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BOOK REVIEW

THE GREATER YELLOWSTONE ECOSYSTEM: REDEFINING AMERICA'S WILDERNESS HERITAGE edited by Robert B. Keiter and Mark S. Boyce with a foreword by Luna B. Leopold. New Haven and London: Yale University Press, 1991. Pp. 428.

Yellowstone National Park conjures images of majestic mountains jutting up from valley floors, bison peacefully grazing across windswept plains and Old Faithful delighting tourists. Considered the crown jewel of the National Park System, Yellowstone represents one of the last areas to escape the explosive development of the twentieth century. Yet, as this collection of articles squarely addresses, this serenity is quite deceptive. Editors Robert B. Keiter and Mark S. Boyce aptly illustrate how under a peaceful facade lie fundamental questions involving economic, scientific, and political conflicts that threaten the Greater Yellowstone Area. The articles set forth, in an easily read style, the salient issues currently affecting the management of Yellowstone. This book review summarizes the main topics addressed by the articles.

BACKGROUND

The opening articles sketch the history of Yellowstone National Park beginning in 1872 when Congress established it as the world's first national park.¹ Since that time, the protected area has expanded to include two national parks (Yellowstone and Grand Teton), six national forests (Beaverhead, Bridger-Teton, Custer, Gallatin, Shoshone and Targhee), three national wildlife refuges (National Elk Refuge, Red Rock Lakes, and Grays Lake), and other state and private lands. Together these areas total over eighteen million acres of land in Wyoming, Idaho and Montana and comprise the Greater Yellowstone Area (GYA).² Within this web of political subdivisions exist various and often conflicting agendas.

The two primary actors within the GYA are the National Park

1. Robert B. Keiter, *An Introduction to the Ecosystem Management Debate*, in THE GREATER YELLOWSTONE ECOSYSTEM 3 (Robert Keiter & Mark S. Boyce eds., 1991); Duncan T. Patten, *Defining the Greater Yellowstone Ecosystem*, in THE GREATER YELLOWSTONE ECOSYSTEM *supra*, at 19; John J. Craighead, *Yellowstone in Transition*, in THE GREATER YELLOWSTONE ECOSYSTEM *supra*, at 27.

2. Keiter, *supra* note 1, at 4.

Service and the National Forest Service, each with its own distinct objectives and agendas.³ The Park Service aims to protect the region's natural character and to maintain natural processes. Inherent within those objectives of the Park Service is an ecosystem-based management policy that views the Park not as a static environment within artificial political boundaries, but rather an evolving and ever changing system of relationships between the land, climate, plants, and wildlife. The Forest Service manages its land less in terms of nature and more in terms of economics. Under a mandate of "multiple use," the Forest Service grants leases for timber, oil, gas, open pasture grazing, and mineral exploration.⁴ Despite the immense amount of land in the GYA, conflicts between the two Services abound where the actions of one directly affect the other. The Services' competing interests most often clash in the contexts of general management, fire policy, and wildlife management.

GENERAL MANAGEMENT

To understand fully the ramifications that management policy has upon the GYA, one must realize that while the jurisdictional boundaries may be clear to a cartographer, natural ecosystems trace their own paths regardless of political determinations. Migratory elk and bison follow their food sources even beyond Park boundaries, where they are unprotected. Moreover, land uses outside the Park affect areas inside the Park. For example, proposed mineral exploration leases for land adjacent to the Park may have a detrimental effect on nearby grizzly bear populations. Unfortunately, the government agencies have failed to create a policy reflecting the delicate balance of relationships within the GYA.

Despite the numerous conflicts that continue to simmer within the GYA, the central issue often boils down to whether the dictates of man or nature should prevail. The Greater Yellowstone Coordinating Committee (GYCC), with members from the two Services, was created to set a cohesive policy and priorities for the future management of the GYA. The GYCC's "Vision for the Future: A Framework for Coordination in the Greater Yellowstone Area"⁵ states that the goal of the GYCC is to preserve the environment

3. See Karen J. Budd, *Ecosystem Management: Will National Forests Be "Managed" into National Parks?*, in THE GREATER YELLOWSTONE ECOSYSTEM, *supra* note 1, at 65.

4. *Id.* at 68.

