Chapter 1
Restoring and Sustaining Lands—Coordinating Science, Politics, and Community for Action

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Abstract We propose that a new conceptual framework is needed for conservation and land restoration to achieve sustainability. We present two conceptual models—Static Productive Harmony and Dynamic Productive Harmony—for formulating environmental policy and making natural resource management decisions. The static model seeks a balance among ecological, social, and economic systems through compromises that require trade-offs that often end up satisfying no one. The dynamic model represents a fundamentally different approach to restoring and sustaining lands. In this model, healthy ecosystems are the foundation for thriving communities and dynamic economies. The dynamic model aims to generate resource management approaches that add value to each of the systems for a mutual gains outcome. Restoring and sustaining lands is a wicked problem. New institutions need to be shaped that support ongoing collaborative and participatory processes to achieve durable and equitable environmental policy.

Keywords Ecosystem health • Land restoration • Collaboration • Land ethic • Wicked problems • Trust • Relationships • Productive harmony

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"For the first time, I understand the benefits to my family's welfare to manage my ranch for a healthy ecosystem. More importantly, I recognize the responsibility I have to all of society to restore my land and maintain it as a healthy ecosystem."[1] The rancher that made this statement experienced an epiphany. He gleaned an insight that is the underlying premise of this book—healthy ecosystems are the foundation for thriving communities and dynamic economies. He came to understand that his economic wellbeing and his family's quality of life depend upon restoring the natural environment of his ranch. That same link between economies and the environment applies broadly across communities. Sustainability is an illusion unless communities understand the importance of restoring lands to health and protecting the environment and *manifest their understanding through action*.[2]

This book gives voice to others like the Nevada rancher. It is not an academic tome, although some contributors are with academic institutions. And it is not a guide book or handbook by practitioners setting out procedures and methods for collaborative conservation. It is a narrative of diverse voices that collectively talk about coordinating science, politics, and communities to manage ecosystems in harmony[3] with social and economic systems. The common thread through each of the chapters is the belief in the effectiveness of *people acting together* to achieve durable solutions for restoring lands. Each of the authors, who generically might be classed as "scholar practitioners," has a very different background, set of experiences, and career path—engineer, social scientist, political scientist, physical scientist, biologist, ecologist, natural resource manager, policy maker, activist citizen, federal government scientist, urban planner, landscape architect, computer modeler—yet their paths led each of them to embrace the promise and power of collaboration and the ability of people to express their diverse values in grappling with complex and contentious environmental and land use issues.

These chapters provide some insights as to why and how the individual paths of participating authors converged. Although each chapter stands alone and can be read independently of the others, a greater understanding will come through reading the book in its entirety. We will help the reader in that understanding by linking each chapter in each section, linking each section, and concluding with a synthesis and recommendation for a more effective process that coordinates science, politics and communities to restore and sustain lands. In this regard, the appendix will help you understand how these concepts translate into action on the ground.

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[1] A rancher in eastern Nevada said this to Herman Karl about in 2004 when Karl was visiting two privately held ranches that practiced holistic ranch management.

[2] The challenge is not only that of action; it is how to develop institutions that provide the incentives, feedback, and accountability that help people understand the results of their decisions, be accountable for them, and adjust to changing circumstances.

[3] Thoreau provided a view of harmony in Walden published in 1854 that is as true today as it was then: "Our notions of law and harmony are commonly confined to those instances which we detect; but the harmony which results from a far greater number of seemingly conflicting, but really concurring, laws which we have never detected is still more wonderful" (Sayre 1985). Has he anticipated the field of ecology and Leopold's land ethic?

Since the environmental crises of the 1960s, societies have endeavored to find ways to manage natural systems and the services they provide in harmony with social and economic systems. Enacted in 1969, the foundational modern U.S. environmental law, the National Environmental Policy Act (NEPA), sets forth this aspiration and outlines the decision processes that are intended to help federal agencies better achieve "productive" harmony among ecological systems, economic systems, and social systems. At least two decades of sustainability initiatives, likewise, have aimed for this harmony. Yet these efforts continue to fall short of their aspirational promise. One increasingly apparent barrier pertains to governance processes and institutions, which this book addresses in several chapters. Another fundamental barrier is the tension between the environment and the economy[4] (Layzer 2006).

