Coexisting With Fire:

Ecosystems, People, and Collaboration

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Abstract

We are in a "fire crisis." Many regions of the world are experiencing larger, more frequent, and more severe fires that threaten people's lives, livelihoods, and properties, and the health of ecosystems. Regardless of the causes of this crisis — a common threat that crosses cultural and geographical boundaries — societies need informed and knowledge-based approaches to living with fire that lead to agreed upon success stories in sustainable fire management. Success will be characterized, in part, by the mutual support of people with diverse interests working through an adaptive and collaborative process.

Cover photo courtesy of Karen Wattenmaker

A Fire Crisis and More

The warning signs of a crisis are everywhere — massive wildland fires, loss of biodiversity, the spread of exotic invasive species, climate change, threats to human health, poverty, food and energy shortages, and loss of farmland. The list is large. If we accept that human well being is ultimately rooted in the condition of our global ecosystems, we must also acknowledge that sustainable living in fire-dependent environments is a social problem centered on people and communities.

Our challenge is to conserve and protect ecosystems for the long term[1]. *It is imperative that we think about how to live within the capabilities of our ecosystems, and that we avoid exploitation of local, national, and global resources to the point of loss of ecosystem functions and collapse of human societies*. In facing this challenge, we cannot deny the critical need for ecological stewardship[2]. Nor can we overly rely on improvements in technology to solve the looming problems of society and the global ecology. We need to critically consider major changes in our lifestyles, ways of thinking, and ways of doing business with one another, adapting our social and economic systems to make them more amenable to ecosystem sustainability. We need to work with ecological processes, not against them.

The oft-used Venn diagram illustrates an important point. Adapting socially and economically to the ecological capability of land requires realigning our social and economic needs to fit more closely with the land's ecological potential. Trying to adjust the ecology to fit our human needs has failed time after time, sometimes ruining both ecosystems and societies.

Adapting Socially and Economically Through Adaptive Learning Processes and Sustainable Collective Action

What is economically feasible?

What is socially acceptable?

Ecological capability of the land

Sustainability

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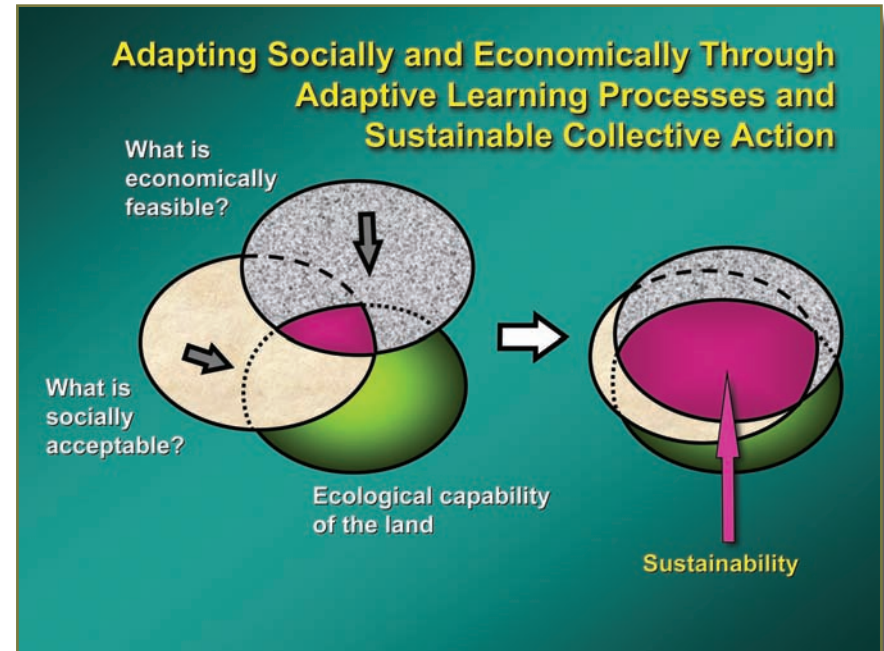
Our Challenge

The task of achieving ecological, social, and economic sustainability is so daunting that it is difficult to achieve consensus on what needs to be done. One place to begin is with a discussion of background about the relations between ecosystems, people, and fire. Our purpose is to demonstrate the importance of integrating the needs of fire as an ecological process with needs to reduce its threat to community well-being. We also demonstrate the importance of using collaboration to frame fire management goals and find socially acceptable solutions to conflicts between fire and people. These concepts and case studies, largely developed from our experiences in the United States and with an understanding of global contexts, may serve as a model for ecologically and socially acceptable fire management solutions in similar places around the world.

