WESTERN LANDOWNERS ALLIANCE
STEWARDSHIP WITH VISION

Conservation Economics on Western Working Lands

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Introduction

Conservation is a Form of Economics

A broad range of motivations has made conservation a perennial American interest, from Thoreau's romantic yearning "to know an entire heaven and an entire earth" to Pinchot's utilitarian "greatest good of the greatest number over the longest time." But what is conservation exactly? A straightforward definition might be found in a line from Aldo Leopold: "the oldest task in human history: to live on a piece of land without spoiling it."[1] For Leopold, conservation is a way of managing human affairs that maintains the biodiversity and ecological processes that are the basis of land health. Given that 'economics' comes from the ancient Greek *oikonomia* or "science of household management," it might be said that conservation is simply a kind of economics built to last.

People most commonly associate conservation with the setting aside of land in parks or wilderness, legally restricting certain forms of human use. On an increasingly crowded planet, however, even parks and wilderness cannot avoid being affected by human activities within and outside of the protected areas. Moreover, the need for wildlife to move with the seasons from one part of their range to another and to maintain genetic diversity in their populations illustrates the fundamental limitations associated with islands of protection. In the end, the living landscape is a whole and must be treated as such. In any case, there is ever less land to be set aside, and therefore conservation today must increasingly focus on supporting those kinds of economic activities compatible with ecological health, discouraging those that are not.

If the practice of conservation can simply be called stewardship, then stewardship is especially challenging for land managers in the western United States due to marginal productive capacity, a high degree of annual variability, intermingling of public and private jurisdictions and complex wildlife and recreational factors, as well as the pressures of rapid urbanization. The stewardship of western private lands, in particular, with their disproportionate water resources and wildlife habitat, is critically important in its own right and for the larger landscape. Unlike management that is based on agency budgets, private stewardship must support itself within the market economy, where landowners and managers are immersed in the daily tension between ecology and market forces. Theirs is an essential experiential perspective and the inspiration for establishing Western Landowners Alliance (WLA): to make working lands leadership the distinguishing phenomenon of the next era of western conservation. The task is to help stewardship better compete with its alternatives.

Even apart from the market economy, landowners encounter a surprising number of barriers in their efforts to implement sound stewardship and conservation, ranging from property tax policies to county land-use restrictions to water rights policies. For example, those seeking to restore forested watersheds may receive favorable property tax benefits for harvesting and selling commercial timber but not for out-of-pocket costs to remove small diameter, diseased or otherwise non-merchantable trees that most contribute to catastrophic fires. Landowners seeking to conserve water may risk losing water rights, and those who have sustained wildlife habitat and species on their land are at greater risk of regulatory restriction and demands for public access than those who have not. The more economically marginal and bureaucratically confounding it is to own and manage land, the more likely it is for a landowner to ignore or oppose legitimate public interests in the quality of natural resource management.

[1] Leopold, Aldo. "Engineering and Conservation" [1938]. In *The River of the Mother of God and Other Essays by Aldo Leopold,* Edited by Susan L. Flader and J. Baird Callicott, p. 254. Madison: University of Wisconsin Press, 1991.

Success to Build On

It is important from the outset to acknowledge significantly improved relationships since the early 1990s among agricultural and environmental constituencies in the West. Many NGOs (non-governmental organizations) have decided, for example, that well-managed grazing on intact working lands is one of those economic activities most compatible with their conservation goals and have supported such forms of land-use. The Sage Grouse Initiative has been a region-wide success story for voluntary, proactive and effective partnerships that have helped to conserve the sagebrush ecosystem and precluded potential listings under the Endangered Species Act (ESA). A particularly heartening development amidst increasing complexity and bureaucracy at higher levels of government has been the evolution of community-based conservation efforts.

At the scale of the individual watershed, citizens are working together with neighbors and stakeholders on a common vision for the landscape and collaborating to create the projects, systems and institutions necessary to adaptively manage natural resources. This progress is important first of all because it empowers local people to address those issues by which they are most concretely affected, and secondly because natural resource science increasingly indicates that adaptive, outcome-driven management is more effective than standardized practices and prescriptions. This success is exemplified by such well known organizations as Malpai Borderlands Group, Chama Peak Land Alliance, Blackfoot Challenge and The Big Hole Watershed Committee.

Overall, improved relationships across the western landscape have supported the recovery of the gray wolf, led to a potential delisting of the Yellowstone grizzly and maintained intact ungulate migrations that still keep rhythm with the seasons. Many ranchers will verify that the abundance of certain wildlife populations in today's West far outpaces what previous generations of their families had known on the same lands.

The Economic Growth Paradigm

Despite these important gains, the specter of a diminished West advances apace. Even as the Montana Land Reliance, for example, has placed 1 million Montana acres under easement since its establishment in 1978, commercial development has taken 1.5 million of the state's natural acres since only 1990. West-wide, over 200,000 natural acres per year are lost to the same. According to World Wildlife Fund, approximately 3.7 million acres of native prairie have been converted by the plow since only 2011[2], and the risks to wildlife and water from ill-conceived or poorly planned energy development are ubiquitous.

At the very largest scale, the Global Footprint Network estimates that the world economy is exceeding the planet's capacities to supply its inputs and assimilate its wastes by a factor of 1.7 (i.e. 1.7 planets would be required to sustain the current global economy). Furthermore, if the rest of the world used resources at the rate of the U.S., more than five planets would be required. Today, human demands are exceeding the limits of the biosphere, changing the climate, altering its fundamental nitrogen and phosphorus cycles and crowding out biodiversity at between 1,000-10,000 times the natural extinction rate.[3]

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[2] Nancy Labbe. "Nancy Labbe: Congress should provide protections for grasslands," *Daily Camera*. Aug. 28, 2018. http://www.dailycamera.com/guest-opinions/ci_32101165/nancy-labbe-congress-should-provide-protections-grasslands

[3] Chivian, E. and A. Bernstein (eds.) *Sustaining life: How human health depends on biodiversity.* Center for Health and the Global Environment. New York: Oxford University Press, 2008.

Meanwhile, Americans stumble through this "era of megafires" grasping for the political sanity necessary to take responsibility for western forests, recover endangered species and reclaim a national land ethic that only in 1973 provided nearly unanimous bipartisan support for the conservation of biodiversity and habitat in the form of the Endangered Species Act. Yet society was then, and remains today, unaware of or unwilling to alter the fundamental economic paradigm and practices that jeopardize biodiversity in the first place. Changing this paradigm should be the keen focus of conservation moving forward.