Productive harmony is most often interpreted to imply an equal status among the three systems. However, one worldview puts economic systems and societies they support on a higher plane than ecological systems, whereas another worldview elevates ecological systems. These opposing worldviews generate conflict, which often results in dysfunction, because the antagonists on one side presume robust economies are attained at the expense of ecosystem health (despoiling the environment) and those on the other side believe aggressive environmental protection and ecosystem restoration are not compatible with strong (profitable) economies. Some actions to reduce environmental impacts do carry costs, and most production and consumption activities have some environmental impacts. However, pursuit of economic and environmental benefits need not be a zero-sum contest. Such a framework presents an unnecessary dichotomy. Adherence to it causes polarization and stalemate. The potential tensions between economic actions and environmental protection, when managed well, can transform into a creative tension that can lead to breakthrough solutions—the harmony among ecological, economic, and social systems envisioned in the National Environmental Policy Act. The chapters in this book illustrate various ways for turning potentially bitter and deadlocked disputes into *actionable, productive, and durable outcomes that address environmental, economic, and social goals*.

Implicit in this book is the belief that healthy lands are the foundation for thriving communities and dynamic economies,[5] as stated in the opening paragraph. The conventional conception of productive harmony among the three systems is that each system occupies the corner of a triangle or some other trilogy analogy (Fig. 1.1, Static Productive Harmony model). Productive harmony, or sustainability, is achieved at the center of the triangle, which seldom occurs in practice. There are various paths and combinations to reach the harmonious center, yet these paths often require trade-offs that can possibly (and often do) result in deadlock. Theoretically, productive harmony could be achieved at numerous

[4] "Civilization has so cluttered this elemental man-earth relationship with gadgets and middlemen that awareness of it is growing dim. We fancy that industry supports us, forgetting what supports industry."— Aldo Leopold

[5] "We abuse land because we see it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."—Aldo Leopold

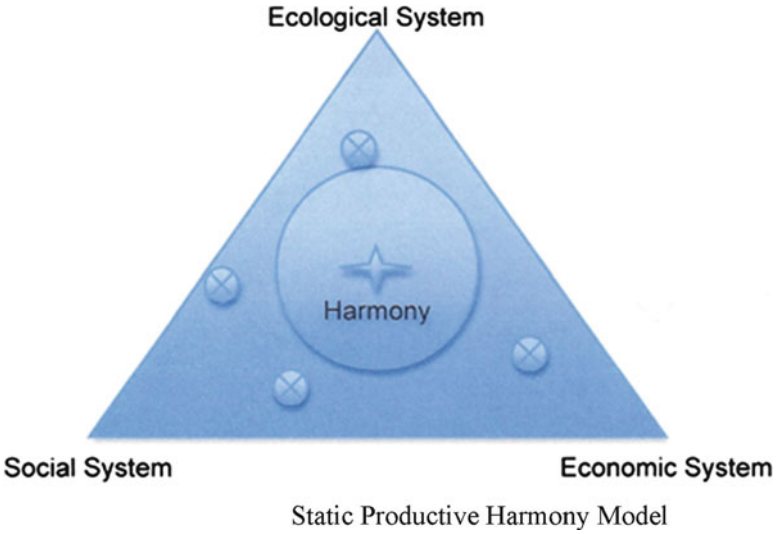

Fig. 1.1 This is a representation of the traditional way of thinking of harmony among ecological systems, social systems, and economic systems. The *dots* with crosses represent a few of the infinite combinations within the circle among the three systems. This is a static model, with movement only possible within the bounds of the triangle, with sustainability essentially conceived as a series of different tradeoffs

points along these paths through compromise. But compromise is difficult to achieve, particularly where mistrust flourishes and, where decision making remains framed within the triangle of competing systems, there is no way to think outside the "box."