Both human health and ecosystem health vary dramatically around the world and within continents and countries. In many regions, a relatively stable relationship between people and ecosystems has existed for centuries or millennia. Often human influences have occurred for so long that today local ecology and human society cannot be separated. In other regions, human influences have been small or non-existent. In extreme cases, however, some ecosystems have collapsed entirely, often with disastrous consequences for human communities and cultures. With the dramatic increase in world population that has occurred in the brief span of a century, it seems probable that collapses of ecosystems and societies will continue, at least to some extent.

Due to our dependence on ecosystems, humans have a responsibility to understand their roles in protecting and maintaining them while simultaneously deriving a quality existence from them. Numerous studies and countless anecdotal stories that describe human relationships with ecosystems leave no doubt that human well-being depends explicitly on sustainable ecosystem services[3]. We can live in sustainable ways with ecosystems, or we can chance placing demands on ecosystems that overwhelm their functioning.

Sometimes we manage ecosystems for productivity or convenience, only to find that ignoring ecosystem function has consequences. Fire suppression and fire exclusion, for example, may keep valuable timber from burning and protect human life and property for a time, but removal of fire can also create conditions that make both ecosystems and people vulnerable to extreme fire behavior. An objective appraisal of the current global situation would reveal that in many cases, we are irreversibly changing ecosystems and depleting non-renewable resources. It has been argued that no amount of exploitation of non-renewable resources can sustain humans indefinitely.

The Colorado Front Range

A wind-driven fire in May 1996 was only the beginning. In a matter of hours, the Buffalo Creek fire burned an 11-mile swath through ponderosa pine/Douglas-fir forest in the Upper South Platte River watershed, leaving behind a 7,500-acre hole in the forest landscape and several burned houses. Weeks later, a thunderstorm caused flooding that killed two people, and erosion shut down two of Denver Water's three treatment plants for a week. Federal, state, and Denver Water folks recognized the continuing risk of more fires, erosion, and lives and property in the balance. These concerns led to the development of the Upper South Platte Watershed Protection and Restoration Project, with the primary intent of protecting a critical watershed and several local communities while practicing good ecology. New ecological research only a few miles away suggested that historically, a fire like Buffalo Creek would have been highly unlikely because historical forests were much less dense and contained older trees with fewer limbs near the ground. Additionally, the forest landscape was broken up with many small openings created by earlier natural fires. This research helped focus watershed protection efforts on treatments that were ecologically sound. Most of the forest was owned and managed by federal and state agencies and Denver Water, though protection of private land and property was also a significant goal. Initially, resistance to mechanical treatments of forests was great — some interest groups feared excessive logging on public land — yet, ecological research indicated that treatments could lead to good ecological outcomes. Gradually, the project objectives and treatment recommendations were endorsed and implemented.

Photo courtesy of the U.S. Forest Service

A bigger problem. Over the next 6 years, a series of other large fires occurred in the ponderosa pine/Douglas-fir forest zone of the Colorado Front Range, culminated by the massive Hayman fire in 2002 in the Upper South Platte watershed. These fires burned about 175,000 acres and several hundred homes and eight fire-fighters lost their lives. Yet a bullet was dodged — had the rapidly spreading Hayman fire burned a short distance farther north, thousands of homes would have been destroyed in a single day with untold loss of human lives. The pattern of severe, highly uncharacteristic fires was clear, and a new effort to address this expanding problem was formed — the Front Range Fuels Treatment Partnership. Team members from federal and state agencies were charged with facilitating treatments of forest lands. The team recognized that forest condition was a problem over a far greater area than just the Upper South Platte watershed and that vastly more resources were needed for treatments that lower the risk of such extreme fire events. But scaling up the effort faced significant complications. Much of the land likely to need treatment was privately owned and densely populated with mountain homes (often described as the wildland/urban interface). Projected treatment costs were huge, and the excess biomass that needed to be removed from forests had little commercial value. Industry infrastructure to implement treatments was nearly non-existent. Projected acres needing treatment for ecological restoration or community protection were unclear, and mistrust of government officials recommending unspecified treatments was always possible. The need for a broader solution was becoming clear.