Perhaps the most common sentiment expressed by excellent land managers, when asked about the economic trends shaping the West, is that the importance of stewardship is simply not understood or valued by society. Perhaps it should not be surprising, then, that mainstream economic theory does not account for land stewardship because ecology is simply left out of consideration. Textbook economics imagines the man-made economy in a vacuum, where raw materials and energy inputs are unlimited and waste outputs are either assumed to be negligible or to flow somewhere "off the textbook page." However, as the economy grows, it is increasingly impossible to ignore the limits of the Earth's ecosystem, in which the economy is of course embedded, as the figure below from Dr. Kate Raworth illustrates[4]:

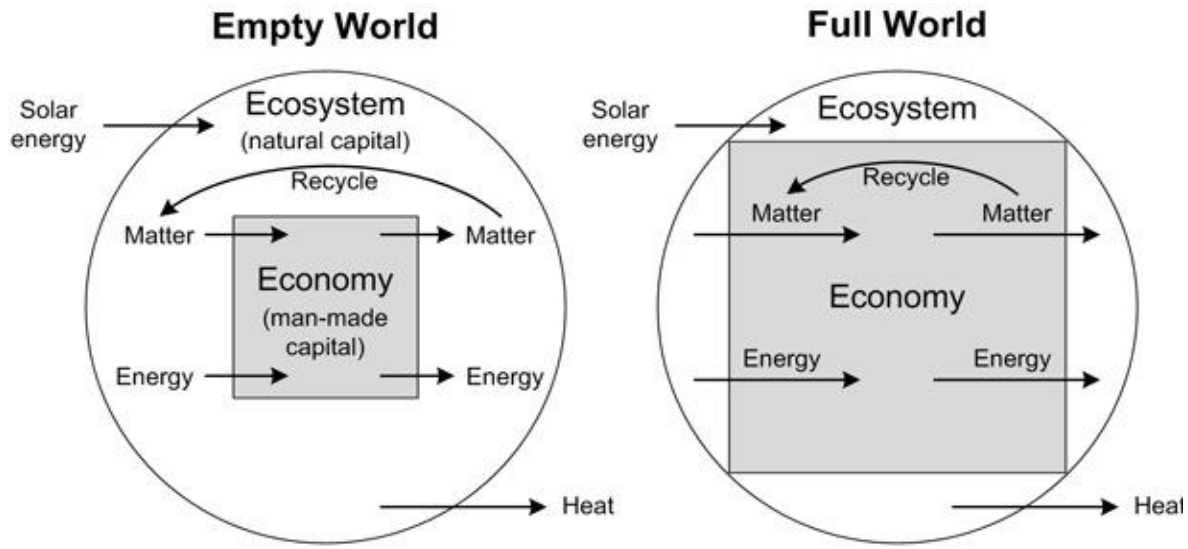

Figure 1: Limits to Growth.

Since the prices of goods and services do not convey information to the consumer about the ecological costs or benefits associated with their production, such externalities are simply left out of account by the market economy. The agricultural community, for example, often responds to questions about the environmental sustainability of its practices by stating that ranchers and farmers would not still be in business if they had been using the land unsustainably. In the very long term, assuming people were primarily making their living from the land, this would be true since abused land will not maintain its productivity. However, without having to count the ecological costs of

[4] Kate Raworth. "Economic pluralism, yes – but don't ignore the planet," *Kate Raworth, Exploring Doughnut Economics*. May 23, 2014. https://www.kateraworth.com/2014/05/23/pluralism/.

production, forms of land abuse easily persist long enough to draw down stocks of natural capital and cause irreversible degradation in the short and medium term, while destabilizing operations that are practicing stewardship. If land degradation is an example of a negative externality, there are also positive externalities which the market also fails to take into account. In the West, one example of this is the habitat that private lands and landowners provide to wildlife, at significant cost to themselves, often at no charge to the public. Additional examples that Raworth and others point to include childcare and caregiving for the elderly, services that in much of the world are provided—mostly by women—outside of the market economy.

The principle of substitution in textbook economics assumes that if a given input to the economy becomes prohibitively scarce or expensive, innovation will find an acceptable replacement. However, substitutes for fresh water, or soil, or biodiversity, for example, have not been found. More significantly still, the capacity of the land to act as a sink that assimilates and transforms human wastes is being severely strained. Today, economic wastes (e.g. greenhouse gases (GHGs), nutrient runoff, etc.) are altering the fundamental processes that are the basis for a hospitable climate and fertile land. The faith that human cleverness and innovation will always find an acceptable substitute, even for the essential and limited natural resources mentioned above, seems a treacherous leap indeed, especially considering the already available alternative to simply incorporate ecology into economic thinking.

In recent memory, economic growth has been presented as the goal of one administration after another in the U.S., as well as being the goal of most of the western world. It is a reliably popular political position because it assumes room for every person, no matter their current wealth, to improve his or her financial position without limitation. Since textbook economics leaves the biosphere out of consideration altogether, there has been nothing to call the notion of unlimited economic growth into question. However, taking into account natural limits forces the conclusion that an economy based on growth must eventually burst the seams of the biosphere. At a time when more than a billion people still need growth to escape deep poverty, aggregate growth is not a viable option and therefore a more equitable distribution of wealth is essential.

To illustrate the goal of an economic paradigm designed from the outset to account for ecological limits and social justice, economist Kate Raworth proposes the image in Figure 2 below from her book *Doughnut Economics: Seven Ways to Think Like a Twenty-First Century Economist*.[5] The inner ring of the "doughnut" represents those populations in need of growth to reach basic quality of life, while the outer reaches signify economic activity that must be reined in and the middle green ring represents a sustainable range of economic activity. Raworth's image provides an excellent "north star" for society and for working lands conservation moving forward. Meanwhile, landowners who continue to voluntarily balance this year's production with considerations for long term ecological health and who are working to leave the land better than they found it are under more pressure than ever. If their stewardship is going to be emulated at scale, fundamental economic changes will be required.

[5] Raworth, Kate. *Doughnut Economics: Seven Ways to Think Like a 21st Century Economist*. Chelsea White River Junction: Chelsea Green Publishing, 2017.