Another way to visualize productive harmony is to look at sustainability as a house (Fig. 1.2). In this conceptual model, Dynamic Productive Harmony, ecological systems are the foundation of the house and the heating, plumbing, electrical, and water systems (infrastructure) of the house; social systems are the living spaces (superstructure); and economic systems are the flows of goods and services such as food and fuel into the house to service the living spaces.[6] The engines (ecosystem services) for the infrastructure are housed in the basement, the structural foundation of the house. The environment is the overall framework of the house that shelters all. A deteriorating framework exposes everything within the house to the weather, with degradation or even, ruination resulting. Similarly, if the foundation is faulty or allowed to deteriorate, the superstructure and flow of goods and services will eventually deteriorate. Indeed, if the foundation has been neglected, a nicely painted house may provide a

[6]Ecological systems are both foundations and infrastructure. Using ecosystems in an ecosystem services framework is often about replacing "gray" infrastructure—levees, wastewater treatment plants, etc.—with "green" infrastructure—coastal sea marshes, wetlands, etc. Economic systems are not really just matters of "static" infrastructure—bridges, roads, airports, etc. As systems, economies are highly dynamic contexts through which people exchange goods and services, allocate scarce resources, etc.

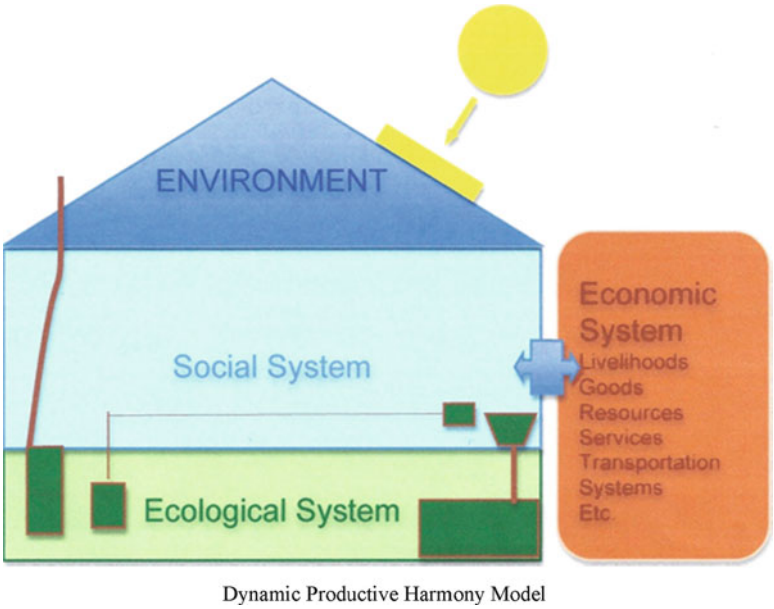

Fig. 1.2 In this conceptual model the ecological system is the foundation and infrastructure for robust social systems and strong economic systems. Sustainability is not possible without a healthy ecosystem. This is a dynamic model reflecting the complex and complicated dynamics of coupled natural and human systems. The "*house*" needs constant upkeep and if the needs of the family (society) change it can be expanded and remodeled. It is a dynamic, process-oriented model. Sustainability is attainable as an outcome of continual decision-making processes

false sense of security. The house must be constantly maintained (a continuing process) to stay in good repair. Given a strong foundation, the house can be remodeled and enlarged—breaking out of the original "box." The architect (scientist/engineer), general contractor (policy maker/economic actors), subcontractors (natural resource managers/land use planners), and owner (citizen/community) together can create something new to fit the growing needs of the family (society/nation).[7]

The distinction between these conceptual models is critical as they represent two fundamentally different approaches to restoring and sustaining lands and setting environmental policy. Following the first conceptual model, policy tends to move toward compromise among the three systems by seeking the center of the triangle, equating harmony as balance, but generally requiring tradeoffs among systems. Trade-offs are presumed at the expense of one system over another. In the second, policy focuses on sound construction and preservation of the foundation and the overall decision framework to sustain and preserve the superstructure, infrastructure, and resource flows. Trade-offs may still be necessary in this model. However, value can be added by "remodeling" mitigating trade-offs. Others have described this

[7] Anyone who has built a house knows that there is constant negotiation and tension among the architect, contractor, subcontractors, and owner. When tension is managed well, a superior house is built.

intersection of environmental, economic, and social values as achieving "triple bottom line" or win-win-win outcomes.