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Ecosystems and Fire

The ecological role of fire in ecosystems around the world ranges from being a strong driver of ecosystem character to having no influence. *Fire dependent* ecosystems are those that have a long association with fire over time. In these places, fire is an essential ecological factor for the conservation of biodiversity when it occurs at appropriate times and levels of intensity (for example, African savannas and North American temperate coniferous forests). *Fire sensitive* ecosystems are those that have largely not developed in the presence of fire, and thus, introduction of fire is considered inappropriate and can have negative impacts on biodiversity (for example, Brazilian tropical moist broadleaf forests). *Fire independent* ecosystems are those that naturally lack sufficient fuel or ignition sources to support fire as an ecological process (for example, Middle Eastern deserts, Siberian tundra).

Over half of all terrestrial ecosystems worldwide are fire-dependent, and either the loss of fire from or the alteration of the ecological role of fire in these systems can threaten their long-term sustainability. At least 20 percent of terrestrial ecosystems worldwide are fire sensitive[4], and increasing industrial use of these ecosystems by people is resulting in more frequent fires with detrimental ecological and social effects. Clean air, clean water, and productive soils can be negatively or positively influenced by fire depending on how species respond to fire and on the frequency, season, and intensity of fire. The role of fire in many ecosystems around the world is poorly understood and not well recognized by many societies. Where the benefits of fire are recognized, the appropriate fire regime for the ecological conditions may be unknown. What we do know is that understanding the role of fire in maintaining or threatening ecosystems is critical to conserving biodiversity and sustainable living.

Photos courtesy of the U.S. Forest Service

People and Fire

The role of fire in human societies ranges from being a useful tool for managing the land for goods and services to a serious threat that can harm people and disrupt their livelihoods. The use of fire as a land management tool has long-standing cultural significance to many communities. In some regions, fire has been used for hundreds to thousands of years for hunting, cultivating desirable food plants, fiber and fuel, clearing for agriculture, improving forage for domestic animals, controlling pests, easing travel, and communication[5].

In many cases around the United States, people have changed the relationship between fire and ecosystems, often creating harmful effects. How we use and manage the land can alter fire regimes. Rural and urban development, agriculture, forestry, fire exclusion, invading non-native species, and climate change related to our human activities have put most of the nation's ecosystems at risk from altered fire regimes — either too much, too little, or the wrong kind of fire[6].

In the United States and other countries, decades of successful fire prevention and suppression have been linked to increased fuel loads and increased fire severity and frequency, which can preclude allowing fire to play its historical roles on the land. In spite of fire exclusion efforts, we have also seen increases in accidental fires that are associated with recreational activities and arson near human developments.

Fire exclusion near modern human settlements often causes increases in tree or shrub density. Such changes have been linked to uncharacteristically severe fires that have adverse impacts on human health and safety caused by smoke, water pollution, or flooding[7]. Experts have also shown that climate change related to human activities has likely changed fire regimes across many other ecosystems. Altered fire regimes can adversely impact economies, livelihoods, health, safety, and ecosystems. In our role as stewards of ecosystems, we need to critically consider the degree to which we can use and shape ecosystems while allowing ecosystems to function as they should in the long term.

Photo courtesy of the U.S. Forest Service

Diverse Perspectives, Complex Problems

As stewards of ecosystems, we require a more complete understanding of the human dimensions of living with fire. Applying principles of conservation biology and ecosystem management will remain important, but these are only part of the story. Living with fire embodies an array of competing social values, multiple interests, and uncertain outcomes of how we manage land and fire.

Coexisting with fire is contentious and complex because there are many diverse people, or stakeholders, involved with and affected by fire. We all have a stake in this problem. How we understand our differing situations and varying contexts determines the choices we make with respect to living with fire. Different people see issues of living with and managing fire through different lenses. For example, a forest ecologist studying a fire-dependent ecosystem may see the use of fire as a management tool quite differently than the people who live or work in or near the forest.

