An Introduction to the Yellowstone Ecosystem Management Debate
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Ever since the year 1872, when Congress designated Yellowstone National Park as the world’s first national park, the name Yellowstone has been synonymous with lofty idealism and often heated controversy. And since 1891, when President Benjamin Harrison established this nation’s first national forest reserve adjacent to Yellowstone National Park, the entire Yellowstone region has been a principal battleground over federal land and resource management policy. Although the passage of time has more than validated the wisdom of these early designations, debate over how these lands are to be managed has escalated into a symbolic issue of national and international significance. Indeed, a controversy like the one surrounding the summer 1988 fires illustrates the scientific, philosophical, legal, and economic complexities confronting today’s land managers, who are responsible for maintaining the Yellowstone domain in the face of a growing population with increasingly diverse expectations and values.

At one level, the Yellowstone controversies are focused on the National Park Service’s management policies, particularly its commitment to letting natural processes prevail on park lands. This conflict is illustrated by the
current debate over the park’s policy of permitting natural fires to burn and its commitment to restoring wolves. At another level, the controversies involve the appropriate level of development on the public and private lands surrounding Yellowstone and Grand Teton national parks. In the national forests, these controversies focus on such issues as wilderness designation, oil and gas exploration, timber harvesting levels, and livestock grazing allotments. On the private lands, the controversies involve the level and intensity of development appropriate to the surrounding natural setting.

To regard these issues in isolation or as unrelated matters, however, would be a mistake. Park Service management decisions, whether involving resident wildlife or natural fire, have profound influences on surrounding communities and neighboring landowners. Similarly, the U.S. Forest Service’s wilderness designation, mineral leasing, timber harvesting, and grazing policies have significant environmental consequences for wildlife and adjacent park lands, as well as economic repercussions within nearby communities. In fact, almost all of the Yellowstone region lands are ecologically interconnected in complex and dependent relationships, just as the local economies are directly connected to the surrounding public lands and resources. Because the same issues are surfacing across the nation’s public domain, the resolution of Yellowstone controversies will have a pronounced influence on how similar problems are addressed elsewhere in the United States and throughout the world. In short, the Greater Yellowstone public lands represent a test case or paradigm for redefining mankind’s role in wildland areas of ecological importance.
ECOLOGY AND ECONOMICS

The general public tends to regard the Yellowstone region as essentially one large national park, but the regional landownership and management pattern is actually quite complex. The National Park Service and the U.S. Forest Service are the principal landholders in what both agencies now refer to as the Greater Yellowstone Area. According to them, Greater Yellowstone encompasses more than 7.3 million hectares (18 million acres) of public and private lands located in the states of Wyoming, Montana, and Idaho. It includes two national parks (Yellowstone and Grand Teton), portions of six national forests (the Bridger-Teton, Shoshone, Targhee, Gallatin, Custer, and Beaverhead), three national wildlife refuges (National Elk Refuge, Red Rock Lakes, and Grays Lake). Bureau of Land Management landholdings, and state and private lands. National park lands and Forest Service wilderness areas total approximately 2.5 million hectares (6 million acres) and account for nearly half of the federal land base. The Forest Service manages its wilderness lands under a preservationist mandate designed to minimize intrusive human activity, whereas the Park Service is obligated both to preserve its lands and to provide for public enjoyment. a dual mandate that has historically found the agency wavering between its two obligations. The nonwilderness national forest lands, which also total approximately 2.5 million hectares (6 million acres), are managed under a "multiple-use" mandate, which provides for logging, mining, grazing, and recreational activities as well as wildlife and watershed protection. The region’s remaining land is mostly in state or private
ownership; it is generally not governed by federal law and is open to
development.

Yellowstone and Grand Teton national parks are at the center of a vast complex of designated and de facto wilderness lands that constitutes one of the largest conglomerations of wildlands left in the United States. Environmental groups and most biologists regard this park-wilderness complex as the core of a regional ecosystem characterized by a rich diversity of wildlife and manifold natural wonders. The largest elk herds in the world reside in Greater Yellowstone, as does one of the world’s few remaining free-roaming bison herds. The region provides critical habitat for such rare or endangered species as the grizzly bear, whooping crane, bald eagle, peregrine falcon, and trumpeter swan. The world’s largest undisturbed geothermal region, which has dramatically shaped the Yellowstone landscape, is an integral part of the ecosystem. The Greater Yellowstone watershed includes the headwaters of three major river systems, the Snake-Columbia, the Green-Colorado, and the Yellowstone-Missouri. The region’s vegetation is predominantly lodgepole pine and spruce forests, which blanket much of the high mountain plateau. As a relatively untouched wilderness environment, Greater Yellowstone provides scientists with an unparalleled opportunity to study and understand how natural systems operate.

