

PERC REPORTS

FOR FREE MARKET ENVIRONMENTALISM

Yellowstone fires of '88

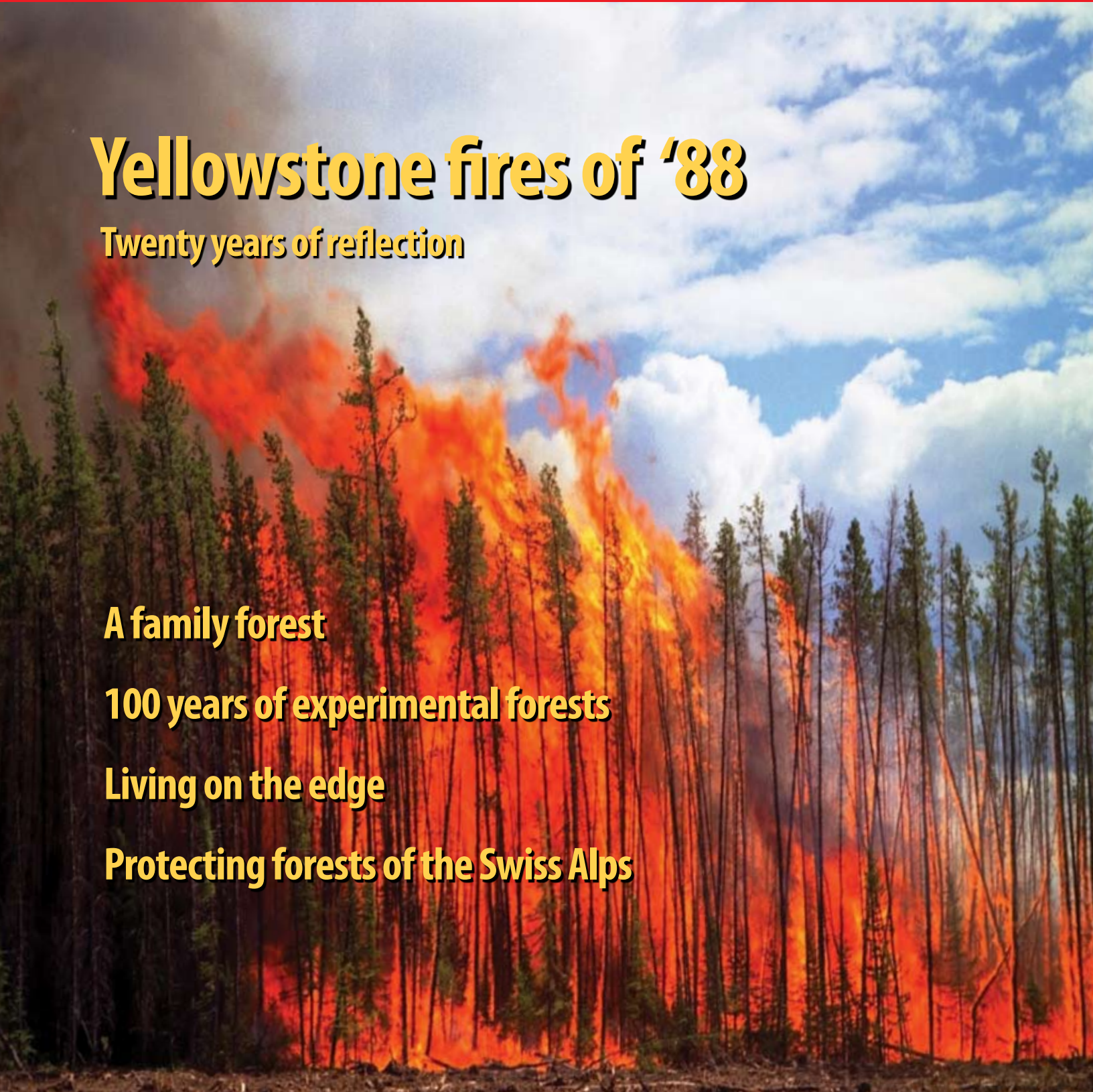
Twenty years of reflection

A family forest

100 years of experimental forests

Living on the edge

Protecting forests of the Swiss Alps





PERC REPORTS

For Free Market Environmentalism Summer 2008 Volume 26, Issue 2

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Stepping out of the car into ash that was a foot deep was an experience I won't forget. I couldn't fathom that fire, with flames massive enough to jump rivers, consumed nearly half of Yellowstone Park. How could thousands of firefighters and millions of dollars have such little impact?

The following summer, I dreaded my annual trip to the park. But when the time came, I saw signs of hope and answers to my questions. The fuchsia fireweed and lime-green lodgepole pine saplings glowed amongst the charcoal remains of the old forest. It turns out that fire is an essential ingredient to forest health and growth—Smokey Bear had duped me good.

*I can't help but ask whether a view preached by an amiable spokesperson for the Forest Service actually contributed to today's "forests of torches." Seasoned journalist **ROCKY BARKER** and PERC forestry expert **ALISON BERRY** suggest the answer is yes. Barker, who narrowly escaped the flames of '88, reflects on the 20th anniversary of the Yellowstone fires. Berry explains the strained relationship between forests and the Forest Service and offers direction for private individuals who want to take fire into their own hands.*

*Though the state of our overgrown forests is complex, **DOUG CRANDALL**, a director with the U.S. Forest Service, points out that federal experimental forests have been working for a hundred years to create healthier stands worldwide.*

*Speaking of healthy forests, veteran forester **STEVEN BICK** tells an enchanting tale of a family forest now run by the seventh generation. Turns out ownership and stewardship really do go hand in hand.*

*Looking beyond the U.S. tree canopy, resource economist **MARTIN HOSTETTLER** paints a dramatic picture of the role forests play in protecting Swiss villages from snow and rock avalanches.*

*New to this issue is PERC's **CAROL FERRIE**. Her "Impressions" offer an attentive but non-expert take on free market environmentalism in the real world. Also, there is now more to PERC Reports on the Web—stories by forestry specialists **ROGER SEDJO** and **ROBERT NELSON**.*

*Last but not least, our regulars continue to offer fresh insights to green issues. **TERRY ANDERSON** explores what it really takes to be green, while **DANIEL BENJAMIN** looks south of the border to find that driving restrictions don't really improve air quality. **LINDA PLATTS** takes the reader to the Delaware Bay, where old subway cars create condos for marine life; to Peoria, where prairie grass makes for a successful business; and to a solution for saying good riddance to your junk.*

We hope this special issue helps you see through some of the smoke this fire season and spot the long-term benefits of improved forest management.