Social scientists in the United States have documented that people respond to fire events, fire management, and land recovery after fires in different ways depending on their values and beliefs about nature, their history in a certain place, and their attitudes toward how to manage the land on which they live. Differing explanations of how and why we should live with fire often compete and conflict, with no single correct solution. Our need and capacity to coexist with fire may best be defined and addressed on a case-by-case basis, but with an eye to the overall context.

Photos courtesy of the U.S. Forest Service

Thinking Adaptively, Working Collaboratively

Ecosystems were, and often still are, managed for one or several parts of the whole, such as optimizing timber production, conserving wildlife habitat, or excluding fires around development. In many cases, it has been documented that such focused approaches have resulted in alteration of ecosystem structure and function. Thus, we must think differently, and adaptively if we wish to succeed as stewards of the ecosystems in which we live. One way to accomplish this is through the use of adaptive management. This approach allows us to focus broadly on all aspects of ecological, social, and economic systems and their interactions. It also incorporates a feedback loop that facilitates our learning about the consequences of our management on ecosystems, thus providing guidance for change in our management strategies when necessary. Finally, it lends itself well to collaborative management approaches.

Our social, economic, political, and organizational wills must each play a role in embracing innovations for coexisting with fire-dependent ecosystems. To do so, we must base our thinking on respect for many different perspectives and diverse types of knowledge, and we must work collaboratively.

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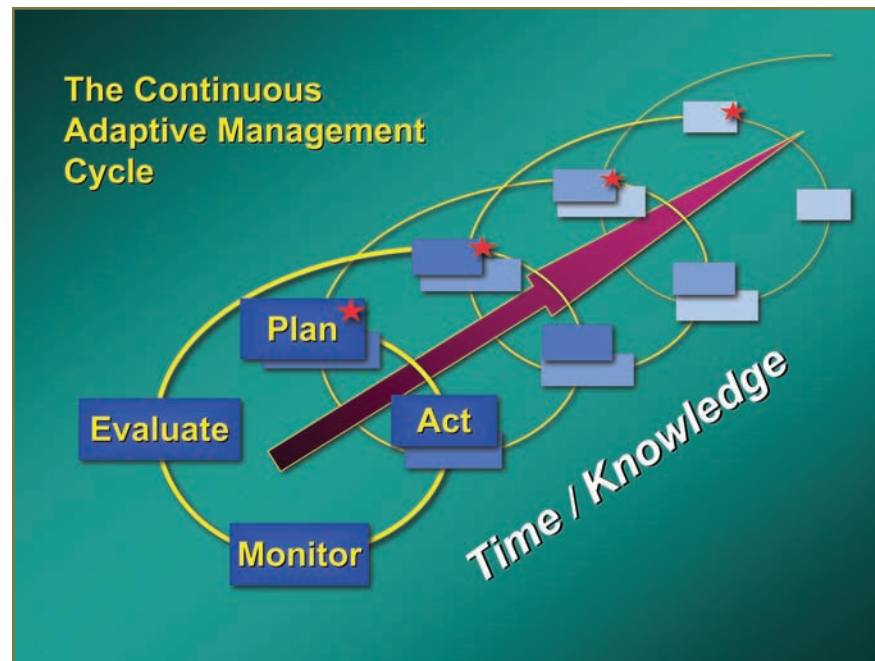
Knowledge and collaboration are never static. Both change with time, experience, and circumstances. We can increase our chances of improving the balance between ecosystems and people by using new scientific insights and by intensifying our efforts to achieve more inclusive and fair collaboration. This does not mean that we need complete scientific and practical understanding to begin. Even with incomplete knowledge, we can and must make progress, and future management actions are often enriched by knowledge that can only be gained by experience. Using an adaptive and collaborative process, stakeholders can create new knowledge of their roles in living with fire-dependent systems, and this new knowledge can be blended with scientific and practical knowledge to form a basis of agreement and new insights for collective action.