This Greater Yellowstone ecosystem cannot be easily defined by boundary lines of any lasting significance. Neither the wildlife for these natural features are confined to the national parks. Many species range well beyond park borders to meet their seasonal habitat needs, just as the geothermal aquifers, river systems, and forests extend far beyond the parks. Congress.
when it initially established park boundaries, was preoccupied with preserving Yellowstone’s geothermal curiosities; it lacked any knowledge or appreciation of ecological realities. Now that ecological connections between the national parks and surrounding lands are better understood, environmental groups and others have begun calling for an ecosystem-based approach to public land management. Noting that the 1988 summer fires ignored political boundaries, just as the elk and bison have perennially relied on seasonal habitat far beyond park boundaries, environmentalists argue that the Yellowstone region properly should be labeled the Greater Yellowstone Ecosystem and managed as an integrated ecological entity. This type of management, they assert, should protect the region’s world-renowned natural features and emphasize its amenity values, such as wildlife protection, recreational opportunities, and aesthetic vistas.”

Since the early settlers arrived more than a century ago, people have become a ubiquitous presence throughout the Yellowstone region. Some of the initial inhabitants carved ranches and farms out of the wilderness, others sought their fortune in mining, and still others logged the forests for their livelihood. These early economic activities, which largely relied upon public domain resources, continue today, with oil and gas exploration joining hard-rock mining as an important mineral development activity. In addition, tourism has become a major industry throughout the region, and recreational use of the public lands has increased dramatically.

During the summer months, several million visitors descend on the national parks, swelling the local population to more than ten times its normal size. And the tourist season is now extending through the winter months, with
park visitors, skiers, and snowmobilers all seeking access to what had previously been an undisturbed winter landscape. The surrounding states and local communities are heavily dependent on the region’s public lands for their economic sustenance. Wyoming’s Governor Michael Sullivan candidly acknowledges the Yellowstone region’s "immense importance" to his state. He undoubtedly also speaks for his counterparts in Idaho and Montana when he observes that "tourism, minerals, timber and agriculture-related businesses rely upon the resources in the Yellowstone area and local communities rely upon the revenues produced by those businesses." The states derive significant tax revenues from natural-resource development activities and sales tax receipts; local communities benefit directly from revenues generated by timber harvesting and grazing. The state of Wyoming, for example, derives 70 percent of its tax base from mineral extraction, some of which occurs on the public lands in the Yellowstone region. The Wyoming legislature, recognizing the state’s strong interest in its public lands, recently adopted legislation establishing a federal lands coordinator position in the governor’s office to ensure that the state’s interests are represented before the federal land management agencies.

The nonwilderness public lands in the Greater Yellowstone region are managed under the multiple-use principle and thus are available for resource extraction activities, such as mineral exploration and timber harvesting. Geologists believe the Overthrust Belt, which extends into the Yellowstone region and contains significant oil and gas deposits, holds real promise for further discoveries. A productive natural-gas field has been
developed in the southern portion of the Bridger-Teton National Forest, and exploration activity is contemplated throughout the Yellowstone region. Noting the continuing decline in the nation’s petroleum supplies, oil company executives argue that the key to enhancing domestic production and guaranteeing the nation’s energy security is further exploration on previously unexplored lands in the Yellowstone region and elsewhere. Since park and wilderness lands are off limits for exploration, the oil companies have sought exploratory drilling rights on the remaining public lands. In response, the Forest Service has undertaken an extensive leasing program, while providing for pre-lease environmental review and by imposing some restraints on development. The oil industry, however, has objected to some of these constraints, claiming a legal right to explore on leased lands. Environmentalists have responded that broad-scale oil and gas activities are fundamentally incompatible with the natural setting and threaten important wildlife habitat and water quality.

Over the years, the timber industry has actively logged throughout the Yellowstone region national forests. Logging provides employment opportunities, usually at high-paying wages, in an often depressed local economy. Timber sales return some revenue to the federal treasury, generate important tax revenues to the local counties, and provide some degree of local economic diversification. According to the Forest Service and timber company executives, timber harvesting is a useful resource management tool; it can minimize insect damage and disease in the forests, diminish the impact of fires, enhance wildlife habitat, and increase water yields. In addition, logging roads provide recreational access to the forests
and enable fire fighters to reach potentially dangerous forest fires. But environmentalists contend that extensive logging and the accompanying road construction threaten wildlife habitat, water quality, and the aesthetic appearance of the forests. They also note that revenues from timber sales usually do not offset the Forest Service’s timber management costs.