Laura E. Huggins

Laura E. Huggins | EDITOR

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THE DEVIL'S IN THE DETAILS

Thanks for your continuing excellent articles. The article by G. Tracy Mehan, III, [Let's drink to private water] was of special interest as I have spent my 35 plus year career working for water and wastewater design firms. My support for private enterprise has seldom had any hearing in my profession, so I welcome any discussion of privatization for improved management of our water and wastewater infrastructure. One issue Mehan didn't address (for lack of space, I'm sure) is the nature of public-private agreements in new privatization ventures. The devil is in the details, and a poorly designed agreement can create problems that are as serious as continuing an inefficient and bureaucratic public operation.

For instance, in one of my projects of several years ago, the private operator was paid a flat lump sum per month by the public owner for all operation and maintenance expenses. Capital improvements were to be paid by the owner, even though designed, bid, and constructed under the management of the private operator. This created a strong incentive for the private operator to defer certain maintenance costs and to include needed replacements and improvements in equipment in upcoming capital projects. As the design firm, I and my colleagues found it frustrating to include routine equipment improvements in our bidding documents, when it was obvious to us that they were needed immediately to assure continued proper operation of the facility.

Lawyers and public administration experts probably have a name for this flaw in public/private contractual agreements, and I hope the situation I encountered was an exception rather than the rule in such partnerships.

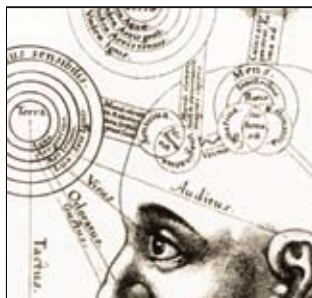
*Kurt Leininger
Malvern, PA*

BOTTOM UP MANAGEMENT FOR FORESTS

Jack Ward Thomas was with the Forest Service for 30 years and was much of the problem. He did mention in his article [Turning the tide for national forests] the success with state-owned forest lands. Managing our forests like the states do would be much more productive than setting them aside for recreation and letting them burn.

The United States has to start producing more new wealth or we will be a third-world country in no time. There are more individuals working for the government nationwide than there are in manufacturing, that is one scary statistic.

*Steve Hicks
White Sulphur Springs, MT*



Tell me what you think!

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GRIZZLY BEARS AND IDEALISM DON'T MIX

I enjoyed some of the latest *PERC Reports* "policy" issue. Chief Jack Ward Thomas' heretical discussion of possible de-federalization of national forest lands was timely and necessary. An agency that literally burns half its annual budget in four weeks is clearly dysfunctional and in need of major change, even elimination.

I must, however, take exception to Hank Fischer's article about reintroduction of bears into the Bitterroot-Selways [The bear necessities]. Experimental status is all theoretically well and good, but in practice, such as has happened with "nonessential" work with blackfooted ferrets, the presence of the species

alone sets off the eco-litigation machine. In the case of wolves, the political reality is the animals have had full-throttle Endangered Species Act (ESA) protections except in the most limited cases.

Furthermore, in the case of the citizen advisory group (CAG), which I supported at first until later “educated,” the big hook was that final power remained vested in the Secretary of the Interior, then the ideological Bruce Babbitt. Who knows who would have been Gore’s choice or what might have happened if the griz were so “successful” that the CAG might have called for hunting in order to moderate the “dinner bell” phenomenon. Under section seven of the ESA, a secretary could simply unilaterally deep-six the CAG and [direct all federal agencies to use their existing authorities to conserve threatened and endangered species].

Until the ESA is truly reformed, there is little possibility for cooperation, and no place for idealism. Fisher of all people should understand that.

*Dave Skinner
Hydra Project
Whitefish, MT*

COMMON SENSE TO THE RESCUE

I absolutely love the position that *PERC Reports* has taken! It is the common sense approach to developing a better environment and better conditions of freedom and responsibility. I have been increasingly aware of PERC and have started to read more of the publications that have been produced...I would like to figure out a way to learn more about this exciting approach of applying market principles to environmental problems.

*Roy Anthony Prond
Columbus, OH*

RED, WHITE, AND GREEN

As a Congressional candidate in North Carolina’s 4th District with three young children, sustainability and the environment are tremendous concerns. I appreciate PERC’s efforts to highlight environmental solutions that respect private property and emphasize the importance of concerned individuals making rational choices. Too often, we rely on heavy-handed central governments for environmental “protection”, when those same governments are the source of environmental destruction.

*William (B.J.) Lawson
Candidate for Congress
North Carolina’s 4th District*



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ARE YOU REALLY GREEN?

It is impossible to read a newspaper or magazine, turn on the radio or television, or engage in a cocktail party conversation without the words “green” or “eco” popping up. There are green television stations, green termite killers, green cars, eco-moms, eco-fashion, eco-tours, and the list goes on. Everyone insists on being *Greener Than Thou* (the title of a new book by Laura Huggins and me available from the Hoover Institution Press).

The drive to be greener than others begs two questions. Why is everyone so green here and now, and what really constitutes being green?

Even on the first Earth Day in 1970, there were relatively few people who would call themselves environmentalists, despite the fact that rivers were burning, children could not play outside due to smog, and species such as the bald eagle were threatened with extinction. Today, on the other hand, when the air and water are cleaner, more land is protected, and wildlife habitat is greatly improved, we are all environmentalists.

The main reason for the change is shown by the “Environmental Kuznets Curve,” named for Harvard Nobel laureate Simon Kuznets. This demonstrates that environmental quality may fall as incomes rise from very low levels, but that it eventually begins to improve as we get richer (approximately \$5,000 per capita for most measures of environmental quality such as clean air and water). The reason is simple; once we have more food, better shelter, improved health care, and so on, we can afford a higher level of environmental quality.

Since the first Earth Day, U.S. per capita incomes have more than doubled. At \$18,000 per capita four decades ago, we couldn’t afford to clean up burning rivers; today at \$38,000 per capita, we spend billions of dollars to remove minuscule amounts of pollutants, such as arsenic, though they present no real threat to humans or wildlife.

As we have gotten richer, we also seem to have moved from addressing current environmental problems toward preventing hypothetical ones. On the endangered species front, today’s green focus is on hypothetical extinctions predicted from biodiversity models rather than on observations of actual threatened animals or plants. People who hypothesize mass extinctions cannot name even a few species that have gone extinct in the last decade. And for the mother of all environmental issues—global warming—we are willing to spend trillions of dollars reducing carbon emissions despite sound reasons to doubt the extent to which warming is human caused and the fact that our actions will have little impact on global temperatures over the next century.