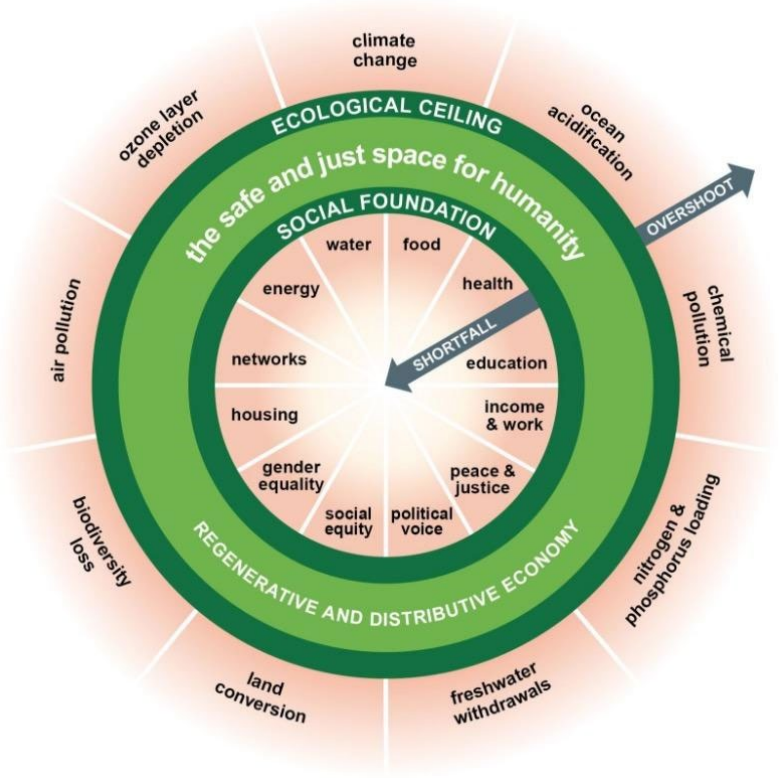

Figure 2: The Goal of Conservation Economics

Challenges for Working Lands Conservation

Agricultural Trends

Like the U.S. economy as a whole, the agricultural industry has been focused on increasing productive efficiency and expanding markets for most of its history. It has been very successful in this, as is clearly illustrated in Figure 3, provided by the USDA Economic Research Service.[6] As productivity has increased, the amount of labor supported by each unit of agricultural production has steadily decreased while every effort has been made to keep food prices low. A steady expansion in scale has therefore been necessary for farmers to stay in business, as illustrated in Figure 4 below, which shows historical decreases in the total number of farms along with a corresponding increase in average farm size.[7]

[6] Wang, Sun Ling. "Agricultural Productivity in the U.S.; summary of recent findings," *United States Department of Agriculture Economic Research Service.* Oct. 10, 2017. https://www.ers.usda.gov/data-products/agricultural-productivity-in-the-us/summary-of-recent-findings/

[7] Dimitri, C., Effland, A. B., & Conklin, N. (2005). "The 20th century transformation of U.S. agriculture and farm policy," *U.S. Department of Agriculture Economic Research Service*. June 2005. https://ageconsearch.umn.edu/bitstream/59390/2/eib3.pdf.

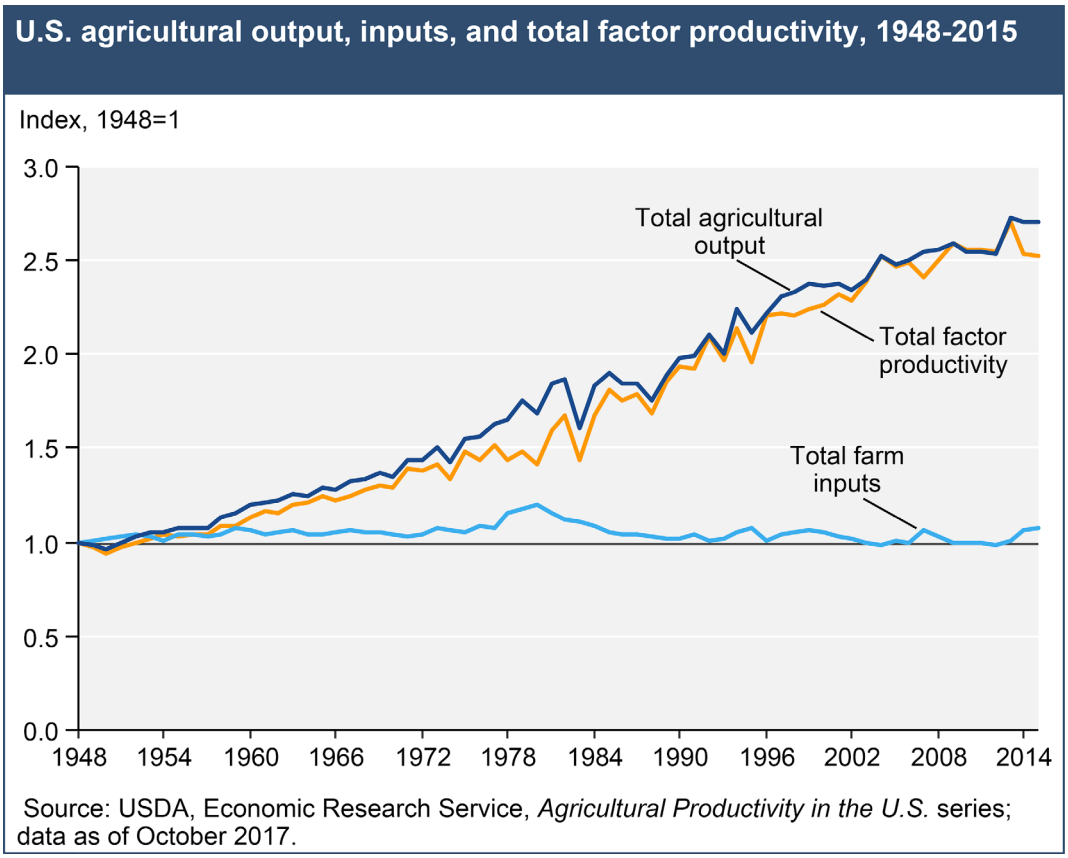

Figure 3: Historical Increase in Agricultural Productivity

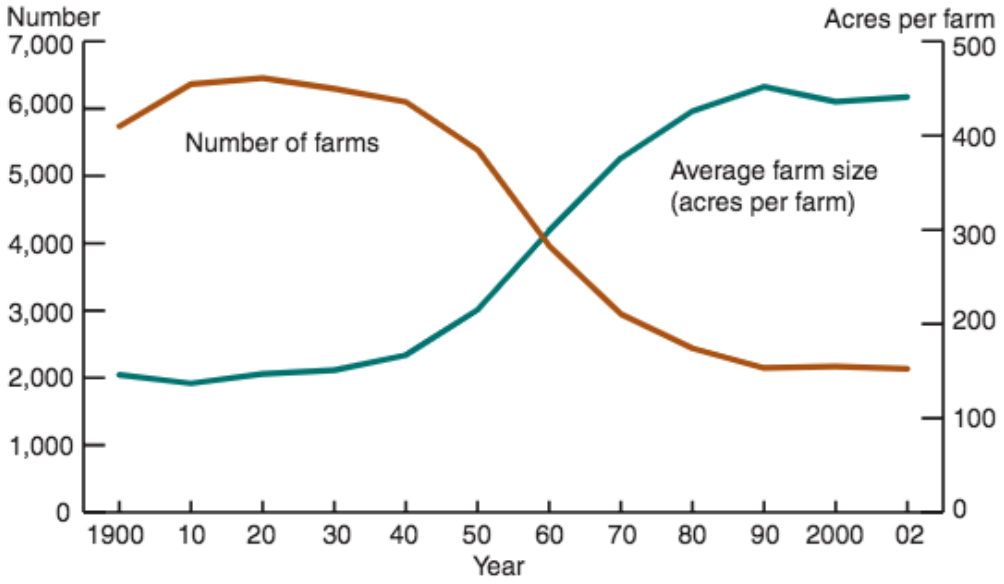

Figure 4: Increasing Scale of Agricultural Operations

Amidst ongoing farm consolidation, the next chart shows that the value of production has doubled over the long term while Net Farm Income (NFI)[8] remains relatively stagnant, since prices per unit of production have steadily decreased over time. Overall, the decline in number of farms and amount of on-farm employment, as well as stagnant NFI for owner operators, corresponds with widespread trends across all manufacturing sectors.