The recognition that natural resources—the environment—must be conserved for the wellbeing of future generations emerged at the turn of the nineteenth century. President Theodore Roosevelt designated thousands of acres as national parks and national forests. The Progressive Movement reflected in these designations was, in part, a reaction to what was perceived as an over-exploitation of natural resources during the middle of the nineteenth century. He and America's first professional forester, Gifford Pinchot, introduced the concept of scientific management into the federal agencies and policy apparatus. The objective nature of science was thought to counter subjective and partisan politics as factors in making decisions about the management of natural resources. Yet this perspective has at least two limitations. First, the conduct of science itself is situated within value frameworks that shape (and may limit) the questions addressed through scientific inquiry. Second, resource management decisions involve matters linked to personal and social values, preferences, and priorities—such issues are not purely technical. To overlook these constraints can result in unintended consequences.[8] "Just because an idea is true doesn't mean it can be proved. And just because an idea can be proved doesn't mean it is true. When the experiments are done, we still have to choose what to believe" (Lehrer 2010, 57).[9]

Choosing what to believe is a function of values, worldviews, and cultural norms; people with different worldviews may hold the same values, but they may weigh each value differently. One's choices can change as one's life experiences accumulate and thinking evolves. The career of Aldo Leopold is exemplar in this regard (Meine 1988). Leopold was trained at the Yale School of Forestry in the scientific method of land management. Early in his career, he practiced the utilitarian principles of multiple uses of forests; forests were surveyed and trees counted to assess

[8]Karl was an instructor in the Bureau of Land Management Community-based Ecosystem Stewardship course; he taught the role of science in collaborative processes. These courses were taught at sites of some of the most contentious environmental issues in the country. He would start by asking the participants what they thought of and what their experience had been with science and scientists. A few people would say: "Smart people." "People in white lab coats." Many, though would say: "Lying SOBs." "You can't trust them as far as you can throw them." "You can pay any one of them to say anything you want." Clearly, their experiences with scientists and the information they produce were not that of objectivity. This experience was an epiphany for Karl. Every scientist that he has related the story too, has expressed shock. Too many scientists stay in their offices, laboratories, and discount local knowledge when in the field. More scientists should work with people to experience problems from their perspectives. Scientists might then take a more humble attitude toward their science and knowledge (see for example, Andrews 2002).

[9]The issue is not whether to "believe" experimental results per se. Indeed, science is all about a method of replication to try to validate results, rendering them (potentially) more robust. Rather, the issue goes back to the matter of different cognitive and decision purposes. Science is about asking, "how does the world work." But social and political choices are about "what values do we hold, what priorities do we hold, what are our individual preferences." Science cannot answer these questions. For example, scientists can examine what happens if some contaminant enters the soil. They can't answer the question: how clean is clean enough, which is a values question.

number of board feet that could be harvested in a sustainable way. Game (wildlife was a term not then used) management consisted of protecting prey species and killing predators. The field of ecology was not yet invented. Gradually and progressively Leopold began to understand that species were not isolated but connected as part of a complex biotic system and that it is the system (the environment) that must be preserved; disturbing any one part causes unbalance and dysfunction throughout the ecological system. But he understood more—he understood that science was not enough. In *Thinking Like A Mountain*, he describes the killing of a pack of wolves (Leopold 1949, 130). "We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes—something known only to her and to the mountain." His personal evolution was cut short by an untimely death fighting a fire in 1948. His prescient work culminated in the *Land Ethic* (Leopold 1949). With regard to restoring and preserving lands, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise (224–225)." Notably Leopold states, "I have purposefully presented the land ethic as a product of social evolution, because nothing so important as an ethic is ever 'written'. … I think it is a truism that as the ethical frontier advances from the individual to the community, its intellectual content increases" (225).