This turns us to the question: How do we know if we really are green? Consider the electric car



with the sign on its side reading “zero pollution.” True, the electric car has no tailpipe, but what about the coal-fired generating plant that produced the electricity that charged the car’s battery? Does recycling paper really save trees when the pulp for new paper comes mostly from trees that were planted to meet the pulp demand and will not be planted if that demand falls? In greener-than-thou circles, it borders on immoral to not recycle, but there is ample evidence suggesting that some recycling uses more natural resources than it saves (see Dan Benjamin’s *PERC Policy Series, Eight Great Myths of Recycling* at www.perc.org/perc.php?id=179).

When *Sesame Street* character Kermit the Frog croaked, “it’s not easy being green,” it was prophetic. Claiming you are green because you drive a Prius or because you recycle faithfully may win you points at the greener-than-thou cocktail parties, but do they really help the environment and humanity? As Bjørn Lomborg, author of *The Skeptical Environmentalist*, points out (using ample data), many environmental fears are unfounded and therefore consume our time and energy without much more than feel-good returns. More recently in his book, *Cool It*, Lomborg admonishes us to consider what we could accomplish for humanity if we diverted resources being used to combat global warming toward fighting malnutrition, malaria, or AIDS.

One way you can be sure you are green is by investing in the environment as an asset. Nonprofit groups using private resources to conserve land and water directly produce open space and wildlife habitat. For-profit firms that make unsubsidized profits from new forms of energy or from managing land to enhance Mother Nature’s bounty are serving the demands of people first and improving the environment secondarily. T. J. Rogers, CEO of SunPower Corp., which manufactures solar-power systems, puts it well: “I want solar if it makes money and I don’t want solar if it doesn’t make money” (see www.hoover.org/multimedia/uk/17809079.html).

There is much talk about businesses having double bottom lines, meaning they want to earn profits and improve environment quality. Only by focusing on the first is there any possibility of ensuring the sustainability of the second.

In his “On Target” column, PERC’s executive director TERRY L. ANDERSON confronts issues surrounding free market environmentalism. Anderson can be reached at perc@perc.org.

 For information on *Greener Than Thou* visit hooverpress.org

LIVING ON THE EDGE

BY ALISON BERRY



More and more homeowners on the forest's edge are realizing that they cannot rely on the Forest Service for protection from wildfires. One striking example comes from last summer's fires in the resort town of Sun Valley, Idaho—a hotspot for high-dollar second homes. Among the seasonal residents are Arnold Schwarzenegger and Clint Eastwood.

Last summer, as flames from the Castle Rock fire threatened multi-million dollar mansions in Sun Valley and nearby Ketchum, insurer American International Group, Inc. (AIG) took notice. Members of AIG's elite Private Client Group pay an average yearly premium of \$10,000, and in return they are protected with special emergency services. Tom Futral, AIG's fire protection contractor, rolled into town as authorities were issuing evacuation orders and Forest Service firefighters were working round the clock.

Armed with a spray gun and a truckload of fire retardant, Futral coated AIG's premium customers' homes and the surrounding landscaping. One neighbor, not an AIG client, asked if he might be able to hire Futral's services. But Futral's docket was full—if you were not already on the list, you were out of luck.

The results were striking. When flames did approach the treated homes, a clear line was visible on shrubs—half black, half green—where the fire had been halted by the retardant. This service is a no-brainer for AIG; the potential payout if just one of these homes was lost to fire dwarfs the cost of Futral's services.

Although this last-ditch protection was available only to the very wealthy, anyone can take low-cost preventative measures that significantly reduce the risk of home ignition in the event of a wildfire. This prevention is often much more effective than Forest Service fire suppression efforts.

The key is to begin long before the sparks fly. For example, de-

The key is to begin long before the sparks fly. For example, developers in areas bordering forested lands can use fire-resistant landscaping and building materials—particularly for roofing.



“We’ve watched what you’ve done and now we can protect your home”— firefighter’s comment to homeowners who reduced the risk of their house burning by thinning forest on their property (above), which borders public lands.

velopers in areas bordering forested lands can use fire-resistant landscaping and building materials—particularly for roofing. Ongoing maintenance by homeowners is also important; trimming branches back from structures and keeping lawns and gutters free from debris like pine needles or leaves. A complete and detailed list of these simple, inexpensive preventative measures is available at www.firewise.com.

Research shows that fire-resistant landscaping within a 120-foot radius, combined with non-flammable roofing material, can significantly increase the ability of a structure to withstand a wildfire. Fuels reduction treatments outside of the 120-foot radius were found to be ineffective and inefficient for protecting structures from wildfire. So, the burden for home protection—from a preventative standpoint—largely falls on the private homeowner.

FIRE AND THE FEDS

Federal agencies bear much of the responsibility for wildfire control. Some claim that the Forest Service is to blame for creating hazardous fire conditions—and therefore is responsible for protecting its neighbors from the consequences of its mistakes. Indeed, in some national forests, decades of fire suppression by the Forest Service has resulted in hazardous accumulations of flammable fuels.

Historically, fires sparked by lightning or by Native Americans burned through some forests every 15 to 35 years, clearing out brush and favoring the growth of older, thick-barked, fire-resistant trees. One Forest Service study estimates that, due to past federal fire suppression policy, 30 percent of national forests have been “significantly” altered from historical conditions, and another 39 percent have been “moderately” altered.

That leaves 31 percent of national forests that have not been altered from their historical conditions, for several reasons. Some forests burned during the last century, despite Forest Service suppression efforts. Other areas have been treated by the Forest Service in recent years for hazardous fuels reduction, either through mechanical removal of fuel or prescribed burning. And some forests are not historically prone to frequent fire and so have not been disturbed by decades of Forest Service fire suppression.

Sixty-nine percent of the national forests—116 million acres—have been altered to some

extent by fire suppression. The Forest Service has proposed fuels reduction treatments in these areas to restore the ecological role of fire and to protect their neighbors from the risks of catastrophic wildfire. But fuels reduction on most Forest Service land will not be effective in protecting neighboring structures from wildfire—since most Forest Service land is more than 120 feet from structures. Except in the few cases where national forest boundaries fall within that 120-foot radius, the most valuable preventative efforts will be on private land and are the responsibility of the homeowner.

PRIVATE PROTECTION

Examples abound where fire tears through a wildland-urban interface neighborhood, and some houses are decimated while others remain unscathed. Last fall in southern California, the Witch Fire swept through five San Diego subdivisions that were built, landscaped, and maintained to “firewise” standards, without a single home igniting. Nearby, 1,125 homes burned to the ground.