Documenting what various people believe about living with fire has largely been addressed by studying public opinion, or attitudes. Studies are sensitive to the type of people sampled, but in general, this approach tells us the proportion of people who agree or disagree with fire and land management options. Documenting attitudes has helped managers and researchers understand that people are indeed part of how fire is addressed in ecosystem management, but we need more. How we think about the human dimensions of fire must change and adapt as well.

Predicting behavior from people's attitudes assumes that we are rational, and like computers, we process information in linear and predictable ways. In this view of human dimensions, a person's attitude toward a management action, such as a prescribed burn, determines how he or she will react in the future in response to the burn. Based on this narrow assumption, we have made great efforts to "educate" individuals to increase, or engineer, social acceptance of contentious policies. This approach tries to persuade people to change their attitudes and behaviors in order to bring them in line with policies created by experts. However, there are times when attitudes do not translate into the behaviors we expect. Other factors can affect an individual's responses, such as what one's family or friends think he or she should support regarding fire or land management policies.

Educating stakeholders to sway their opinions oversimplifies the social complexities of coexisting with fire. Situational factors, such as how a fire started, whether property was damaged, risks to humans and wildlife, and how risks are mitigated, may all affect people's support for management actions. Persuasive messages are rarely received as the experts intended after being filtered through stakeholders' varying lenses or problem frames, which often differ from those of the experts. Coexisting with fire requires a shift in thinking away from persuading individuals to do what the experts think is right, to what stakeholder groups, including experts, mutually agree is good and appropriate.

We suggest that sustainable living requires creating ownership and shared understandings of the social problems that are occurring today in ecosystems across the United States and other countries. Living with fire in fire-dependent ecosystems can be thought of as a social problem that may best be resolved through adaptive and collaborative learning processes that enable stakeholders to act collectively. Collaborative solutions are not linear, nor are results accomplished quickly, but the results of collaborative learning will be better understood and longer lasting.

Photo courtesy of the U.S. Forest Service

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The Fire Learning Network Model of Collaborative Conservation

The U.S. Fire Learning Network (FLN) is a collaborative nationwide project of the U.S. Forest Service, U.S. Department of the Interior, and The Nature Conservancy. In existence since 2002, the FLN has networked over 100 landscape projects across the United States where tangible progress in landscape scale fire management planning is being efficiently achieved. These emerging success stories result from common partner goals for fire regime restoration and national and regional leadership in facilitation of collaboration, peer-review, and information dissemination across multiple landscape projects. The FLN consists of landscape-scale projects encompassing over 600 partners and over 78 million acres of high priority conservation areas in 36 states, on average encompassing 50% public and 50% private lands. In each of these projects, all stakeholders — from community groups to federal agencies — have learned how to work together to develop shared visions for landscape management, test assumptions about ecosystem structure and function, garner funding for implementation of priority actions, monitor on-the-ground outcomes, and learn how to overcome critical challenges related to the health of fire-adapted ecosystems and community well-being. In a recent survey, FLN participants identified the top three benefits of the network process: 1) increased success through peer learning with other landscape practitioners, 2) strengthened ecological foundations for management treatments, and 3) increased support by stakeholders for decision-making. The survey also revealed that the most common use of FLN products is found in prescribed burn, fire management, Forest and Resource Management, Community Wildfire Protection, and private ranch or forest management plans. Collectively across the nation, FLN partners have identified the top barriers to implementation, including the inability to get funding for implementation, an inadequate workforce capacity, and a lack of prioritization of restoration by agencies. Partners are working toward breaking these barriers through national facilitation, leveraging FLN seed funding, and cultivating collaborative partnerships. Since 2002, the FLN leveraging has added $15 million for implementing restoration actions on 560,000 collective acres.

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Coexisting With Fire Through Collective Action

Unilateral action, the opposite of *collective* action for addressing a social problem, is a no-win situation often leading to deep conflict and dysfunction among stakeholders — a situation to be avoided. Today, many social scientists think of collective action in terms of three broad and interconnected social processes that can enable people to work together to avoid no-win situations[8]. These include:

- Building relationships and the *capacity to collaborate*
- *Problem framing* — how people come to define living with fire
- *Mutual trust* that is built over time through positive public relations, inclusive discussions, and interactive communication and learning
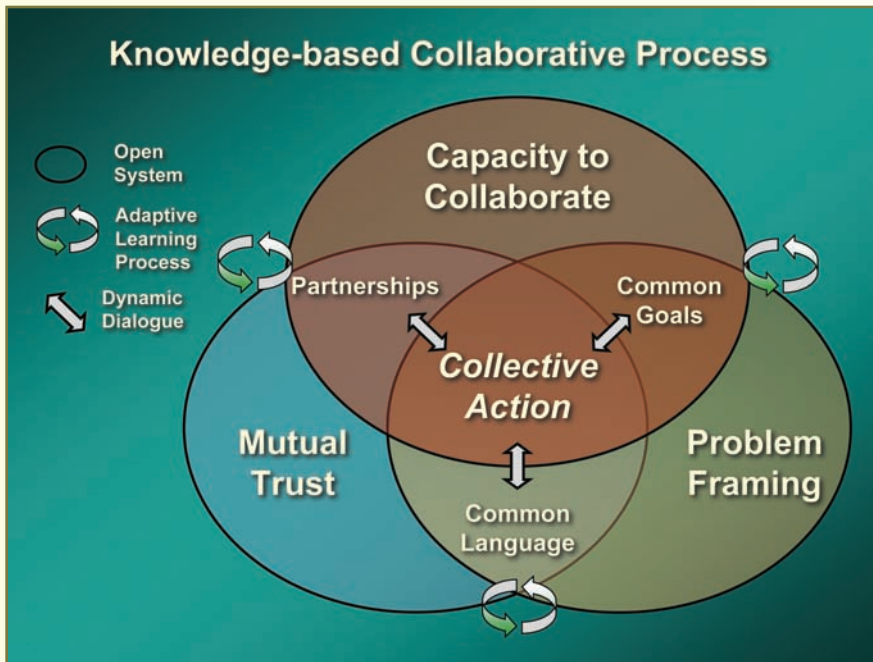
From an organizational perspective, capacity to collaborate means more than money, skills, and equipment. Collaboration means having a clear vision and strategy to enable relationship building, collective thinking, adaptive planning, and implementation. A collaborative *partnership* with self-organization and strong leadership has the ability to address local problems related to living with fire.

Problem framing accounts for the different ways that stakeholders see, or define, the problem and the language and concepts related to it such as ecosystem function and sustainability. Framing accounts for diverse public understandings, but people often have trouble seeing the same problem situation from another's frame of reference, which suggests a need to develop a *common language and common goals* for working together.

A partnership that communicates and sets objectives using a common language can develop mutual trust among its members and other potential partners. Mutual trust is built on respect and tolerance for different ways of seeing a situation, and it can develop over time through fair, inclusive, and interactive communication and learning processes. Research knowledge often can provide a foundation for building agreement and trust.

The areas of overlap shown in the collaborative process diagram illustrate relationships between these important social processes. The central area of overlap indicates collective action, which should be the goal of collaboration. Collective action requires development and integration of partnerships, common goals, and a common language. As knowledge evolves over time through these processes, stakeholders can learn how to collectively address the difficult problems they face living in fire-dependent ecosystems.

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Linking Ecology and Collaboration

What do we need to do to coexist with fire-dependent ecosystems? First, we should recognize and acknowledge the need to develop new ways of addressing ecosystems, people, and fire collectively. Second, we need to practice ecosystem management and human interactions based on unifying principles that draw ecosystem management and collaboration together. There are several parallels to be drawn between a number of common principles that have emerged from the study of conservation ecology and collaboration:

Save all the pieces. Ecosystems must have the potential for maintaining all the native organisms (including people) and the interrelationships among organisms, communities, and the physical environment that supports them. Similarly, collaboration must **save all the players**. That is, a collaborative partnership has to include a diversity of stakeholders and actively seek new members as the partnership learns new knowledge and adapts its actions to changing situations on the ground.

Save all the processes—ecological and social. Ecosystem processes, including the frequency and intensity of these processes, should be retained to allow ecosystems to self-regulate. The social processes involved with collaboration should likewise be retained so that the social system can adapt to changing conditions. These include, but are not limited to, building relationships and networks among partners, developing common goals, establishing leadership and mutual trust, developing shared definitions of problems, and encouraging interactive communication and engagement among stakeholders.

