and should do? Obviously, we must formulate rules and institutions that people support, and it is equally important to establish ecologically and socially sustainable goals for those institutions. Discourse on rangeland policy reform indicates great potential for creating new processes and institutions, and history offers valuable guidelines. But common notions of ecosystem health and sustainability that can be encoded in standards and guidelines for use of western public lands will not come easily, I believe, because the reform process does not include a mechanism for exploring and reconciling different perceptions of ecological sustainability: a West-wide effort to define ecosystem health, and the appropriate human role in ecological function, is needed.

### **Embedding People in Ecosystems: Coordination, Collaboration and Community**

Are we ready to move toward an authentic, socially-relevant ecosystems management? No. The Rangeland Reform debates reveal that we are as divided as ever over just what an ecosystem is, and have not yet even found words or useful metaphors to carry on the much needed public discussion on ecosystem health.

Despite this, we should try to engage in meaningful dialogue about ecosystem and land use sustainability. And I believe that we stand a better chance of getting a productive conversation going by accepting the lay argument that "people are part of ecosystems," and then sorting out "what part," and how that role needs to change to deal with current realities on the ground (e.g., rapid development of private lands in the West, grid-lock over the public lands). Anecdotal experience (of almost any land manager) and social science research tell us that any approach to ecosystems management, multiple-use, preservation, or restoration simply cannot succeed unless it is embedded in a supportive "social ecology." Our notion of "landscape" must include the social landscape (land ownership, environmental perceptions, the map of interest groups), and efforts to sustain ecosystems must include sustaining human communities — even if those communities extract a living from those ecosystems — an

argument that makes more strident environmentalists and purist conservation biologists nervous.

Integration of social and ecosystem elements in western land management will not come easily, I believe, because "the people" are widely disenchanting with and disenfranchising from public land policy. That is, I agree with Robert Nelson's diagnosis of institutionalized sclerosis, but not with most of his prescriptions, which focus on privatization. Rather, I count the public lands as one of our few remaining shots at redemption as a functional democracy and as an empathetic, responsive, and caring people with a sense of, and opportunity to find and create, the common good in land use. Few social contexts challenge us to address abiding ecological and social questions in the public sphere and in a collaborative way as do the western public lands.

How might we apply insights accumulated in the social ecological fields, along with lessons of the rangeland policy case, to creating more sustainable people/ecosystem relationships on the ground in the West? My sense of the social ecological literature is that there is no overarching common prescription for environmental conservation, but that one can discern a constellation of social arrangements at different scales that might, on balance, tend to result in greater care for resource sustainability and, to a lesser extent, a fuller range of ecosystem values. Ostrom's three elements of resource sustainability are certainly part of this constellation, but they are insufficient to answer the many questions of western land management: Should we create property-like tenure arrangements for most lands and resources? Can de-centralized, collaborative management serve both local and national interests in western lands? Might we pay people from some form of ecosystem trust fund to preserve species? Can we identify and abolish subsidies that work against ecosystem health?

Two weaknesses underlie the poor state of discussion on ecosystems and people. First, we do not have sufficient appropriate forums for getting the insights of social science examined and applied. Second, we have not engaged in a sufficiently inclusive public discussion of ecosystems and land sustainability. We must embed people into ecosystems — politically, analytically, and literally. Our overarching posture should be initially to welcome and encourage a wide range of perspectives, values, attitudes, and arguments, to revel in a

pluralism of definitions which can become the basis for an extended regional and national debate about ecosystems and people, focused specifically on the public lands.

Since it would appear that the consent of stakeholders is needed to achieve any lasting western land policy, I propose that we hold ourselves to a criteria of total "informed consent." Equal attention must be paid to both elements of this policy: the process of informing, educating and canvassing people's perceptions and understandings of ecosystems, and the process of getting their consent — and support — for management goals and actions. I take consent to mean something similar to consensus, in the sense that all stakeholders should be agreed to the policy or action (e.g., wolf reintroduction). This criterion will be a harsh taskmaster, which many conservation biologists and environmentalists would assume simply negates any chance of protecting non-economic species or habitats. But it has the valuable trait that, once met, the resulting land management policies are then almost self-implementing, and probably socially sustainable.

Perhaps the most difficult aspect of informed collaboration is the tension between local and national interests. Despite Ostrom's argument that common property groups need dispensation to work things out for themselves, we cannot at this point in American history deny national attention and interest. I believe that getting a better handle on social scale is the great challenge for further analysis of people/ecosystem relationships.