As more homes (particularly more expensive ones) encroach on forested lands, the insurance industry is taking more notice. AIG’s premium wildfire protection services is one example. State Farm Insurance Company takes a different approach, offering lower premiums to homeowners in six western states, who take preventative steps—clearing debris, moving woodpiles away from structures, trimming back branches—to protect their homes from wildfire.

Local jurisdictions are also adopting regulations that require homeowners to reduce the risk of home ignition. Regulations exist at the state, county, or city level in California, Oregon, Colorado, Florida, Idaho, Montana, New Mexico, Utah, and Washington. Some local fire departments and zoning boards have enacted fire standards for new developments in high-risk areas. But these regulatory and insurance mechanisms are still relatively small-scale, compared to the scope of the wildland-urban interface fire threat.

VIGILANTES FIGHT BACK

The concept of homeowner responsibility is gaining recognition, and with this trend, some rural residents are exploring additional possibilities. Although most of the focus thus far has been the preventive measures that homeowners can take, there may also be a way for homeowners to participate in fire suppression.

A model exists in Australia, where a policy of “evacuate early, or stay and defend” encourages those who are able to remain at home to protect their own property from fires. This policy recognizes three key points: carefully built and maintained homes can protect residents from the

Armed with a spray gun and a truckload of fire retardant, a fire protection contractor coated AIG’s premium customers’ homes and the surrounding landscaping.



radiant heat of wildfire, residents can protect structures by extinguishing small spot fires ignited by stray embers long after the fires (and firefighters) have passed through, and hasty last-minute evacuations create the most dangerous and deadly wildfire situations. Children, the elderly, and the disabled are encouraged to evacuate long before the flaming front approaches. Those who remain behind keep a vigilant watch for embers, which can travel miles from the flaming front and enter homes through vents or eaves, smoldering for hours.

This “shelter-in-place” concept contrasts sharply with the U.S. approach, which favors complete evacuation of large areas under threat from wildfire. Although the intent of this policy is to keep people out of harm’s way, the results can be devastating. Some residents linger too long and are not aware that they are safer at home than attempting to evacuate as the flames encroach. Seventy-five percent of fatalities in California’s 2003 Cedar and Paradise fires occurred during evacuations. Complete evacuation can also result in the loss of more structures. Even the most elite firefighters cannot track every ember or keep an eye on every building. With watchful residents on site, more homes are likely to survive blazes.

Of course, no approach to wildfire is without risk. With shelter-in-place, there is the risk that some people will still attempt dangerous last-minute evacuations, or that residents will try to stay and defend homes that are not constructed or maintained to firewise standards. U.S. agencies prefer to avoid these risks, and instead favor evacuation—keeping people away from the flames, even if some houses may be lost to stray embers.

PRIMED FOR CHANGE

Although the United States might not be ready for shelter-in-place during wildfires, the country is certainly

primed for a change in its approach to wildfire. The Forest Service has long recognized the importance of fire to North American ecosystems, but most fires on national forests are still suppressed—in 2005, more than 99 percent—largely because of the threats to private property in the wildland-urban interface.

The risk escalates as communities continue to push their boundaries into forested areas. Between 1970 and 2000, the developed portion of the wildland-urban interface grew in size by 52 percent, and this trend is expected to continue, according to a 2007 study from Colorado State University.

With more development comes a higher bill for fire suppression. One USDA audit reports that between 50 and 95 percent of Forest Service fire suppression budgets, which have averaged more than \$1 billion per year since 2000, is spent protecting private homes in the wildland-urban interface.

As more developments encroach on forested lands, federal agencies cannot continue to take responsibility for their neighbors, passing the bill on to the taxpayers at large. It would behoove residents of the wildland-urban interface to recognize the threats that exist in their locations and to take preventative steps to protect themselves in the event of wildfire.



ALISON BERRY is a research fellow at PERC, specializing in forestry issues. Before joining PERC, she worked for the U.S. Forest Service as a supervisory botanist and forestry technician. She can be reached at aberry@perc.org.

 **For fire prevention measures visit firewise.com**



A FAMILY FOREST

BY STEVEN BICK



Family forests—both large and small—are common in the Northeast. Most are owned for recreation and relaxation, with other uses incidental to these purposes. When Benjamin Brandreth purchased 24,038 acres of Adirondack timberland in 1851, he was searching for a pristine lake to start a brewing business.

The brewery never came to be, but many generations later his family still owns and enjoys the land. Perpetuating a family forest is difficult. The Brandreths can look back on a string of ancestors who were ahead of their time and credit them with extending the family's stewardship to the present day.

Brandreth's property is tucked away in remote Hamilton County, New York—to this day the least densely populated county in the eastern United States. The newly named 890-acre Brandreth Lake and nearly all of the ten-mile Shingle Shanty Stream are the jewels of this land. Much of the area is mountainous, with northern hardwood stands interspersed with stately red spruce. The Shingle Shanty watershed is an area of wetlands, gravelly eskers covered by stands of spruce and fir, with occasional majestic white pines piercing the main canopy of the forest below.

ENLIGHTENED PLANNING

The second half of the 19th century saw many individuals acquiring large tracts of forest land as family retreats in the Adirondack Mountains of New York. Brandreth's purchase predated this—not surprising for a man who was an innovator in more ways than one. An immigrant from England, he made his mark producing “Brandreth's Pills,” a patent medicine that was used primarily as a laxative. He was an early pioneer in advertising, so much so that

P.T. Barnum credited him as inspiring his grand approach to promoting his circus.

Three of Benjamin Brandreth's 13 children took an abiding interest in the property. Eschewing the luxury of Adirondack Great Camps that were cropping up on similar properties, the Brandreths embraced the bucolic simplicity of the outdoors. Paulina Brandreth, Benjamin's granddaughter, exemplified this, spending her days in the rustic splendor of sporting pursuits. A phenomenal hunter, she was also an outdoor adventure writer. As a woman ahead of her time, she used the pseudonym “Paul Brandreth” for her book *Trails of Enchantment* and numerous articles for *Forest and Stream*.

As the family grew, a minor building boom took place to accommodate everyone. Although cluster development was not widely adopted until the 1990s, the Brandreths embraced this method nearly a century earlier, making a conscious effort to concentrate development on one portion of the north shore of Brandreth Lake. The view of the lake from their small village of camps remains unspoiled, as are views of the surrounding landscape for boaters from the lake itself.

There is a long history of logging the property's abundant timber. The heyday of lumbering operations came in 1892 when the Adirondack and St. Lawrence Railroad provided a commercial link to the outside world. The Brandreth Corporation built its own railroad—the 12-mile Mac-a-Mac Railroad—to transport logs to the main line. A sawmill and village, now abandoned, sprung up at Brandreth Station.