The livestock industry also depends on the Yellowstone region public lands for seasonal grazing. Cattle and sheep ranches are scattered throughout the region, and ranching remains a traditional way of life for many longtime residents. The grazing fees these ranchers pay for access to the public domain provide the Forest Service and local communities with some revenues, though critics complain that public grazing fees do not reflect the prevailing market price. The region’s expansive ranch lands contribute to its bucolic and rural appearance. Dude ranching and horsepacking have become a tourist attraction and an additional source of income for some ranchers. But livestock do not mix easily with Greater Yellowstone’s free-roaming wildlife, and intensive grazing has caused environmental harm on the public lands. Nearly 40 percent of occupied grizzly bear habitat on the public domain is leased for livestock grazing, and several of these areas have become mortality sinks for the bear. Livestock and wildlife conflicts are intensifying on critical winter-range lands, where native wildlife are competing with cattle for scarce forage. Because bison and elk are known to carry brucellosis, a disease causing spontaneous abortion in cattle, ranchers are intent on keeping these animals away from their herds; they have pressured local politicians to sanction hunting both within and outside the national parks. Unsupervised livestock grazing also has caused dam-
age to riparian areas and eroded stream quality in the Greater Yellowstone forests. Moreover, recreational conflicts between people and livestock are growing as more backcountry users find their solitude disturbed by grazing cattle and sheep.

With employment opportunities in the local communities linked to the public domain, there is little consensus on how the Yellowstone region public lands should be managed. Some local residents, joined by groups such as the Wyoming Heritage Society and the Multiple-Use Land Alliance, believe that an emphasis on preservation could preclude important economic activity and cause severe dislocations. Acutely aware of the legal significance of current boundary lines, they have taken the position that commodity development activities should continue as usual in the Yellowstone region national forests and that management policies in the region’s national parks should be directed toward promoting human use and enjoyment of these areas. They note that the town of Dubois, Wyoming, lost more than 150 jobs when the Louisiana-Pacific lumber mill, the town’s largest employer, was forced to close its operations because it was unable to purchase timber in the heavily logged northern section of the Bridger-Teton National Forest. They also observe that jobs in the resource extraction Industries, even though they tend to follow boom and bust cycles, usually pay high wages. And they argue that state and local governments, as well as the federal treasury, derive important tax revenues from mineral development activity, timber harvesting, and livestock grazing fees.

Other residents, joined by national and local environmental organizations, believe that federal land managers should give priority to the region’s
environmental and amenity values. Indeed, the communities and businesses that depend directly upon Greater Yellowstone’s scenery, wilderness, and wildlife for economic sustenance view the public domain as a valuable resource in its undeveloped state. Becoming quite sensitive to the ecological conflicts is vital to preserving the region’s natural integrity, they have weighed into the current debate over wilderness designation in Idaho and Montana, supporting proposals to expand wilderness protection, and they have mounted intense opposition to the Forest Service’s oil and gas leasing policies. They applauded the Forest Service’s decision to stop logging in the northern Bridger-Teton National Forest, which was reached after the agency concluded that extensive logging was diminishing critical wildlife habitat and compromising important recreational values. Pointing to recent data indicating that tourism and recreation account for substantially more jobs and income in the region than the resource development industries, local officials in Teton County, Wyoming, argue that recreation and tourism can provide a permanent and stable foundation for the regional economy. And they note that Teton County already has developed a comprehensive land-use plan limiting development on private lands (which constitute only 3 percent of the county’s land base) to ensure environmental protection and scenic preservation.