5. Keiter, *supra* note 1, at 12.

even when this might impair local community needs and commodity/multiple use management.

Critics point out, however, that Congress never provided the legal authority to set up the GYCC.⁶ Furthermore, the two Services were purposely created for different reasons. Declaring a controlling priority effectively blurs the lines that define the two Services. Although these criticisms seem valid, the recognition by the Services that an action in one region inevitably affects another is welcome. Perhaps Congress will subsequently come to the same realization and provide firmer legislative support. Accordingly, the GYCC's actions to coordinate the political system with the environmental reality can readily be regarded as a positive step for the GYA.

Underlying the policy decisions are the effects that such decisions will have on the surrounding communities. A "nature first" approach will surely hamper local communities dependent on timber activities in the Yellowstone forests. From an economic perspective, timber activities within the GYA consistently lose money. Additionally, they detract from the landscape and encourage greater intrusion along logging roads.

Recreational activities within the GYA forests, on the other hand, produce nearly all of the forest user fees within the GYA. Human use naturally exacts a burden upon the land in the form of car exhaust, garbage and general intrusion upon the land and disturbance of wildlife. However, recreational use imposes much less stress on the entire ecosystem than the timber industry. In essence, recreation provides more, if not all, of the income for the GYA forests, and does so at a smaller price.

Yet, figures show that current spending within the Forest Service budget directs only eighteen cents on the dollar to recreation, as opposed to sixty cents on the dollar to logging activities.⁷ This paradoxical approach reflects politics more than simple economic theory. Where the logging industry provides high paying jobs for local communities, recreation offers relatively little in terms of employment. For instance, tourists tend to buy their camping supplies before coming to Yellowstone instead of purchasing them within the GYA. The Forest Service spending figures, when viewed with an eye toward local employment, illustrate the effective political alliance between regional and local logging interests.

6. Budd, *supra* note 3, at 65.

7. Randal O'Toole, *Recreation Fees and the Yellowstone Forests*, in *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 41.

What is the solution then? Proposals suggest each forest become self reliant on the fees it raises.⁸ In theory, managers will phase out unprofitable activities (logging) and promote profitable activities (recreation). Additionally, conservation groups should be allowed to bid against potential development interests for easements which would presumably forbid development for a period of years. Although these proposals appear attractive in the abstract, they do not address the underlying political tensions that will arise when jobs are lost and communities deteriorate. As seen above, when the issue is employment, local employment concerns often speak louder than the environment.

Consequently, displaced workers will continue to chip away at a purely "nature first" regime. Yet, at the same time, divergent management policies between the Services cannot continue if the preservation of Yellowstone's dynamic ecosystems is the ultimate goal. Given the differing views among the many state, federal, and regional interests involved, Washington may need to provide direction. However, the prospect for any immediate action appears slight given the current status of the economy and the emphasis on employment. When the choice is cutting timber or cutting jobs, the latter are likely to remain standing.

FIRE POLICY

In the summer of 1988, thirty-six percent of Yellowstone National Park (ten percent of the GYA) burned in Yellowstone's largest wildfire of this century.⁹ A combination of conditions—including six dry cold fronts, winds of up to 100 kilometers per hour and a drought that persisted through much of the 1980s—created optimum wildfire conditions. Fires traveled as much as sixteen kilometers in a single afternoon.¹⁰ Natural and man-made fire breaks rarely stopped the fire sparks that blew from spot to spot. Despite one of the largest fire-fighting undertakings in history (at a cost of \$120 million),¹¹ commentators concede man's efforts were largely ineffective. Finally, on September 11, a quarter inch of rain extinguished the fire that no one else could.

When the fires finally died down, the debates regarding the

8. *Id.*

9. Dennis H. Knight, *The Yellowstone Fire Controversy*, in *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 88.

10. John D. Varley & Paul Schullery, *Reality and Opportunity in the Yellowstone Fires of 1988*, in *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 112.

11. *Id.* at 113.

proper role of fire in the Park remained smoldering. Interestingly, most commentators agree that fire has been, and should continue to be, a significant element in the ever changing Yellowstone ecosystem.¹² Most experts agree that a forest management policy must include fires.¹³ Fire contributes to the vitality and diversity of plant life in the forest. For example, when forest managers allow natural fires to burn, a mosaic of diverse undergrowth evolves and provides greater nutrition for the animals that graze upon them. Runoff into streams temporarily provides greater nutrients in the water and invigorates the aquatic life. Furthermore, fires allow the reduction of dangerous fuel levels that accumulate from fallen trees, branches, pine needles, and undergrowth.