Brandreth Lake by Steve Bick

UNCOMMON TENANCY

A family forest is faced with an ownership challenge every generation or two. By the 1950s, the Brandreths were having growing pains. While the number of people using the property had grown, just a few of them were bearing the property tax burden. As a tax-cutting measure, the Brandreth Corporation sold more than 6,000 acres in two tracts to two family members and donated 9,000 acres to Syracuse University, with recreation rights reserved to the family in perpetuity. The family had the foresight to retain the first right of refusal if this land was ever sold.

Having shed some of the tax burden, family leaders looked for a way to ensure fairness and continued ownership. Tenancy-in-common ownership means that two or more people may have a transferable ownership share in a property, independent from the other owners. The Brandreth Park Association was born as a vehicle for providing each family member a voice in the park's governance and ownership. A total of 120 shares was created in the 10,000-acre area surrounding Brandreth Lake. While individuals own their buildings, the association owns the land beneath them. The association provides governance and coordination of activities, but limits the ability of any one individual to make sweeping decisions affecting each of the others. As a condition of ownership, a share may only be transferred to a descendent of a current Brandreth family owner. This means that the only way the entire property could be sold to an outside interest is through a unanimous decision of all of the owners—a highly unlikely possibility.

Syracuse University already had substantial forest holdings in the Adirondacks, and several years after the Brandreth's donation they approached the family with an offer to sell it back. This opportunity gave rise to Brandreth Associates, a partnership in which many Brandreth Park owners have an interest, but only majority partners make decisions. The land was reacquired and some years later Brandreth Associates sold all but 2,240 acres adjoining the park to International Paper Company (IP), reserv-





Logging in Brandreth family forest by Steve Bick

ing recreation rights in perpetuity. Years later, in hindsight, other restrictions on IP's use of the property would have been desirable, but this transaction took place prior to the widespread use of conservation easements. The two other family properties made similar deals with IP. Brandreth Associates retained a 25-year first right of refusal if IP sold the property. This would prove to be one year too few.

CUTTING TIMBER & TAXES

Property taxes are the bane of forest landowners in New York State. Non-resident forest landowners keep the land in open space, do not send children to local schools, require few municipal services, and are rewarded twice each year with hefty tax bills. The Brandreths hoped to avoid the fate of nearby properties, where sustainable practices have been abandoned in the pursuit of quick revenue.

In 1992, the family took an important step in the continued stewardship of their properties by enrolling them under the New York State Forest Tax Law. This law provides an 80 percent exemption in the property tax assessment of eligible forest land, in exchange for a long-term commitment of the land to timber production. An initial ten-year obligation is followed up by rolling annual decade-long commitments, with substantial penalties for withdrawal. Enrolled land must follow a detailed forest management plan, prepared at the landowner's expense and approved by the State Department of Environmental Conservation.

The upshot of this enrollment is that funds that were devoted to property taxes can now be used for stewardship of the land—improving roads and trails, employing caretakers, stocking fish, and planning for the future. The property tax break afforded by the Forest Tax Law allows the family to schedule timber harvests to correspond with desired conditions in the forest and market realities. There

is no pressure to provide a set amount of annual income or to harvest timber during conditions of uncertain markets.

EASING INTO THE FUTURE

Each generation faces its own challenges and opportunities when it comes to perpetuating a family forest. The Brandreths addressed the latest challenge with a creative arrangement of ownership rights. In 2001, a year after Brandreth Associates' first right of refusal expired, International Paper Company sold the Shingle Shanty Tract (subject to Brandreth's recreation rights) to the Nature Conservancy (TNC) as part of a larger transaction. Large-scale land sales in this region often have political undertones, and this parcel was a lesser part of a larger transaction that began then—Governor Pataki's "march to a million" acres of open space protection.

The Nature Conservancy sold a restrictive conservation easement on this parcel to the Sweet Water Trust, ruling out development and timber management. Without timber, recreation, or development rights, fee ownership of this parcel means little more than annual property tax bills. Despite this, TNC was actively attempting to sell the property to other parties. The potential for another outside owner becoming involved in the land was alarming to the Brandreth family. Some believe that the State of New York and others were using this situation as leverage to get public access to the coveted Shingle Shanty Stream.

A group of family members devised a clever plan to protect the Brandreth legacy. Late in 2007, family members created Shingle Shanty Preserve and Research Station, a nonprofit organization whose mission is to "facilitate the study and dissemination of learning about the environment, geology, and wildlife of the Adirondacks." A small family group secured ownership of the land through a multi-faceted deal with TNC that consisted of a conser-



Brandreth Lake outlet by Steve Bick

vation easement restricting development on a 2,240-acre parcel adjoining the Brandreth Park and other considerations totaling \$1.2 million. The property is now known as the Shingle Shanty Preserve, and is dedicated to the nonprofit's mission. The land will be available to outside parties, by permit, for research and educational activities.

NOW AND FOREVER

Today's Brandreth Park Association (BPA) has taken a hard look at the future and is being proactive to ensure the family legacy. The leadership structure includes a president, a vice president for internal affairs (caretaking, roads, forestry, etc.), a vice president for external affairs (government agencies, press, local government), and eight committees contributing to various aspects of management. Any owner can opt to serve on a committee.

According to BPA president Judson Potter, there is a two-part effort to prepare the next generation for their ownership responsibilities and "inculcate them in the culture of the park." Family time spent enjoying the park is enough to begin the enchantment for most children but, as an additional measure, children attend classes on traditional outdoor activities. Younger adults who haven't yet become owners are allowed full use of the property through an associate membership. These associate members enjoy the park at a reasonable cost and are encouraged to participate in the various BPA committees.

Seven generations and 157 years later, Brandreth Park includes family members of all ages and backgrounds, visiting from all over the country—all descendants of Benjamin. Virginia Brandreth, the association's current vice president for external affairs, sums up their hope for the next hundred years:

"That the family can look out on Brandreth Lake and see it very much as it is today; that they have inherited the full 27,500-plus acres that exist in the various family ownerships knowing that Brandreth Lake, our ponds, mountains, and Shingle Shanty Stream look to them the same as they do to us today."

Coming generations will undoubtedly face new challenges in protecting this family forest, but they will be given an intact resource, with many safeguards already in place. The Brandreths have proven that family ownership and stewardship go hand in hand.



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What's economics got to do with it?

I am *not* an economist. This was my mantra when I started working at PERC nearly seven years ago. It seemed the best way to remove myself from discussions around the office—ones that touted the benefits of hunting, logging, and, most disturbing of all, the fences that kept me and my fly rod out of some sizzling trout pools.