With this simple yet profound statement, Leopold had captured the essence of advances in social-ecological system thinking to the present day. Today we talk in terms of resilience, emergent properties, and dynamics of coupled natural and human systems (Gunderson et al. 1995; Folke et al. 1998; Gunderson and Holling 2002; Gunderson and Pritchard 2002; Berkes et al. 2003; Liu et al. 2007). The enhanced scientific and conceptual understandings of social-ecological systems are effectively refinements of Leopold's land ethic; and even with all the scientific advances, application of these concepts to environmental policy remains elusive. We need to make routine the processes that have been developed that teach us how to learn (double-loop learning; Argyris and Schon 1978), to learn from doing, and to make mid-course adjustments in our decisions based on what we learn. Research and analysis remains important so that we continue better to understand complex, dynamic ecosystems. Above all, however, we need better ways to strengthen linkages of science with experiential knowledge and to enhance processes and institutions that facilitate dynamic decision-making. We need to nurture the *political and social will to undertake the hard work of collaboration, and, particularly, to shape the institutions, policy tools, and science support that sustain collaborative action over time.*

We hope to advance the social evolution of the land ethic by inspiring our readers to reflect upon their relationship with the environment and to *take action to reflect that land ethic in decision making processes and resource management choices*.[10]

[10]Climate change has accelerated the need for society to evolve socially and to continue to develop a land ethic that instead of economics is the basis for political and social action. We must find ways to adapt to changing climate. We must evolve a new mindset that jumps beyond the bounds of the current environmental movements, which seem to have ground to a halt only staying the line and not moving further toward the goal.

To do this, we need to nurture a *new ethos* with respect to people's relationships to nature and the governance and management of natural resources and ecosystems; Nurturing the sort of land ethic Leopold and others have described will take generations of institutional evolution and experience.[11]

Beyond the challenges of reorienting how we think about the interrelationship of social, economic and environmental systems, land and resource managers face another conceptual challenge. Restoring and sustaining lands are wicked problems (Rittel and Webber 1973; Miller 1999; Ison and Collins 2008; Brown et al. 2010) because they require decisions at the interface of science, engineering and technology, governance and policy, ecology, culture, values, and livelihoods. We have described the possibilities of blending environmental, economic, and social values in land and resource management decisions. However, even where this blending may be possible, many land and resource management issues are "wicked problems" that have no solution only better or worse outcomes. In part, they are wicked problems because these problems unfold within highly dynamic physical, social, and political contexts. Change is often nonlinear and, hence, not readily predicted. Moreover, many of these problems involve multiple physical variables and many potentially desirable outcomes all of which cannot be jointly achieved in a context of scarce human, financial, and other resources. These problems require a continual process to address them, just as our dynamic productive harmony model requires an ongoing process of decisions regarding routine "maintenance" and adaptation to surprises (a tree falling on the roof) for sustainability. In recognition of these properties and to simplify discussion, we grouped chapters into three sections:

- Science, Technology, and Engineering (Tools and Methods)[12]
- Politics and Policy (Governance and Frameworks)
- People and Action (Stewardship, Community, and Implementation)

The order of these sections mirrors in a way the chronology of approaches to land restoration.

Scientific management was introduced at the turn of the nineteenth to twentieth century and "decisions based on sound science" has been the mantra for natural resource management agencies ever since (McKinney and Harmon 2004; Karl et al. 2007). Engineering solutions started modestly with control of flooding, for example, by constructing dams and levees and draining wetlands and marshlands to turn them into "productive" lands. As technology advanced, engineering solutions became more ambitious; the construction of the enormous dams in the western

[11] Although it appears late in this book, Chap. 20, *The Tomales Bay Watershed Council: A Model for Collective Action*, is especially important as an exemplar of this new ethos in action.

[12] "Our job is to harmonize the increasing kit of scientific tools and the increasing recklessness in using them with the shrinking biotas to which they are applied. In the nature of things we are mediators and moderators, and unless we can help rewrite the objectives of science we are predestined to failure."— Aldo Leopold (1949)

Sections III and IV address our role as mediators and moderators and stewards of the land.

states and the attempt to manage water in the Greater Everglades Ecosystem for agricultural purposes are examples. Whereas some of these projects have provided great benefits, they have also often transformed ecosystems in ways that have resulted in unintended negative outcomes. The devastation of New Orleans by Hurricane Katrina is one example, which many attribute to man and not nature (Groat 2005; Thornburgh 2005). Nature repeatedly has taught us many lessons, but we do not learn those lessons well. Without doubt, science, engineering, and technology have produced innumerable benefits to humankind. However, with respect to engineering large ecological systems we have come up short. Leopold (Meine 1988, 383) hit the nail on the head:

> 'What I decry is not so much the prevalence of public error in the use of engineering tools as the scarcity of engineering criticism of such misuse.' The engineer respects mechanical wisdom, … because he creates it; *he lacks respect for ecological wisdom not because he is contemptuous of it, but because he is unaware of it* [emphasis added]. 'We end,' Leopold concluded, 'at what might be called the paradox of the twentieth century: our tools are better than we are, and grow better and faster than we do. They suffice to crack the atom, to command the tides. But they do not suffice for the oldest task in human history: to live on a piece of land without spoiling it.'