Prior to 1972, the Park Service fire policy consisted primarily of suppression. Since that time, the Park Service has recognized natural fire started by lightning as a positive and natural element within a healthy ecosystem. As anyone who ever tried to start a fire with recently cut logs knows, "green" timber does not burn easily and these fires generally burn themselves out after just a few acres. Fires often occur at the ground level and thereby contribute to the beneficial mosaic pattern of vegetation. The current policy allows lightning-caused fires to burn in designated areas unless it poses a risk of wildfire or potential destruction of human life, property or unique features of the area. All nonprescribed human fires are to be suppressed in a safe and cost-effective manner. Prescribed burnings are to take place when and where necessary to reduce dangerous fuel levels or restore certain types of vegetation. Full suppression remains the policy for fires near human population centers or forest areas where important timber production is important. However, the fire policy away from visitor centers and timber areas is to allow natural fires to run their course.

Opinions differ over the proper role of man-made or prescribed burnings. Simply put, a prescribed burning is a man-made fire employed to achieve specific goals. Proposals emphasize that prescribed burnings effectively reduce excessive fuel accumulations that present dangers of wildfires. Managers evaluating a proposed prescribed burn consider the time of year, weather patterns, fuel/moisture content, and overall accumulation. By comparing daily weather conditions recorded by Old Faithful monitors, scientists have determined that two out of every three years present accept-

12. *Id.* at 107.

13. *Id.*

able conditions and three out of every twenty years present preferred conditions for burns during the month of September.¹⁴ Fall presents the best time of year because the upcoming rains reduce the danger of wildfires.

Prescribed fires can play an important role, especially near population centers and other areas of special interest. Critics point out that prescribed fires are an intrusion upon the natural ecosystem of Yellowstone. The argument has some merit if one takes a strict view of permissible human influences within Yellowstone. However, when one balances the benefits of reducing fire risks around population centers against the interests of the Park as a whole, the intrusion from prescribed fires seems minimal. Moreover, the Services cannot responsibly ignore dangers to local towns and other critical areas. The reality is that prescribed fires effectively reduce wildfire risks near important areas, and a responsible fire policy will allow for their use.

If scientific data could accurately predict when and where wildfires would occur, much of the prescribed fire controversy might soon disappear. Unfortunately, since conditions change so rapidly, accurate predictions continue to be elusive.¹⁵ Wildfire threat depends as much on wind and weather as fuel levels. Additionally, the evolution of forest conditions that present unacceptable risks may take centuries, but data is only a few decades old. In 1988 no data or technology existed to predict an unprecedented event. As of 1989, 103 research projects were studying the 1988 fire. Given the relative youth of this project, conclusions with policy implications will not be published for years. As these studies reveal more data in the coming years, a revised policy may be in order. Until that time, the authors conclude a policy change would be premature.

WILDLIFE MANAGEMENT

The complex and overlapping jurisdictions in the GYA are often most apparent in the prevailing system of wildlife management. In recent years there has been considerable public outcry against the hunting of bison that stray outside the boundaries of Yellowstone National Park. During severe winters feed is dropped by helicopter to starving elk herds, while in other areas they are hunted. These

14. James K. Brown, *Should Management Ignitions Be Used in Yellowstone National Park?*, in *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 144.

15. Varley & Schullery, *supra* note 10, at 112.

widely differing methods result in large part from ranchers' live-stock concerns.

Bison present a unique problem because they migrate and are likely to stray off Park lands especially during harsh winters with scarce food supplies. Bison and elk endanger domestic livestock because they carry brucellosis which causes spontaneous abortions in infected animals. If these herds mixed with livestock on forest lands, the ranchers would no longer be able to ship their livestock interstate. Additionally, the entire state in which the brucellosis is found may lose its brucellosis-free status, thus affecting all the ranchers in the state. In order to preserve the brucellosis-free status, permit-controlled public hunts have been allowed when the bison stray off Park lands to keep the bison and livestock from mixing.¹⁶ Despite years of research and testing, the brucellosis problem has not been solved. A "biobullet" vaccine is used by the Wyoming Game and Fish Department with limited success on elk, but the bison situation remains unchanged.¹⁷ The current policy of complete separation of free-ranging bison and livestock appears to be the only realistic option. Other proposals include delaying cattle movements to areas where bison and elk live during their calving season (when transmission takes place), as well as additional experimentation on vaccines. But until brucellosis is eradicated, bison hunting will likely continue.