I wish that I could say I applied for the job at PERC because I was a staunch “free marketeer” and passionate about its mission: to improve the environment using markets. The truth is, if someone had offered me a million dollars seven years ago to explain what the mission even meant, I couldn't have done it. Of course I wanted to make the environment better. Doesn't everybody? My contributions were to pick up trash along the riverbank when I was (catch-and-release) fishing, recycle newspapers and cans, and turn my nose up when I heard a hunting story.

PERC had just launched a month-long program for conservation leaders to learn “innovative” approaches to solving environmental problems, and I was hired to coordinate and promote the program. I learned all the lingo—market approaches, incentives, property rights, costs and benefits, etc.—so I could field basic questions about the program.

From the outset, I had my doubts as to whether the whole “free market environmentalism” thing really worked.

It wasn't until my second year at PERC that something finally clicked. I had arranged to take the program participants to the MZ Bar Ranch (pictured above) in nearby Belgrade for a presentation and tour of this third-generation cattle ranch and, of much more interest to me, blue ribbon trout fishery. The scenery at the ranch was spectacular and Tom and Mary Kay Milesnick were just what you would expect of Montana ranch owners—hospitable, gracious, and loved their work so much that they rarely felt the need to get away for a vacation.

The ranch used to be a place where locals just had to knock on the Milesnick's door and ask permission to fish the two spring creeks and East Gallatin River, all of which

flow through the ranch. Not much attention was given to how many fishermen waded the streams each day or how many fish they caught. The Milesnicks were more concerned with their cattle operation. That's what was putting bread and butter on the table. Cows were the priority, not trout. So the cows roamed anywhere and anytime they pleased, trampling stream banks to the point of destroying fish habitat.

Fast forward to 1992, when the Milesnicks became more environmentally aware and decided to change grazing practices and do stream restoration work to improve fishing. Word of the improved fishing conditions got out and the demand to fish became much greater. In 1999, the Milesnicks established a fee for fishing on the spring creeks, recouping their initial investment and allowing for continual upgrade of the streams.

Having to pay to fish was not well received by some local fishermen. At the time, it didn't sit well with me either. But after hearing the Milesnicks tell their story, the picture finally became

clear to me—market approaches to environmental problems *do* work.

Some might say that the Milesnicks capitalized on the rising popularity of fly-fishing. I say, so what. If not for the economic incentive derived from the fishing fees (\$75 a day per rod with a limit of six rods per day), the Milesnicks probably wouldn't have cared much about restoring their streams to the amazing fisheries they are today.

So my epiphany about markets and the environment didn't come in an economics classroom. It occurred while riding on a hay wagon at a coveted Montana cattle ranch. My understanding becomes more clear with each similar story that I hear from environmentalists throughout the world whom I have met through my work with PERC's enviropreneur program.

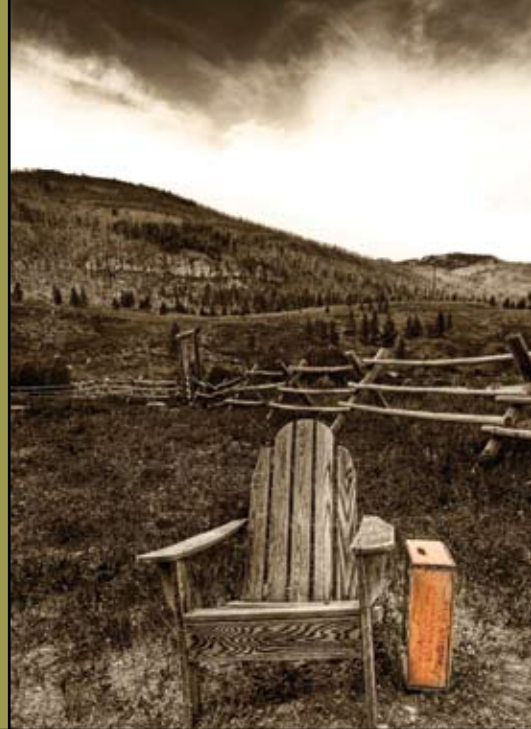
I'm still *not* an economist. But I don't need to be. Anyone who sees and hears what I have in the last few years will clearly understand that many aspects of our environment are better only because of market solutions. Where is that million dollar offer now?



YELLOWSTONE FIRES OF '88

Twenty years of reflection

BY ROCKY BARKER



Courtesy of Trey Ratcliff



The
Yellowstone
fires of '88
took a toll
on the park's
wildlife.

Twenty years ago, fires broke out in Yellowstone National Park that started a public debate about firefighting and public land management that continues today.

I covered those fires as a newspaper reporter and, like all else involved, I couldn't know that the Yellowstone fires were the first in a series of huge fires that by the 21st century had become routine in the American West. Yellowstone's were the signal fires that heralded this new period. The costs of fighting fires keep rising, as does the number of lives and homes lost to fire.

The fires started small in May and June, then blew up into conflagrations that firefighters had not seen the likes of since the summer of 1910. On Black Saturday (Aug. 20, 1988), 165,000 acres burned inside Yellowstone. A friend flying over it in an airplane said the convection clouds rising from the firestorms into the stratosphere made it appear that Yellowstone was under nuclear attack.

I got caught in one of those firestorms on Sept. 7 at Old Faithful, along with more than 1,000 tourists, rangers, concession employees, and firefighters. It was an incredible sight.

At first it looked like a typical fire day with smoke rising to the West. But at 3:30 p.m., just as Old Faithful was completing its famous eruption to the ahs and sighs of visitors, the conflagration came over the hill. Flames rising more than 200 feet put on a show for the concession employees sitting on the roofs of their buses waiting

to evacuate. As the flames rose, the workers were cheering like they were at a ball game. But soon the situation turned scary with firebrands as large as fists blowing by their heads, gale force winds, and a noise like a covey of jets flying overhead.

I was standing just behind the fireline when I felt a hot wind on my back. On the ground I saw leaves blowing toward the fire. Suddenly it turned black as night and the winds whipped into a tempest. I turned and ran through the woods toward the large parking lot behind the historic log-constructed Old Faithful Inn. Once I arrived, I turned and watched the entire forest go up in flames.

A few days later I was sitting beside the road at Mammoth Hot Springs waiting again for the firestorm to arrive. But a slight rain, and even snow in the high country, reduced the humidity just enough to take the fury out of the fires for good, though they didn't go out until snow covered the park in November.

THE AFTERMATH

By the end of the 1988 fire season, up to 2 million tons of particulates, 4.4 million tons of carbon monoxide, 129 tons of nitrogen oxide, and 106 tons of hydrocarbons were released into the air and dropped in the form of air pollution as far away as Boston, Mass., and Amarillo, Texas. Enough commercial timber to build 11,000 homes burned in surrounding national forests. Overall, the fires cost nearly





Fifty fires raged through Yellowstone Park in the summer of 1988, burning 36 percent of its 2.2 million acres.