Our use of the word science includes the social and political sciences as well as the natural and physical sciences. The dynamics and complexity of coupled natural and human systems require an *integrated,* interdisciplinary approach. And local, experiential, and indigenous knowledge need to be part of the equation for describing and understanding these systems. Scientists often dismiss this form of knowledge. But as Thoreau states in *Walden* (Sayre 1985, 490):

> Fisherman, hunters, woodchoppers, and others, spending their lives in the fields and woods, in a peculiar sense a part of Nature themselves, are often a more favorable mood for observing her, in the intervals of their pursuits than philosophers or poets even, who approach her with expectation. She is not afraid to exhibit herself to them. … We are most interested when science reports what those men already know practically or instinctively, for that alone is a true *humanity* [emphasis original], or account of human experience.

Thoreau, in 1854, appears to have answered the question that E.O. Wilson posed in 1998 (13) and believes every college student should be able to answer: *"What is the relation between science and the humanities, and how is it important for human welfare?"*[13]

We need to heed voices of the past such as Thoreau and Leopold, while continuing to make new discoveries. *Ultimately, however, it is through social and deliberative processes that individuals singly and in communities articulate their values and priorities, identify challenges to fulfilling those values and priorities, and determine*

[13]Theodore Roosevelt also pondered this question. "His subject, 'Biological Analogies in History,' was one that he had pondered since discovering, as a teen ager, that he was equally drawn to science and the humanities. It seemed to him that these disciplines, rigorously separated in the nineteenth century might drawer closer again in the twentieth, as scientists looked for narrative explanations of the mysteries of nature, and scholars became more abstract and empirical in their weighing of evidence (Morris 2010, 74).

how to address those challenges. Scientific and technical tools should be aids to a deliberative process and not an intrinsic end.

Political systems refer to institutions and rules by which communities, regions, and nations conduct their collective decisions and allocate shared resources. Politics arise as participants jockey for voices in shaping these institutions and rules. Because many natural resources are public and land and natural resource decisions—public and private—affect communities, these decisions are buffeted by political jockeying. There is constant conflict between the western and eastern states at the federal level over resource issues. Communities compete for water. Resource users compete over who has access to what resources, when, where, and how. Different federal agencies have mandates to manage the same resources. The Bureau of Reclamation has jurisdiction over many hydropower and irrigation projects; the Army Corps of Engineers constructs and manages navigation and flood control projects. The Bureau of Land Management (Department of the Interior) and U.S. Forest Service (Department of Agriculture) both manage public lands, often with conflicting regulations pertaining to logging, grazing, recreation, and other land uses. There is little coordination among agencies, and often competition for limited financial resources. Here again, Leopold (1949, 213) was prescient: "At what point will governmental conservation, like the mastodon, become handicapped by its own dimensions?" In response to the unimaginable environmental crises of the 1960s—polluted waters, contaminated soils, dirty air—a series of laws were enacted (NEPA, Clean Water Act, and Endangered Species Act are examples). Many of these acts are administered by different agencies with sporadic or no coordination and often rivalry.

Within this medley of agencies, sometimes overlapping laws, competing priorities, and political conflict, environmental and natural resource managers often looked to science, in rhetoric if not always in practice. Again, analogous to the initiation of scientific management to mitigate or obviate partisan politics, outcomes mandated by some of these acts were based on concepts of risk assessment (National Research Council 1996), though regulatory decisions and environmental management practices reflected a continual mix of politics and science.