Real dollars comparison (in thousands)	1930-1950	2000-2017
Value of Production	$191,054,046	$385,635,609
Expenses	$102,319,527	$299,823,249
NFI	$88,734,519	$85,812,360

Source https://data.ers.usda.gov/reports.aspx?ID=17830

Table 1: Historical Trend in Net Farm Income

Agriculture, however, is unlike manufacturing in that it deals with living systems. Unfortunately, today there is ample and growing evidence that gains in productive efficiency made possible by one-dimensional reliance on the synthetic fertilizer, chemicals and seed technologies of the Green Revolution cannot be sustained. Consider a recent summation of the state of American agriculture from a book written in the Pentagon by Marine Captain, Colonel Mark "Puck" Mykleby and Navy Captain Wayne Porter, called *The New Grand Strategy: Restoring America's Prosperity, Security, and Sustainability in the 21st Century*:

> *... modern agriculture's negative effects are bad and worsening: nutrition is dropping, toxicity is rising, soils are being depleted, pollinators are dying off, carbon is being dumped into the atmosphere, water use is draining aquifers, runoff is polluting waterways, monocropping is decreasing resilience, and food distribution leaves major underserved groups hungry at the same time that 40 percent of food is going to waste.*[9]

Many of the efficiencies of the Green Revolution have proven false. Unaccounted for in the price of food and fiber, the tremendous ecological costs of U.S. agriculture have been accumulating and are being charged to the next generation.

Does this mean that there are no answers for feeding the approximately 10 billion people projected to share the planet by 2050? Fortunately, there are examples of farmers and ranchers putting diversity and resilience back into agriculture while producing yields competitive with industrial agriculture. Evidence for this can be found, for example, in The Rodale Institute's thirty-year *Farming Systems Trial* (FST), where results of alternative production systems for corn and soybeans ("organic manure," "organic legume" and "no-till") compared favorably with what the FST calls "conventional synthetic" agriculture.[10] Such examples are not exclusive to certified organic

[8] NFI is the return to farm operators for their labor, management, and capital, after all production expenses have been paid. It includes net income from farm production as well as net income attributed to the rental value of farm dwellings, the value of commodities consumed on the farm, depreciation, and inventory changes. Source: FPF Admin. "Farm Income Analysis: A Mixed Bag for U.S. Agriculture," *Farm Policy Facts*. Oct. 18, 2017. http://www.farmpolicyfacts.org/wp-content/uploads/2017/10/Farm-Income-Paper-101817.pdf

[9] Mykleby, Mark et al. "Regenerative Agriculture." Published in *The New Grand Strategy: Restoring America's Prosperity, Security, and Sustainability in the 21st Century*. St. Martin's Press, June 2016.

[10] Rodale Institute. "The Farming Systems Trial: Celebrating 30 Years," *The Rodale Institute*. Aug. 17, 2011. https://rodaleinstitute.org/wp-content/uploads/fst-30-year-report.pdf

agriculture and are being demonstrated by diverse people across different landscapes with a variety of production systems.

No matter whether these improved forms of agriculture are called "organic," "regenerative" or simply "sustainable," the common thread (in addition to the requisite knowledge, talent and skill) seems to be that working with living systems requires human observation and ongoing adaptation. In other words, stewardship is an art, difficult to capture in protocols and practices, that continues to lose its artists. Current policy and practices emphasize production efficiency without consideration for externalities, and farms are forced either to fragment into smaller operations unable to justify full-time labor and attention, or to double down on the labor-saving technologies that will allow them to expand operations and survive a little longer. As pointed out by emeritus South Dakota State agricultural economist Thomas Dobbs,

> *Both very large and small, part-time farms often are more conducive to specialized and capital intensive farming systems. Moderate sized farms, in which at least one family member can devote full-time attention to the farm, are best suited to the time requirements and complexities associated with ecologically integrated systems. Yet even moderate sized farms have less available family labor than in earlier eras.*[11]

If human time and attention are an essential component of stewardship, then it is fair to say that the economics of agriculture are justifying less and less stewardship per acre at a time when ever-greater demands are being placed on natural resources.

Another look at Table 1 shows that although farmers have become much more productive per acre, they have also been placing far greater assets at risk for the same stagnant return. Expenses tripled over the same period that value of production doubled, resulting in significantly decreased return on capital invested in production. In other words, the opportunity cost for capital invested in agricultural production continues to increase. Additionally, the rising value of land as an asset (not reflected in NFI), particularly in regions with high amenity value, presents a steep slope for anyone trying to finance new land acquisition or work through the tax consequences of passing it down intact to the next generation. This certainly helps to explain the increasing average age of farmers (currently 58) and the rural struggle to maintain the families and institutions that make a community.

The Economic Growth Paradigm in Food and Agriculture

As seen in the Rodale study mentioned above, it is encouraging that strong yields are being demonstrated by more sustainable agricultural practices. However, this should not obscure the fact that there are still limits to productive efficiency. Farmers know well that any given tract of land has a certain carrying capacity for crops and livestock determined and limited by complex factors including climate, water availability and biophysical characteristics of the soil. Better management and technology can improve efficiency to a point, but eventually an asymptote is reached. Unlimited growth is neither possible nor desirable; this is an essential point if society is to avoid an abrupt encounter with an even steeper productivity treadmill in 2050.

In fact, shortfalls in production have never been the primary challenge for U.S. farmers. Quite the opposite, crashing prices and volatile markets caused by commodity surpluses are more commonly

[11] Dobbs, Thomas L. *Economic and Policy Conditions Necessary to Foster Sustainable Farming and Food Systems: US Policies and Lessons from the European Union.* Presentation: National Academies Board on Agriculture and Natural Resources Study on Twenty-first Century Systems Agriculture. 2008.

to blame, as was the topic of *The Curse of American Agricultural Abundance* written by former Montana State University professor and advisor to President Kennedy, Willard Cochrane.[12] When increasing yield is the goal, efficiency of processing and distribution, as well as ongoing market expansion, are paramount. Any distinguishing elements of a product become barriers to commodification. Country of Origin Labeling (COOL) in the U.S., for example, was unsuccessful primarily because it threatened to decrease efficiencies for feeding and packing industries built on volume and free trade.