Just as fires were once suppressed in Yellowstone, so too were natural predators like bears and wolves. As a result, animal populations that were formerly held in check by predators began to expand to the limits of the food supply. Thus, mass starvations were bound to occur because the feeding ranges were unable to accommodate the greater population size. Fortunately, biologists have realized that predators play an essential part in any healthy ecosystem.

The grizzly bear, under the protection of the Endangered Species Act, is now slowly making a comeback in Yellowstone.¹⁸ However, the grizzly controversy remains unsettled. Approximately forty-four percent of the GYA is open for livestock grazing, and because the grizzly is an omnivore, it competes with other grazing species

16. E. Tom Thorne, Mary Meagher, & Robert Hillman, *Brucellosis in Free-Ranging Bison: Three Perspectives*, in THE GREATER YELLOWSTONE ECOSYSTEM, *supra* note 1, at 284.

17. Robert B. Keiter & Mark S. Boyce, *Greater Yellowstone's Future: Ecosystem Management in a Wilderness Environment*, in THE GREATER YELLOWSTONE ECOSYSTEM, *supra* note 1, at 389 (authors do not define the term "biobullet").

18. *Id.* at 393-94.

for food.¹⁹ Biologists estimate that one out of every five grizzly deaths results from domestic sheep grazing, which severely reduces the grizzly's food supply. This is especially troublesome when one considers that the grizzly is under federal protection.

Perhaps reintroduction of the wolf to Yellowstone presents the most volatile current issue. Trapping, hunting, and poisoning had virtually eliminated the wolf from the Yellowstone landscape by 1926. At that time, the prevailing view categorized animals as either good or bad animals, and the wolf clearly fell within the latter category. Wolves were early victims of superstition and misinformation; however, biologists now see wolves as an important element of a healthy ecosystem.

Ranchers presently oppose the reintroduction of the wolf because they fear losing some stock to the wolf. Certainly the ranchers will lose some livestock, but actual losses should be small for several reasons.²⁰ First, under a proper program for reintroduction, the wolf pack is not likely to stray outside the Park boundaries. This results primarily from the abundance of ungulates (hoofed animals) that are the major prey for wolves that remain within the Park. With a readily available food supply, large migrations are unlikely. Second, the Defenders of Wildlife have established a fund to compensate ranchers for livestock losses from wolves. A third and less savory limit upon wolf migration outside the park is the provision for a "management program." This program would allow wolves outside the Park to be shot despite their federal status as an endangered species.

To the extent that hunters fear a depletion of game animals, their fears are misplaced. Studies reveal that with the abundance of wildlife within the Park, the wolf's demand upon the herds will be minimal.²¹ To the extent that the wolf reduces the number of big game, the effect will be negligible.

With the scientific data lining up on the side of wolf reintroduction, the next step is largely political. An encouraging sign was the establishment by Congress in 1991 of a Wolf Management Committee to develop a wolf reintroduction plan for Yellowstone National Park.²² This action, along with public opinion that generally sup-

19. *Id.*

20. L. David Mech, *Returning the Wolf to Yellowstone*, in *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 313.

21. See generally Francis Singer, *The Ungulate Prey Base for Wolves in Yellowstone National Park*, in *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 323.

22. *THE GREATER YELLOWSTONE ECOSYSTEM*, *supra* note 1, at 308.

ports reintroduction, strongly suggests that the wolf may soon reenter a scene it should never have been forced to leave.

For the neophyte and scholar alike, this collection of articles is an outstanding look into the issues that surround our country's first national park. The issues and conflicts discussed hold insight to not only Yellowstone's future, but the future of our other national parks as well. Ultimately, a cohesive policy that integrates the roles of man and nature remains to be forged. This book provides an excellent base from which to begin.

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