The concept of adaptive management, first clearly articulated in the early 1970s (e.g. Holling 1973, 1978; Walters 1986), produced insights about resource management in a context of scientific uncertainties and dynamic conditions. Subsequently, recognizing the interconnectedness of many resource management issues, the concept of ecosystem-based management surfaced in attempts to manage natural resources and public lands more holistically. However, in more than three decades of practice only a handful of adaptive management cases worldwide have been successful, and many large-scale efforts at ecosystem-based management have met with significant implementation challenges. The reasons for this vary and involve ecological, political, and social issues. Changes in ecosystems in response to management decisions may take decades to detect; the short-term nature of the political and funding cycles is not compatible with the long-term nature of adaptive and ecosystem-based management. Consequently, funds are not appropriated to monitor and evaluate the effects of management decisions,

which is a basic principle of adaptive management. Sometimes adaptive management plans have been developed without close collaboration of scientists and managers. Perhaps most fundamental is that current governance rules and structures are not well suited to use these management practices that require flexible and cross-agency decision making.

Increasingly, conventional top down governance models and policy tools for managing lands are not sufficient for dynamic, integrated solutions to our vexing and complex environmental problems (Koontz et al. 2004; Brunner et al. 2005; Ison and Collins 2008). Consequently, new governance models such as adaptive governance and networked governance are emerging. These new models emphasize cross-agency coordination, public-private collaboration, and flexible responses to ever-changing conditions. In part as a consequence of the environmental crises of the 1960s and out of frustration over what was perceived as insufficient action by the federal and state governments, citizens became more active in environmental and natural resource management issues. Many watershed associations sprang up around the country. Now there are hundreds of collaborative groups where citizens participate in managing lands with uneven success.[14]

No process or approach is a panacea. Still, well-designed collaborative processes that involve diverse participants hold great promise (Wondolleck and Yaffee 2000; Bryant 2004; National Research Council 2008). The Department of the Interior, the Nation's largest land management agency, in its fiscal year 2003–2008 strategic plan, set as a goal the creation of a nation of citizen stewards with department personnel gradually working as facilitators with citizens to manage and restore lands. In essence, it is an attempt to develop a community of practice. Once again, we go to Leopold's well (1949, 203, 204). "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. … The land ethic simply enlarges the boundaries of that community to include soils, waters, plants, and animals, or collectively: the land."

This book mirrors that enlarged community through the mix of chapters that are interdependent. Each section is introduced with a chapter that sets the context and links the section chapters into a coherent whole. The authors are colleagues and friends of the editors. Collectively, they represent scores of years of practice and active research. The narratives, for the most part, are not analyses of the work of others and cases. They manifest "action" research, policy-making, experiences, and practice of

[14] "It is not the critic who counts, not the man who point outs out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood, who strives valiantly, who errs, and comes up short again and again, because there is no effort without error or shortcoming; but who does actually strive to do the deeds; who knows the great enthusiasms; the great devotions; who spends himself in a worthy cause; who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who know neither victory or defeat." Theodore Roosevelt, Citizenship in a Republic, speech given at the Sorbonne, Paris, France, April 23, 1910.

doers on the ground. Their experiences are not filtered through the lens of analysts and interpreters. There are many academic books and articles that offer analyses of cases and critiques of the methods and processes set forth in this book. Whereas we may not necessarily agree with some of the premises, analyses, and interpretations of these authors, they are valuable as different points of view and should be read and reflected upon by anyone reading this book. Although there is a plethora of second-person interpretations and analyses of collaborative conservation, there is a dearth of first-person accounts. This book provides the unfiltered perspectives and stories of those whose work is often interpreted by others. We conclude the book with a synthesis of the barriers and challenges for restoring lands and sustainability, a road map for overcoming these barriers and a prescription for designing and implementing the new processes and institutions to tackle wicked problems to achieve sustainability, and an outlook for the future.

It may come as a surprise that we have so prominently cited a few voices from the past. However, in these and other classic and timeless works, there are insights that are the keys to living in harmony with nature. In our view, it is those who have lived with nature and whose livelihoods and wellbeing are bound to nature that are best able to discern and unravel how humans can live in harmony with nature. Yet, we do not marginalize the discoveries of science that provide us with information. Neither science nor local, experiential, and indigenous knowledge alone is sufficient for understanding complex and interdependent natural and human systems (Adler and Birkhoff 2002). It is through the social and political processes that these two forms of knowledge are integrated with community values. Through collaborative learning we might attain the wisdom to make better choices.