It is understandable that farmers resonate with the mission of "feeding the world." Of course, this is part of the essential role they play in society, and productivity remains important especially as intact land is lost to urban expansion and population grows. Yet, amidst big gains in agricultural productivity and the lowest food prices in the world (6.4 percent of U.S. household expenditures), hunger in the U.S. has increased since the 1960s when it was estimated that 1 in 16 children were hungry. By contrast, today it is estimated that 1 in 6 children are hungry.[13] Part of this increase in hunger can be attributed to a stricter definition of what counts as hunger, yet poverty, much more than food scarcity, tends to be the root cause of hunger. As *New York Times* columnist Mark Bittman put it in an address at the *Times'* "Food for Tomorrow" conference,

> *The way to feed the 9 billion is simple, eliminate poverty. The root issues of hunger are lack of equality and democracy, not lack of food supply. Hunger and malnutrition are not about agriculture, they're about economics … there isn't a shortage of food, and there isn't even a shortage of money, there's a shortage of equality. Pick the poorest place you can think of … put yourself there, look at yourself standing there. Are you going to be hungry in one of those places? Undoubtedly not, not for a minute. And what's the difference between you and the people who actually live there? … the difference is the wad of twenties you have in your pocket along with your credit cards.*[14]

If insufficient yield were the main obstacle to feeding people, agricultural trade organizations would not have to work so desperately to expand markets, 40 percent of the U.S. food supply would not be wasted as it currently is, and 40 percent of corn production would not be allocated to biofuels.

Nevertheless, U.S. antitrust law continues to use low food prices as the sole criteria for whether unacceptable concentration exists in the food industry, resulting in tremendous consolidation of power in food processing, distribution and retail grocery. In meat-packing, which has particular relevance to livestock operators in the West, 2011 statistics show up to 82 percent of the market controlled by four companies for certain products. The effect is to make agricultural producers more vulnerable by decreasing competition for their products and allowing an ever more powerful industry to further raise barriers to entry. One-size-fits-all food safety inspection regulations—perhaps necessary for very large scale but unnecessary and cost-prohibitive for moderate scale operations—are just one tactic.

Despite the publicity and excitement surrounding local foods in the U.S., and particularly for meat, there is a vast no man's land between the scale of the farmer's market and that of the super grocer,

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[12] Cochrane, Willard. *The Curse of American Agricultural Abundance: A Sustainable Solution*. Lincoln: University of Nebraska Lincoln Press, 2008.
[13] Tracie McMillan. "American Hunger, By the Numbers," *Civil Eats*. July 17, 2014. https://civileats.com/2014/07/17/american-hunger-by-the-numbers/
[14] Mark Bittman. "How to Change the Food System and Feed the Nine Billion," Presentation: Stone Barns Center for Food & Agriculture,* NY. Nov. 13, 2014. https://www.youtube.com/watch?v=JWKa9DWSlz4.
*Conference to Address Critical Issues in Sustaining the Global Food Economy.

inhospitable to mid-scale agricultural business. This is significant because at the same time that commodity agriculture has made it difficult to distinguish the quality of stewardship behind a product, opportunities for farmers to capture premiums or gain economic stability through branded programs that require vertical integration into processing, packaging, distribution and retail are also decreasing. At a time when care for our natural resources and wildlife has never been more important, farmers and ranchers not only have less time than ever to pay attention, but they continue to lose the ability to distinguish the products of their stewardship from the competition.

Other Effects on Western Working Lands

In the same way that the growth paradigm has caused agriculture to focus narrowly on productive efficiency and expansion, so that same paradigm has failed to slow the sprawl of urban areas in the West. Short term demand for housing pushes land values far beyond agricultural reach, and once-intact land becomes pavement. Unfortunately, the agricultural community tends to oppose land-use planning as a form of restriction on private property rights, which challenges one of the only tools capable of buying time for a rural area. It is not widely known, for example, that the Blackfoot Valley in western Montana, a place known for the excellent conservation work of the Blackfoot Challenge, is intact and undeveloped today as much for the 160-acre zoning at the north end of the county as for its other important efforts.

Even though residential development is often thought of in terms of increased local government revenues from property tax and overall economic success, unplanned rural sprawl often results in cost increases that outpace increased revenues. For example, it costs much more to provide emergency services, utility service and school bus routes to rural areas than it does within core urban service areas. As another example, sprawl that encroaches upon Wilderness-Urban Interface (WUI) drives up the cost of fire suppression and limits the ability to allow fire back into the system. One of the main effects of urban growth for working lands is that with each new subdivision, the burden to provide food, ecosystem services and habitat for the rest of society is increased on those lands that remain intact. This sets the stage for rural-urban conflict when, for example, Seattle newspapers criticize ranchers in rural Washington for struggling to share the landscape with wolves, even though it is the ranching way of life—and not that of urban Seattle—that holds the potential for being compatible with wolf habitat.

The growth of the outdoor recreation industry in the West, along with urban growth in general, continues to be celebrated as evidence that the public values open space and intact lands. Similarly, sportsmen make the argument that their interest in hunting and fishing opportunities helps to protect the resource. Certainly, it is good for people learn to appreciate the land by enjoying it, yet taking pleasure in the *use* of something, and taking *care* of it, remain separate things. As a form of human impact, recreation cuts both ways because its increase often means decreased refugia for wildlife and less of the solitude that people enjoy in the outdoors. As with the agricultural industry and urban planning, it is incumbent upon all user groups to consider ways to avoid "loving the land to death," and especially to invest in its restoration and ongoing stewardship. Just as the local food movement has helped to create dialogue and better understanding among farmers and their customers about improving the agricultural system, there is an opportunity to make recreational and amenity interest in western public lands and wildlife a driver for increasing public investment in stewardship on the landscape.

Improving Conservation Economics

Just as this paper does not focus on land protection and its associated tools and mechanisms (e.g. conservation easements), it also leaves aside the field of conservation finance. The focus, instead, is on annual revenue generation from operations—independent from the buying and selling of land—that can be consistent with conservation. It is also important to point out again that the conservation economics focus here is not on profit maximization. Profit is essential, but it tends to rank lower for western landowners than values such as "heritage" and "way of life." Moreover, landowners often make substantial investments in conservation, such as thinning overgrown forests or managing free public hunting access, in the face of economic incentives to the contrary.

It should also be said that there is much that individual landowners can—and are—doing now, within existing structures and with existing resources, to improve conservation economics. Excellent management can be its own economic reward and a paradigm change on the part of a manager is usually faster than reforming policy. One timeless principle is that it is often simpler to lower costs than to increase revenue. This change of focus often leads to adjustments, for example, in season of calving; timing, frequency, uniformity and overall degree of grazing utilization; mix of livestock or crop species and genetics; and fleet of equipment, among other management decisions.