\$140 million—14 times Yellowstone’s annual budget.
 Of the 25,000 firefighters who passed through the fires, two died—one in a plane crash and the other when a tree fell on him. Across the West, 6 million acres burned, the most since 1960, when agencies began keeping good records.

CHANGING FACE OF FIRE

In the American West, we live in a new world of fire—a world that appeared in 1988.
 The 1988 fire season seemed an aberration. It was among the hottest years on record. The drought across North America was the worst since the 1930s. In the former Dust Bowl states—from Montana to Nebraska and Kansas to Texas—farmers reported dark clouds of dust as their topsoil blew away. By June 1, the Soil Conservation Service estimated 12 million acres were damaged by wind erosion.
 Record temperatures hit cities across the country. American companies sold 4 million air conditioners and could not keep up with demand. Congress held hearings on the greenhouse effect and climate change.
 Twenty years later, conditions like those of 1988 are the norm. In 2006, 9.5 million acres burned, followed by 9.3 million acres in 2007. With six out of the last eight years among the worst fire seasons since 1960, it is “the indefinitely bad



Military firefighters at the northeast entrance

season,” says Tom Boatner, the Bureau of Land Management’s just retired chief of fire operations and a 30-year firefighting veteran.

The Intergovernmental Panel on Climate Change and its 2,500 scientists from around the world have concluded that the wholesale burning of fossil fuels has contributed to the warming, drying, and longer fire seasons we are experiencing today. If it continues, the forests, which capture 20 to 40 percent of the carbon that scientists say contributes to the climate’s change, will burn and turn from net carbon sinks to net carbon sources, according to scientists from the U.S. Forest Service and University of Washington.

‘LET IT BURN’ REVISITED

The Yellowstone fires signaled that nearly a hundred years of wildland firefighting, begun in Yellowstone by the U.S. Army in 1886, had made the forests more flammable and more dangerous.

Foresters had convinced Americans that putting out all fires—removing fire from the ecosystem—was the best policy. For more than a century, these forests filled with fuel, making them harder to protect.

The 1988 fires actually impeded the use of fire to reduce forest fuels. Since then, and still today, National Park Service managers have been more cautious. It wasn’t until 1994, when 14 firefighters died on Storm King Mountain next to Glenwood Springs, Colo., that the idea of allowing fires to burn gained credence once again, this time for firefighter safety.

In the interest of safety, fire bosses began to routinely pull firefighters off of fires. In some high-elevation forests, managers justified “letting it burn” by saying it wasn’t safe to fight the fires.

Eventually, managers advocated thinning out thickets of younger trees that unnaturally carry a fire from the ground to the crowns. This triggered a debate once again between the timber industry and environmentalists. The timber industry advocated active management; using the tools of logging and the expertise of foresters to thin out forests the way it had done successfully on its private forest lands. Environmentalists didn’t trust the industry’s intentions. They preferred burning. Both sides spun the science to support their own position best.

Randal O’Toole, an Oregon-based economist, helped initiate the third wave of support for burning. With free market economics as his Pulaski (the combination axe and hoe used by firefighters to cut a fireline), he cut through foresters’ ideology. He showed that in the 1980s, the Forest Service was clearing more timber and building more roads than the forest ecosystems could sustain because of its perverse incentive systems: Managers were rewarded when they cut more timber or built more roads, even if they lost money, destroyed wildlife habitat, or silted up streams.

After the 2000 fire season prompted Congress to give the agency \$1.6 billion for firefighting, O’Toole saw a new, major shift in the incentive systems. Even though Congress removed first Forest Service Chief Gifford Pinchot’s 1908 blank check provision for fire funding in 1978, the years of big fires in the 1990s had brought it back in practice.

The Forest Service would simply go to Congress each year after the fire season and request additional firefighting funds. Now, firefighting and pre-suppression funds, money for prescribed burning, and thinning are driving the Forest Service’s budget. The spending is necessary, agency officials say, to protect communities near national forests.

But O’Toole has found that across the West, only 7 million acres have a moderate to high risk of wildfires that threaten structures. Of that, 90 percent are on private property and 8 percent are on federal land.

“It seems the Forest Service can’t lose,” O’Toole told me. “If it puts out fires that might actually produce ecological benefits, it is a hero for saving people’s homes and the public’s forests. If fires get away and burn the forests and homes, Congress writes a blank check for suppression and prevention. The only danger for the Forest Service is that the weather might enter a wet period, dampening Congress’ enthusiasm for spending on fire.”

TAKING RESPONSIBILITY

Forest Service fire behavior researcher Jack Cohen goes even further. His research shows that even in the worst firestorm, a house with a fireproof roof and flammable objects, bushes, and trees kept 100 feet from the walls, won’t burn as a fire passes through. Cohen’s and other’s research questions the logic behind spending hundreds of millions of dollars to fight fires in the wildlands to protect homes, especially when foresters agree that fire is usually beneficial to the ecosystem. For years, the firefighting establishment has been able to put out 98 percent of all fires that start; yet since Yellowstone, more and more acres continue to burn.

If people take responsibility for their own homes, billions of the money spent to fight wildland fires would be unnecessary. But how to pay for managing our national forests to address all of our human needs, including sequestering carbon, remains unresolved.



ROCKY BARKER is the author of *Scorched Earth: How the Fires of Yellowstone Changed America*. He also is environmental reporter for the *Idaho Statesman* and was a PERC Media Fellow in 2007. He can be contacted at rbarker@rockybarker.com.

100 YEARS OF EXPERIMENTAL FORESTS and eons of tinkering

BY DOUG CRANDALL



The Forest Service manages more than 80 experimental forests and ranges for the purpose of conducting applied research.

Since humans first set foot on American soil about 15,000 years ago, forest management has been a way of life. These Asian immigrants brought with them a vast knowledge of ways to manipulate forests (including the use of fire) and make them a source of food, shelter, medicine, bedding, tools, weapons, and a host of other essential uses.

Dense, closed forests provided little for these paleoindians in terms of food; the grasses, shrubs, and forbs they needed for themselves and for wild game were more available in open forests, as were trees and shrubs that produced nuts, acorns, and berries. These intelligent and creative people used fire to thin and open dense stands. Evidence shows few, if any, landscapes unaffected by paleoindian fire.