The formidable task confronting public land managers in Greater Yellowstone is how to protect the region’s natural values while also accommodating human interests and economic activity. Answering this question raises difficult scientific, philosophical, legal, and economic issues. The scientific issues focus on the need to develop a comprehensive understand-
ing of ecological relationships throughout the region as well as a better understanding of the cumulative impact that development activity has on the region’s ecological systems. These issues are pushing scientists beyond the bounds of current knowledge, as illustrated by the unpredicted magnitude of the 1988 fires, the ongoing research into elk ecology on Yellowstone’s northern range, the efforts to develop and refine computer models for evaluating grizzly bear habitat requirements, and the current studies seeking to predict the impact of a reintroduced wolf population. The philosophical issue is whether public lands and resources should be managed to give priority to nature or exploited and developed for human benefit—a long-standing point of conflict between preservationist and utilitarian schools of thought. The difficult legal question is how to reconcile fundamentally different legal mandates and policies when official decisions are likely to have adverse environmental or economic impacts on nearby resources, lands, and communities. The economic issues are challenging public officials to devise resource management plans that will preserve the natural integrity of the region but also provide sufficient economic opportunities to sustain local economies and ensure a reasonable return to the federal treasury.

THE VIEW FROM THE LAND MANAGEMENT AGENCIES

Initial answers to these dilemmas must come directly from the National Park Service and the Forest Service. From the Park Service’s perspective, its policy goals are to protect the region’s natural character and to maintain natural processes. It is committed to continuing its experimental manage-
ment regime, which now focuses on the ecosystem as a whole rather than on single species that traditionally dominated management efforts. Park Service officials believe that Yellowstone’s uniqueness and its historical legacy compel them to test the natural-process management hypothesis as well as other management theories. And, recognizing that public and private lands throughout the region are inextricably intertwined, the Park Service is convinced that Greater Yellowstone can best be managed by giving primacy to "protecting the integrity of the natural systems that are the area’s single most important resource." Although this "does not mean that other uses must be totally excluded" from the lands surrounding the parks, it does reflect the Park Service’s belief that "a healthy Yellowstone ecosystem will benefit the regional economy most in the long run."

Yellowstone’s superintendent recently framed the issue in these terms: "Are the immediate or short-term gains had by a relatively few people near the park worth the loss the world will feel if America loses the grizzly bear in Yellowstone or permits the park’s geysers—some 60 percent of the world’s geysers—to suffer irreparable harm?" Fearing the gradual erosion of the region’s natural integrity, the Park Service views Greater Yellowstone as an opportunity to design "an international model of far-sighted planning."

Not surprisingly, Forest Service officials do not place the same emphasis on Greater Yellowstone’s natural values. Instead, they emphasize that the regional conflicts reflect "intense competition for the unique and scarce products and experiences the area offers" and that the controversies can best be understood as a conflict between widely divergent "public val-
ues." Rather than underscoring the region’s natural attributes or ecological connections, they argue that Congress intentionally has given the Park Service and the Forest Service different mandates, and that "there is strength through diversity" in each agency’s separate mission and philosophy. The Forest Service thus takes the position that no one mandate or philosophy should prevail in setting the Greater Yellowstone management agenda, and that the agencies should view "coordination as a key to making diversity a strong concept." Recognizing that "our society is changing rapidly," they believe that resource managers "must respond to public values" while staying "better tuned into the social-political realities of our dynamic society."

In spite of these somewhat divergent positions, the Park Service and the Forest Service are actively seeking common ground in the Yellowstone region. Acting through the Greater Yellowstone Coordinating Committee, an administratively conceived group composed of the principal regional and local management officials, the agencies have initiated a cooperative interagency effort to resolve their shared problems. The GYCC characterizes these unprecedented coordination efforts as "the precursor of future land management throughout the country." Thus far, the agencies have designed a unique "process" for addressing resource management conflicts and establishing coordination standards. The first phase of this process culminated with publication of "An Aggregation of National Park and National Forest Management Plans," which inventories resources and compares resource management provisions. The second phase, which is the real heart of the coordination effort, involves drafting a "Vision for the
Future” document. This document will identify important characteristics of the Yellowstone area, establish “a series of related goal statements,” and then articulate "coordinating requirements, standards and guidelines, to support and implement each goal." Utilizing this document, each agency will review and amend its regional guidelines and local management plans to ensure meaningful coordination. This process has been open to the public, and the ovcc plans to draw on public comments to frame its conception of future management goals and priorities.

The Greater Yellowstone land management agencies did not easily or willingly arrive at this point. A 1985 congressional oversight hearing on management in the Yellowstone region, augmented by a highly critical report prepared by the Congressional Research Service, raised troubling questions about current management directions and an apparent lack of communication and coordination among the agencies. The CR5 report concluded that extensive commodity development activity and accompanying access roads cumulatively were causing adverse environmental impacts and threatening wildlife populations. It also concluded that recreation was the most important economic activity in the region, but that it received inadequate attention from the agencies. Moreover, the report reached the startling conclusion that the grizzly bear’s survival was in jeopardy.