It is also true that more and more farms and ranches in the West are working to diversify income streams through ecotourism, agritourism, hunting, fishing and a variety of other outdoor recreational offerings. In addition to money spent on the farm, tourists often patronize local businesses and sustain guiding and outfitting jobs, and the educational interaction can help to create mutual understanding across the urban-rural divide. However, recreation-based enterprises are not a panacea for struggling rural communities and fragile ecosystems. Depending on the particular circumstances, people enjoying leisure activities can be more disruptive to wildlife, consume more resources and leave a greater carbon footprint than well-managed livestock and farming operations. Leisure opportunities may better be considered as options to add value alongside existing operations, perhaps in cooperation with a network of neighboring properties than as stand-alone business models.

Ultimately, turning the big picture trends discussed in this paper requires a scale and urgency of response beyond what existing tools and approaches are achieving. Land management is of course a societal task as well as an individual one, and widespread policy improvements at the local, state and federal levels are necessary.

Principles and Leverage Points

Improving conservation economics is not synonymous with "getting more money." Rather, it includes all the various ways to increase support and decrease risks for stewardship, and vice versa for the competition. Policies must be designed not only to encourage more good but also to discourage harm. It almost goes without saying that it is much more fashionable to focus on the former than on the latter, yet in the long run one cannot be done without the other. Recognizing that no system is perfect and no set of policies can make it easier to take care of things than to abuse them, at a time when the playing field has been sloped steeply against stewardship, the goal should be to level that slope as much as possible.

For the purposes of this paper, the values that can be produced by intact lands and which depend on ongoing stewardship are simply categorized into two:[15]

1. Food and Agriculture (primary production of food and fiber as well as the value chain)
2. Ecosystem Services (ES) (climate stability, wildlife, water filtration, hunting, leisure)

The two categories are of course interdependent. In areas where nearly all undeveloped land is used for agriculture, ES might simply be subsumed into one category called "multi-functional agriculture." They are separated here to account for commercial activity on those intact lands that are not in agriculture. ES can be thought of as a collection of mechanisms to account for those positive externalities (e.g. leisure and aesthetic values) and negative externalities (e.g. excessive wildlife populations) that are unrelated to agriculture, or to account for positive externalities that have value beyond agricultural utility (e.g. carbon sequestration). Like the earlier examples of childcare and care for the elderly as positive externalities, ES values need not necessarily be monetized, but they must somehow be accounted for and supported.

As it relates to agriculture, ES should not be used in a "batteries not included" sort of way in which consumers are expected to buy their food and ecological health separately. In the 2002 Farm Bill, for example, EQIP cost-share dollars (public ES payments) were permitted to pay for manure management systems required by the EPA to comply with agricultural regulations. This is a patently wasteful use of public funds in which ecosystem services money is used to make up for negative agricultural externalities. There can also be important tradeoffs between agricultural and ES approaches that should be carefully considered. There is a tension, for example, between the capacity of a given piece of land to be productive for agriculture and habitat on one hand and to provide water as an ecosystem service for a city downstream on the other. As mentioned above, such tradeoffs also exist between agriculture and recreation: the capacity of land to provide wildlife refugia is in tension with the degree of recreational use.

The competitiveness of conservation economics depends on the particular calibration of a range of local, state or federal policies for food and agriculture, public lands, wildlife, water, energy, land-use planning and more. Whether market driven—as in the case of agriculture or mitigation banking—or not—as with the Conservation Stewardship Program in the Farm Bill—all require a government role in one form or another, including: legal sidebars and enforcement, taxes, subsidies, or standard setting. In re-calibrating policies to better support stewardship, the following principles should be considered:

1. Account for Ecology: Whether externalities are internalized into prices, or whether non-market mechanisms are used, a holistic accounting of impacts is essential.

2. Respect Carrying Capacity: The capacity of land to supply agricultural, ecosystem services, and recreational values is limited, and therefore demand must be limited.

[15] The various forms of energy production are not included as a separate category here because insofar as they are renewable, they might be counted as a form of agriculture or ecosystem service. Insofar as they are not, they are treated similarly to the development of transportation systems or cities. In the latter case, energy development should minimize its ecological impacts and mitigate those impacts that are inevitable (e.g. through mitigation banking). Ultimately, such forms of revenue generation stand in direct tension with ecological health and so cannot be drivers of conservation economics.

3. Encourage Biodiversity: Resilience to stressors is increased by genetic diversity within and across species.

4. Accommodate Adaptation: One watershed differs from another, and even one field varies foot-by-foot and day-to-day, therefore stewardship requires ongoing adjustment.

5. Target Moderate Scale in Agriculture: Mid-scale operations tend to optimize economies of scale with sufficient attention to ecologically integrated systems.

Of course, the economic stability of landowners also depends on factors that are not exclusive to working lands and that face many other Americans, such as rising health care and higher education costs. Such considerations, like the equitable distribution of wealth mentioned above, are beyond the scope of this paper and yet are essential to the topic of ecological health.

Directions for Policy Focus

This final section calls attention to important policy directions within the categories of agriculture and ES that might be prioritized in making stewardship more competitive with its alternatives. Individually, none of the suggested directions are original, and detailed treatment is not possible here. What is important is the way in which they are combined from a landowner perspective in a holistic approach to improving conservation economics in the West.

Food and Agriculture

Increase Public Investment in Agricultural Research and Technical Assistance

Landowners consistently cite technical assistance as one of their most important needs, yet on-the-ground capacity for USDA Natural Resources Conservation Service (NRCS) to provide technical assistance has decreased. Therefore, increased technical assistance for landowners should be a priority.

Public funding for agricultural research, unbiased by corporate interests, will be critical in providing the science and technology needed to improve the ecological footprint of agriculture while remaining productive in a climate that is becoming increasingly volatile and extreme. The accuracy, scalability and cost-effectiveness of monitoring (e.g. soil and vegetative health, carbon sequestration, water holding capacity, etc.) in distinguishing outcomes caused by management from those caused by other factors is very important. This is particularly true if ES market mechanisms (e.g., for carbon sequestration) are to be further developed.

Eighty percent of the 320 million acres of U.S. cropland is typically devoted to high yield annual crops, while only twenty percent is under some type of perennial cover. Humanity is quite dependent on these annual crops, and yet annual cropping systems (particularly monocultures) are far more likely to lose soil, nutrients and diversity over time. Ultimately, according to a 50 Year Farm Bill Proposed by Wes Jackson's Kansas-based Land Institute, overcoming this fundamental "problem of agriculture" requires development of high-yielding perennial grains that can be integrated into polyculture mixes where tillage is minimized.[16]

[16] Wes Jackson. "The Necessity and Possibility of an Agriculture Where Nature is the Measure," *Conservation in Context; Conservation Biology,* Volume 22, No. 6, 2008. *https://landinstitute.org/wp-content/uploads/2008/12/Jackson-ConsBio-cbi_1101.pdf*

Align Public Investments in Agriculture with Conservation Values

Reform of the Federal Crop Insurance Program (FCIP) should be a priority. FCIP premium subsidies apply to a narrow range of crops, limiting diversity and rotation on the land. Moreover, because payouts are tied to the expected yield and price of the crop in question, powerful disincentives are aligned against practices that might lower this year's yields (e.g. reduced tillage, cover crops, etc.). This places diverse cropping systems and livestock operations lacking a comparable risk management alternative at a disadvantage, and is a fundamental cause of plowing Northern Great Plains prairie. Conservation Title funding is too small relative to Commodity programs (about one third the size) to offset these disincentives, particularly in years of high commodity prices. One set of solutions might involve qualifying a wider diversity of crops under the program and instituting conservation compliance measures to qualify for subsidies.