Think long term. Ecosystem processes and collaboration both take time, and sustainability involves accommodating changes over time. Managing ecosystems and engaging in collaboration that is sustainable must follow a long-term vision that may include learning from history and past mistakes. Solutions and successes are temporary and specific to situations and places. An adaptive approach to collaborative fire and ecosystem management helps accommodate the critical element of time.

Think large and small spaces. Our environment exists at multiple levels of organization, from individual organisms, communities, populations, and ecosystems, to global biomes. Land management problems often arise from incongruence between the scale of management and the scale of the ecosystem process of concern. Misunderstanding the scale of the fire regime or the scale of land use policy can lead to disruptions of ecological processes. For example, when people locally alter fire-dependent ecosystems, migratory species dependent on those ecosystems can be seriously affected. Collaborative processes also function at multiple levels, from groups to communities to nations to federations of nations. Taking management action to coexist with fire is a social process that occurs at these different levels of human organization. To properly manage ecosystems, we must work to integrate collaboration across these varying levels of scale.

Components of Collaboration that Facilitate Collective Action

Partnerships
➢ *Long-term, committed relationships that have:*

- Developed over time
- Collective identity
- A sense of community
- Strong leadership
- Sustainable objectives

Common Goals
➢ *Shared understandings and a guiding vision of:*

- Future desired conditions
- Acceptable management practices
- Successful outcomes

Common Language—*Framing*
➢ *Shared definitions of:*

- Fire management
- Fire and its roles
- Ecosystem/human community health and well-being
- Sustainability
- Restoration
- Success

Common Language—*Trust*
➢ *Public relations and inclusive/interactive communication that enables:*

- Adaptive co-learning *not* persuasion
- Open discussion
- Listening
- Credibility
- Respect for differing frames

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The Collaborative Global Fire Partnership

The Nature Conservancy, World Conservation Union (IUCN), University of California, Berkeley Center for Fire Research and Outreach, and World Wildlife Fund (WWF) have joined forces to engage hundreds of scientists, managers, and policy-makers in the assessment of fire's role in biodiversity conservation worldwide. Through the partnership's ongoing Global Fire Assessment, scientists, practitioners, and policy-makers collaboratively identify common strategies to allow fire to play a role in places where it benefits ecosystems and people and keeps fire out of places where it is destructive. The Assessment has identified global and regional patterns in how fire regimes are altered and what is needed to successfully integrate ecological and social systems. The top human activities that impact the ecological role of fire regimes, in order of area impacted globally, include:

- **Ecosystem Conversion** — the use of fire in land clearing and management for livestock farming, ranching, and agriculture that directly threatens fire sensitive systems and fragments all ecosystem types.
- **Energy Production and Mining** — the expansion of energy and mining, which often leads to increased human-caused ignitions or fire exclusion to protect energy and mining activities.
- **Fire and Fire Suppression** — the direct exclusion of fire from fire-dependent ecosystems or introduction of fire by humans where it is ecologically detrimental.
- **Rural and Urban Development** — human housing and industrial development, which often leads to exclusion of fire for community protection or an increase in human-caused ignitions relative to natural fire dynamics.
- **Fire Management Capacity** — the adequacy of qualified staff and training opportunities to address altered fire regimes.
- **Traditional Fire Use** — conflicts between traditional uses of fire and needs to maintain or restore native fire regimes.
- **Climate Change** — climate, and how it changes, is a strong driver of fire behavior.

Underlying all of these threats are the **national and multilateral fire management and land use policies** that disable our ability to maintain or restore the role of fire in ecosystem function. Collaborative understanding of the effects of policies, human activities, and fire management capacity on the ecological and social role of fire is the first step toward ensuring that decision- and policy-making is ecologically and socially appropriate.