Facing the threat of congressional intervention, the agencies revitalized the GYCC and have begun addressing the coordination problem as well as their own management priorities.

Administratively, the Park Service and the Forest Service are moving toward the concept of ecosystem management for the Greater Yellowstone
region. The GYCC’S efforts in bringing its "Vision for the Future" document to fruition reflect an unprecedented level of cooperation between two agencies that historically have distrusted each other. The draft "Vision" document sets forth a clear commitment to preserving Greater Yellowstone’s sense of naturalness and ecological processes, while contemplating future economic development that is consistent with this commitment to the region’s natural values. The draft document envisions "a landscape where natural processes are operating with little hindrance on a grand scale. . . . [The overriding mood of the GYA [Greater Yellowstone Area] will be one of naturalness, a combination of ecological processes operating with little restraint and humans moderating their activities so that they become a reasonable part of, rather than encumbrance upon, those processes.” In addition, the Forest Service, though reluctant to accept explicitly the notion of ecosystem management, is beginning to emphasize wildlife preservation, recreational opportunities, and other amenity values on individual forests within Greater Yellowstone.

The GYCC’s initial coordination efforts, however, have done little to satisfy its critics. Environmentalists, pointing to the lack of legally binding commitments, remain concerned that the region’s natural values will ultimately be sacrificed to ensure access to minerals, timber, and forage on the national forest multiple-use lands. Conversely, the timber industry, ranchers, and oil and mining companies fear that coordination will inevitably preclude access to the region’s commercially valuable natural resources, generally limit human activity to protect natural features and wildlife species, and ultimately impose constraints on the use of private
property. Noting the potential for significant controversy and calling for prudence from the GYCC, Wyoming’s Governor Sullivan observes that "Congress, in its ultimate wisdom and over much time, has found no single legislative panacea that will solve every management issue in the [Yellowstone region." Sullivan is concerned that the GYCC, with its commitment to revising management plans that are the product of much public input and political compromise, "must tread the very fine line between setting policy and implementing policy."

A PREVIEW OF THE FUTURE

In one form or another, public land management disputes have mirrored the inherent tension between preservationist and utilitarian beliefs ever since Congress began establishing the nation’s public land policies nearly a century ago. Yet the controversies engulfing the Greater Yellowstone region are not being addressed in the same manner that earlier ones were. Modern ecological knowledge has changed the terms of the debate, auguring a fundamental reorientation in public land management policy. Indeed, a revised preservationist ethic is displacing the ethic of consumption that has historically determined public lands management policy, and it is now rising to a dominant position on the Greater Yellowstone public domain. This revised preservationist ethic is based on the principle of preserving ecological components and processes on a system-wide or ecosystem scale. Forty years ago, Aldo Leopold brilliantly laid the philosophical foundation for this development in his Sand County Almanac essays, where he argued that land management policy should be based on a "land ethic" designed "to preserve the integrity, stability, and beauty of the biotic community."
Today, in Greater Yellowstone, there is evidence that this notion of ecosystem-based management is being taken seriously and that traditional management priorities are being rethought.

The chapters that follow in this section are intended to provoke further discussion and debate about these developments and the future of the Greater Yellowstone region. They reflect the diverse views of scientists, lawyers, and an economist who have studied the region. Collectively, the authors ask and answer a plethora of provocative questions underlying the complex policy issues now confronting the land management agencies.

Can Greater Yellowstone be regarded and defined as an ecosystem? Is the Park Service’s natural-process management policy scientifically justified and ecologically viable? Can recreation compete with timber as an economically viable use of national forest land? Is there a legal basis for giving primacy to the Park Service’s preservationist mandate? Is the GYCC, with its regionalism initiatives, operating within the bounds of current law? Can the legal system be revised to take account of natural resource systems?

Although definitive conclusions are elusive, it is clear that the Greater Yellowstone region is in transition. Park and forest management policies are being reconsidered in light of ecosystem realities, jurisdictional boundaries are fading in importance, and hard questions are being asked about regional economic priorities. But it remains to be seen whether the agencies can overcome local political realities as well as their own institutional traditions to promulgate and implement meaningful ecosystem management policies. In the meantime, the current administrative initiatives have
legitimized Greater Yellowstone as an ecological unit as well as the concept of ecosystem management as a natural resource management principle. The beginnings of a new era in Greater Yellowstone are indeed becoming evident.