Before continuing, it is essential to define collaboration—what people acting together means to us—so that you, the reader, and we are talking the same language. There is a continuum of public participatory practices.[15] In this book we focus on the use of consensus-based decision-making processes by local groups comprised of diverse stakeholders, what is usually called multi-party negotiation (Susskind et al. 1999). Chapter 20 describes this in practice. These groups could be pieces of a larger networked collaboration. A consensus-based process sets out not to achieve compromise among the parties, but to *create value for mutual gains* (Susskind and Field 1996). This is an important distinction. There are times it is not possible to add value and the group settles for compromise. Collaborative groups arise for a number of reasons—sometimes because of the threat of litigation and sometimes organically because participants hold shared values or shared concerns. It is the grass roots, organically emergent collaborative efforts that especially interest us here.

Partnerships and coordination among parties are forms of collaboration but they ought not to be confused with a well-designed, consensus-seeking participatory collaborative process, which is guided by specific protocols and best practices. The

[15]To learn more visit the International Association for Public Participation website http://www.iap2.org/

elements of a consensus-seeking process include: inclusiveness, self-selection of diverse participants that represent a range of interests addressing a problem in common, openness, and transparency. A neutral professional facilitator usually, though not always, manages the process. The facilitator establishes ground rules with the participants. It is an ongoing and evolving process that requires numerous regular meetings. And it is not a process appropriate for all situations. A well-designed consensus seeking process will begin with an issue or stakeholder assessment (Susskind et al. 1999). This assessment will determine if a consensus process is possible, if another form of collaboration is appropriate, or if no collaborative process is appropriate. It is worth noting that critics of collaborative processes often cite power disparities as a major factor that prevents a "fair" outcome. A stakeholder assessment will determine if power differences are so disproportionate that it will not be possible to engage in a consensus-seeking process. There will always be differences in power among parties and methods have been developed to deal with these differences as part of a multi-party negotiation.[16] Like any human endeavor, collaborative process approaches do fail. There are a number of possible reasons for failure. Foremost among them, in our view, is that the process was not designed well from the beginning. When evaluating collaborative process approaches care must be taken to determine if the process is in accord with the best practices developed over the last 35 years.

In the concluding chapter we describe a form of collaboration called "collective impact initiatives"(Kania and Kramer 2011), which holds great promise for the social and decision making transformations necessary to live in harmony with nature. These "are long-term commitments by a group of important actors from different sectors to a common agenda for solving a specific social problem. Their actions are supported by a shared measurement system, mutually reinforcing activities, and ongoing communication, and are staffed by an independent backbone organization" (39).

Achieving sustainability is simple, if we have the *will* to put in place and live according to a few fundamental principles, the *willingness* to take part in a dialogue and not a diatribe,[17] to do the hard work, and the supporting institutional and decision making frameworks that provide incentives, feedback, and accountability. Most

[16]The U.S. Geological Survey developed a role-play simulation game, called the Airport Game, in 2000 as part of a class at Stanford University on integrated approaches to environmental assessments. The roles purposefully were given disproportionate amounts of money to set up a large power disparity. The role players were allowed to negotiate outside of the classroom. We found that many of the players came up with solutions that created value. For example, two or more of the environmental groups that were not well funded, formed a partnership to pool their funds. Because of the nature of the environmental controversy (the proposed expansion of San Francisco airport into the bay), these environmental groups were in disagreement with one another. Yet, by negotiating they reached a consensus on how to proceed. The game designers developed it to be played in two 90 min classes separated by a day so that the players could negotiate outside of class if they chose to do so. The game was so successful as a learning and research tool that the Stanford Law School expanded it for use in an advanced class on negotiation.

[17]See Karl et al. (2007) and William Isaascs (1999), Dialogue and the art of thinking together: Currency (New York, London, Toronto, Sydney, Auckland), 428 p.

of all we must not be afraid to imagine what could be. Although the chapters in this book are diverse, as you read them keep in mind what we stated at the beginning of this introduction: The common thread through each of the chapters is the belief in the effectiveness of *people acting together—people having a conversation—* to achieve durable solutions for restoring lands.

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