A different solution may be to decouple government support altogether from the price and yield projections for a particular crop, as with USDA Pasture, Rangeland and Forest (PFR) Insurance, which cost-shares premiums with farmers and ranchers to mitigate the effects of drought but is unrelated to yield. It is common to hear that government payments should simply be done away with altogether. Yet, U.S. producers have often needed and requested public assistance in times of disaster, and some disasters are so severe that even the most robust and diversified operations may not survive. At the same time, many landowners understandably prefer not to deal with risk by means of increased regulations and prescriptions and would like to see mechanisms by which the public could help shoulder the costs and risks of managing a landscape from which it derives so much ES benefit. Even if imperfect, PFR is one mechanism for doing this.

Another approach with precedent outside the U.S., similar to PFR in some ways, is to provide direct payments to farmers, unrelated to agricultural yield, in exchange for compliance with certain conservation planning sidebars. This kind of system would require enrollment in a whole farm conservation plan that is tiered, with additional payments available for more advanced levels of stewardship practices on behalf of biodiversity, carbon, etc. It is true, as discussed earlier, that prescriptions for systems and practices are a somewhat blunt tool for ensuring stewardship, since the real value of stewardship lies in the art of adapting tools and systems to changing conditions. As advancements in monitoring technology proceed, it may become easier to distinguish and reward stewardship on the basis of outcomes rather than practices. In the meantime, however, planning and practices are steps in the right direction.

Make Room for a More Regionalized Food System

Concentrated monopsony or monopoly power in food processing, distribution and retail is detrimental to the goal of keeping lands intact and well cared for. Therefore, existing policy (e.g., Packers and Stockyards Act) should be enforced and new policy created where existing policy is inadequate. *Fair* (rather than *low*) prices to consumers should be an emphasis, with greater priority placed on ensuring competitive markets for farmers. USDA Food Safety and Inspection Service standards should be made more flexible to fit moderately scaled regional food processing applications, ensuring that farmers have the ability to add value to their products and to create new businesses where existing ones are failing to meet their needs.

Currently, agricultural products consistent with conservation rely on marketing their niche or specialty value by making claims to have some extra level of goodness over and above commodity alternatives. As a result, consumers are now presented with hundreds of labels making demands on their attention, and despite continued growth in these specialty sectors, taken together they still make up a small percentage of the overall market. If stewardship is going to be widespread across the landscape rather than a specialty attribute, it may be necessary to raise the baseline. Here again, whole farm conservation plans are worthy of consideration as a tool to qualify agricultural products as being produced under some basic level of stewardship.

Improve Public-Private Partnership in Managing Leased Public Lands

The economic viability of private working lands in the West is often dependent on access to grazing on public lands, and therefore, some refer to public lands grazing as an inexpensive easement on private lands. It is increasingly recognized that in western ecosystems that co-evolved with ungulates and fire, well-managed grazing provides important benefits to the landscape and should be seen as an ecologically compatible resource use and management tool rather than as a sort of reluctant accommodation to ranchers. As range science continues to show that the adaptability made possible by outcomes-based management—as opposed to management based on prescription—is better-suited to the continual variability of weather conditions and wildlife presence, it will be important for federal land management agencies to find ways to incorporate adaptive management into land-use planning.

It is possible that the precedent of the Forest Stewardship Contracting Authority could be applied more broadly and in collaboration with local communities and partners to achieve a wide range of resource management objectives. Shifting the dynamic between agencies and other stakeholders from one of regulatory enforcement to collaborative partnership could improve relations and help achieve mutually desired outcomes. For example, a partnership in the Southeast between the U.S. Fish and Wildlife Service (USFWS), the Department of Defense (DOD), state wildlife agencies, non-profit organizations and private landowners has significantly advanced conservation for imperiled species while enabling the DOD and landowners to continue productive use of their lands. The Sage Grouse Initiative is another example of successful collaboration based on partnership rather than a strictly regulatory approach. This requires a tempering of command-and-control culture, increased support for collaboration within the agencies and a reduction in agency staff turnover, particularly at the local level where success depends on trust developed over time.

Ecosystem Services

Continue to Fund, Support and Improve Proven Tools

Conservation easements, whether purchased or donated, continue to be an important way to resist the forces of residential and commercial development, buying time until the economy can be made to incorporate ecological considerations. Although the expectation exists that permanent easements will endure in perpetuity, this may be unrealistic if the economic paradigm continues to be incompatible with intact lands. While conservation easements often provide one-time payments and tax relief in exchange for ES, these incentives cannot be assumed to adequately cover the maintenance and stewardship of ES in perpetuity. For this reason, it may be important to consider additional funding to support stewardship efforts alongside easement protection.

Compensatory mitigation is a mechanism that requires industry to offset unavoidable impacts in one place with restoration and conservation in another according to certain criteria. Landowners with suitable lands who are willing to provide the required offset mitigation can generate income through the sale of mitigation credits. This tool has been effective for wetlands—which are relatively defined and discrete spatially—but has yet to come to scale for more complex habitat mitigation banks. The practical reality that there will always be economic activity disrupting intact lands makes mitigation an important source of conservation funding. Unfortunately for habitat mitigation, regulatory uncertainty at both the federal and state levels, as well as disputes amidst NGOs, agencies and private banks over whose mitigation model is better, has thus far crippled the development of these markets to the detriment of both landowners and the would-be buyers of credits. Ultimately, regulatory certainty is needed for habitat mitigation banking to grow beyond a handful of pilot projects.

In designating particular resource concerns, such as migratory corridors or at-risk species, it is important that adequate funding is made available not only to support easements, but also to cost-share conservation accommodations such as wildlife friendly fencing and off-stream water development. Funding for some of these practices is currently made available, for example, through the Environmental Quality Improvement Program (EQIP), which could be improved by making such agricultural practices as range riding and carcass disposal eligible for funding. Not only funding, but also indemnity from the risk of regulatory restrictions related to endangered species, such as Candidate Conservation Agreements with Assurances (CCAAs), is also important. However, given the dependence of so many western operations on public allotments, this tool could be made much more effective if it could also apply to ranchers' public lands leases rather than only to private land.