Implications From Local to Global

We are all in this together. Just as climate change is a global issue[9], so too are the ways we understand and conserve our ecosystems. Fire-dependent forests, shrublands, and grasslands respond directly to human land management decisions everywhere, even if social choices or needs driving land management policies and practices differ locally or regionally. We benefit from actions at any scale that are directed toward protecting and restoring fire-dependent ecosystems and the ecological processes that keep them sustainable. However, many of the issues associated with protecting and improving these ecosystems call for integrated efforts across multiple spatial scales, social levels of organization, and jurisdictions. We have an opportunity, and an urgency and responsibility, to rise to this challenge.
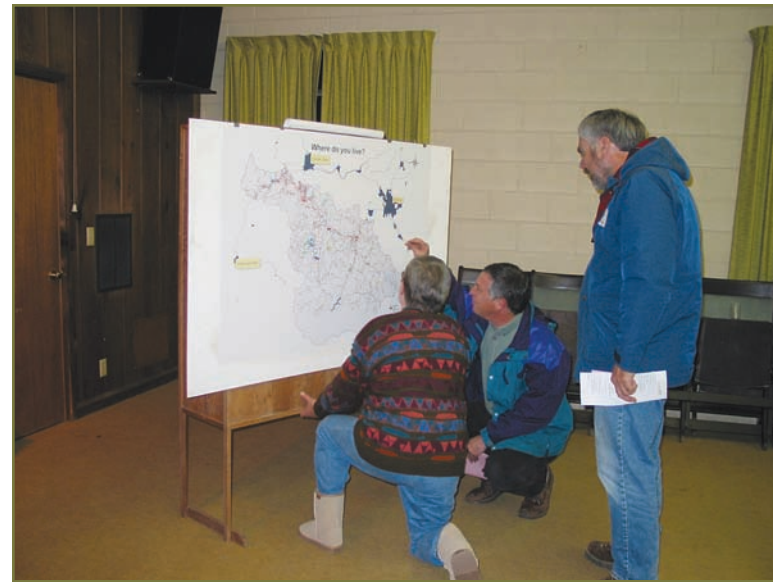

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A Call to Action

As ecosystem stewards, our goal must be to ensure that people can effectively coexist with fire while also meeting social and ecological needs. To begin to realize this goal, we need to work collectively toward shared understandings and then develop action plans to address a number of key problem areas:

- Strive to understand the **nature, degree, and extent of human impacts** on conserving the role of fire in ecosystems at multiple scales, including any effects of traditional relationships between people and fire.
- Use knowledge, both scientific and traditional, to more completely **integrate native fire regimes** into the design needs of human developments and land uses.
- Proactively **engage and partner with diverse stakeholders** in all fire management, land use, conservation planning, and development activities.
- Identify **key barriers to conserving the role of fire** in ecosystems or abating fire as a threat to ecosystem functions, including ecologically inappropriate fire and land use policies, lack of funding, capacity, or expertise, and lack of knowledge about fire's ecological roles on the part of the public and decision-makers.
- Develop and implement **collaborative, innovative solutions** that take advantage of partnerships, shared resources, and expertise across landscapes, countries, and regions.
- Sustain the effectiveness of collective action through **adaptive learning** processes that engender trust, relationship building, and commitment to sustainable living.

Photo courtesy of the U.S. Forest Service

A Roundtable Process in the Colorado Front Range

The expanding problems of protecting and restoring forests and human values at risk in Colorado were much larger issues than the Front Range Fuels Treatment Partnership team could address by itself. Treatment planning required far more ecological information, vastly more financial resources for treatments, political support, and feedback from many more stakeholders and potential partners regarding human reaction and support for such a massive effort. With the encouragement of the partnership team, a broader interim planning group formulated a roundtable process that was focused on developing a vision and roadmap for restoring forest health and protecting communities in the Colorado Front Range (covering about 6 million acres). The need to be inclusive was recognized as critical. The Front Range Roundtable included representatives from every significant stakeholder interest group, including environmental organizations, state and federal agencies, state and local community leaders, the academic/scientific community, and user group/industry leaders. The breadth of representation and importance and scope of the issues created a dynamic that encouraged intensity and passion among participants. Nearly 30 roundtable member organizations convened for meetings over a 2-year period, with dozens more individuals contributing to working groups focused on ecology, economics, action and policy, and community outreach. The Front Range Roundtable produced a series of 10 initiatives and recommended actions spanning four priorities — increasing funding, reducing cost of treatments, ensuring local leadership and planning, and setting priorities for progress toward common goals. The issues have been framed; the next steps will determine true success — improved ecology and safer communities in the Colorado Front Range.

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