Identify New Mechanisms for Supporting Stewardship

Despite the availability of the aforementioned funding sources, accounting for the impacts and costs of managing land amidst wildlife pressures, along with concomitant hunting and recreational interests remains a major challenge. Ultimately of course, landowners must do more than simply cover the direct costs caused by the presence of wildlife and hunters, such as forage loss and impact, degraded fences and roads, etc.—they must also somehow generate sufficient revenue to cover the overheads associated with managing such activities on the landscape (e.g. time on the phone coordinating, time at meetings, equipment, taxes). Even landowners who do not rely on the land for their livelihoods will not tolerate an asset that indefinitely eats up money. In order to make the presence of wildlife, hunters and recreationists good news for the landowner, it may be necessary to make their presence a potential asset through commercial or non-commercial means.

Agritourism and ecotourism commercial opportunities represent one way to do this, although these enterprises are challenged in the West due to the ready alternative of so much public land that can be accessed for free. Big game hunting is one of those recreational attractions that can generate significant revenue, particularly in states like Colorado, Utah and New Mexico that allow landowners to allocate a certain number of licenses. However, this kind of commercial opportunity for landowners in hunting is much more limited in places like Wyoming and Montana, where the state strictly limits the ability for landowners to financially benefit from the presence of game species. While the North American Wildlife Conservation Model (NAM) has been successful at recovering game species, it is less well-suited for limiting the populations of these species when they begin to exceed carrying capacity, and less successful in conserving the many non-game species.

Increasingly, the widespread dependence of publicly owned wildlife, and particularly endangered species, on private lands will require that landowners are able to benefit in some way from their presence. Programs such as Colorado's Ranching for Wildlife or Florida's Private Lands Deer Management Program have met with some success by providing new public and youth hunting opportunities and other wildlife conservation measures in exchange for hunting season flexibility and landowner tags. Where commercial opportunities for landowners to benefit from wildlife are either not appropriate or not politically feasible, pay-for-presence or habitat lease programs are worth consideration. Funds for piloting such lease programs, say for elk in Wyoming or Montana, could be raised primarily from private sources, but ultimately public funding would probably be necessary for such a program to achieve sufficient scale.

In March 2018, Wyoming's governor signed a state joint resolution to the U.S. Secretary of the Interior suggesting that a Yellowstone conservation fee be instituted on the more than 4 million tourists who visit the park annually to help pay for such things as reducing wildlife-livestock conflict along migration routes, reducing highway collisions, etc. While that particular piece of legislation was largely symbolic, such mechanisms will be increasingly important given that neither Yellowstone nor the other national parks are large enough to support their wildlife populations without relying on surrounding state and private lands. Investing in the ability of this larger landscape to accommodate wildlife impacts is essential, and the issue is much bigger than one national park. As a few high-growth metro areas in the West continue to attract businesses, employees and retirees based on the allure of the landscape's natural amenities, states must ensure that fiscal policy provide mechanisms for those businesses and those people to support the preservation and ongoing stewardship of that landscape.

Closing: Evolving Forms of Governance

Historically, conservation has focused primarily on conserving wild places by setting them aside or protecting them from human impacts. Without intending to diminish in any way the importance or challenge of wilderness protection, it is nevertheless the case that preserving largely uninhabited places is more straightforward than the task that now lies before us in integrating conservation into working lands. The need to conserve ecological values within working lands has become increasingly apparent and deeply urgent.

Despite their rugged beauty, many wilderness areas were available for wilderness protection because they were the least habitable, most environmentally extreme portions of the landscape. Human settlement, by contrast, has tended to follow the waterways and fertile, accessible valleys. These productive, biologically diverse and water-rich lands went early on into private ownership, which accounts in large part for the fact that so many wildlife species depend on private lands for survival. Conservation in this landscape depends heavily on the actions of private landowners and the influences shaping their actions. As Aldo Leopold famously said, "Conservation will ultimately boil down to rewarding the private landowner who conserves the public interest."

While wilderness, by definition, represents the absence of human intervention and management, working lands are precisely the opposite. It should not come as a surprise that the tools and strategies needed to enact conservation in wilderness must differ from those needed in working landscapes, and yet environmental advocacy and policymaking have failed, in large part, to account for this difference. In working landscapes, the complex, dynamic and interwoven physical, biological, social and economic forces at play, coupled with the need to sustain multiple and

sometimes conflicting values, make land and natural resource management uniquely challenging. Science is still in its infancy with regard to many aspects of natural systems and often yields more questions than answers to the land manager. It is widely acknowledged that adaptive management is an essential part of competent stewardship, and this requires flexibility, open-mindedness and constructive relationships among the many relevant stakeholders.

In this context, centralized bureaucracies, purist ideologies and blanket management prescriptions fall apart. While regulation can to a degree avert harm to targeted values such as wildlife, it cannot compel artful, beneficial stewardship. In certain cases, it inspires the opposite—as in the "shoot, shovel and shut up" response by some to endangered species. It also is not possible to direct from afar the practices and outcomes of a given landscape as one might for wilderness protection. Yet this is precisely what we continue to try to do and why many rural people decry environmentalism as the newest form of colonialism.

The challenge of conserving our working lands and the multiple values they sustain requires that our collective thinking and institutional frameworks evolve beyond wilderness and environmental protection. This need has been felt within rural, working lands communities for the past several decades and has given rise to the growing grassroots movement often called community-based or place-based collaboration. Pioneered by groups mentioned earlier such as the Malpai Borderlands Group and the Blackfoot Challenge, place-based collaboration represents an organic flowering of what may eventually prove to be a new model of governance—one which provides for significantly greater local discretion in the management of large, multi-jurisdictional landscapes within state or federally established sidebars.

This is already cropping up even into federal land management agency policies and directives, despite the fact that agencies are often poorly equipped to support such collaboration in practice. Some environmental proponents view "local control" as code for circumventing environmental protections, the assumption being that locals would likely be predisposed to support extractive and environmentally destructive land uses. Increasingly, however, as political polarization and dysfunction mount at the national level, the conservation successes of the numerous watershed-scale groups are demonstrating both the necessity and the promise of place-based collaborative leadership.

Ultimately, core aspects of our economic paradigm are not compatible with conservation. Not only agriculture, but also the entire economic system has yet to make sustained ecological health a fundamental goal. The western U.S. has been called one of the last ecologically intact large landscapes on Earth, thanks not only to the achievements of the conservation movement but also to rural people who have quietly been learning and demonstrating how to live with grace and elegance on western lands. As we move forward, reluctant tolerance and occasional compromise on the parts of agricultural and environmental constituencies will be inadequate to meet the magnitude of the challenges we face. Taken together, wholesome food, abundant and diverse wildlife and a hospitable climate provide a broad common ground from which to work together, yet perhaps the most powerful motivation lies in our shared love for the captivating western landscape. It is past time for environmental, conservation and agricultural interests to link arms in aligning the fundamental economic paradigm with conservation economics.