The structure and makeup of American forests first viewed by Europeans were greatly impacted by, and to a great extent the result of, intentional manipulation by Native Americans. Many Europeans learned the value of these techniques. The founder of the Rhode Island colony, Roger Williams, documented this observation of native forest management: "This burning of the wood to them they count a benefit, both for destroying of vermin, and keeping down the weeds and thickets."

European settlement had its own impact on forests, largely in the form of their removal for agriculture, fuelwood, and building materials. The story of the decline of American forests, particularly in the East, as well as their recovery, has been well documented since 1900, following the birth of the modern conservation movement. A key element of that movement was the emphasis on, and growth in, the forest sciences. This is indicated in part through the increase in number of forestry schools. Only two colleges offered forestry curricula in 1900, but by 1915 there were 13. In addition, the advancement of science in forestry became one of the objectives tied to the creation and management of the nation's forest reserves.



EXPERIMENTAL FORESTS

Shortly after President Roosevelt created the USDA Forest Service in 1905 and placed it under the supervision of his friend Gifford Pinchot, the agency's first chief, the department worked to establish experimental forests. In August of 1908, Raphael Zon, the first chief of silvics, planted a ceremonial tree at the initial experiment station at Fort Valley in Arizona, saying, "Here we shall plant the tree of research." One hundred years later, the Forest Service manages more than 80 experimental forests and ranges for the purpose of conducting applied research—living laboratories where long-term science and management studies can be done on all of the nation's major vegetation types. Among them are tropical forests (Luquillo Experimental Forest in Puerto Rico), boreal (Bonanza Creek Experimental Forest in Alaska), semi-arid chaparral (San Dimas Experimental Forest in California), and peat-bog deciduous (Marcell Experimental Forest in Minnesota). The experimental forests range from small units (116-acre Kawishiwi Experimental Forest in Minnesota) to large (55,600-acre Desert Experimental Range in Utah).

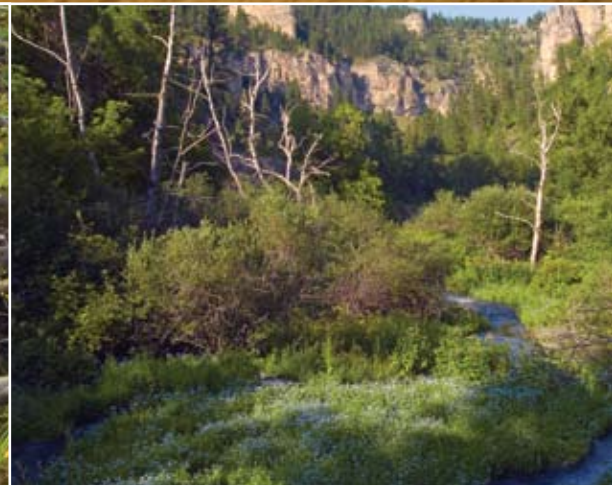
Many important scientific and policy advances have been made at these sites. Some examples are:

- The Wind River Experimental Forest in Washington was crucial in addressing reforestation needs following extensive logging and major fire events in

Douglas fir forests of the Northwest during the first half of the 20th century. As a result, millions of acres were successfully regenerated.

- A primary management tool for achieving the important ecological task of reintroducing native long-leaf pine forests in the South was developed at the Escambia Experimental Forest in Alabama.
- Many rangeland restoration methods widely used today were developed through grazing studies on the Great Basin Experimental Range in Utah.
- The Calhoun Experimental Forest in South Carolina was created from lands that had been severely degraded by extensive cotton and tobacco farming. Considered the "worst of the worst," this site provided a perfect laboratory for focused and highly successful, long-term research on soil improvement.
- The first documentation of acid rain in North America took place at the Hubbard Brooks Experimental Forest in New Hampshire, where some of the first and most complete, long-term watershed and hydrologic studies have been done and continue to be undertaken.

The research done at these locations has typically been long-term and of a collaborative nature engaging univer-



sities, government agencies, tribal governments, private industry, private landowners, conservation groups, and other forest scientists from around the world. These forests continue to contribute to issues of relevance, such as invasive plants, insects and disease, global climate change, watershed function, and recovery after natural disturbances.

CHALLENGES

All of this is good and, in its centennial year, worthy of celebration; but there are some problems—or as we are urged to say in the government vernacular, there are “challenges.”

The short list includes aging infrastructure, unstable funding streams, political meddling, and bureaucratic weight. But probably most troubling is that the ability to do cutting-edge research is diminished on these federal lands because of the same regulatory congestion that restricts management on the rest of the federal landscape. Just to do basic research, the agency is required to spend huge amounts of time and money to produce volumes of procedural documentation required for compliance with the National Environmental Policy Act, the Endangered Species Act, the Administrative Procedures Act, the National Forest Management Act, the American Antiquities Act, the Clean Water Act, and a host of other laws. Ironically, Congress passed each of these laws individually with the intent of protecting the environment, but collectively their

overlapping and sometimes contradictory requirements have become a barrier to the efficient accomplishment of some of the basic research needed to help find solutions to important ecological problems.

An additional consequence of this gridlock is to push some of the most important research onto non-federal lands where work can proceed more economically and effectively. This would be fine except that the best areas for doing this type of research often fall within the 193 million acres of national forest. The diversity of landscapes and the amount of available land for “control” sites are unmatched.

Even more disconcerting is that because of the legal/political stalemate tying up management decisions on federal lands, little of the cutting-edge science being developed by the Forest Service can actually be applied on Forest Service lands. Fortunately, however, this research is helping to advise the management of state, private, and tribal lands, and forests and grasslands in other countries.

KNOWLEDGE

The advent of the scientific method has created an exponential increase in the knowledge base available for making informed decisions in every aspect of our lives; forestry is no exception. And experimental forests have played a key role in this regard during the first century of their existence. The knowledge created at these experimental



The knowledge created at these experimental forests is not a replacement of, it is in addition to and an improvement on, the knowledge that was built over eons of human interaction with forests.

forests is not a replacement of, it is in addition to and an improvement on, the knowledge that was built over eons of human interaction with forests. The cumulative result is that our abilities to manage forests for a host of ecological and economic values have increased dramatically and will continue to improve as long as we continue to fund and promote basic forest research.

The thoughtful utilization of experimental forests needs to remain a key element. To do this, it will be necessary to address the legal/regulatory framework that is limiting the ability of these forests to provide the amount and quality of research for which they are reasonably capable. One suggestion is for Congress to charter a “blue ribbon” panel of forest scientists and managers for the purpose of analyzing these issues and developing recommendations. Recently, some of the higher profile versions of this type of panel have been the Iraq Study Group and the Base Realignment and Closure Commission. A more direct correlation could be made to the Public Land Law Review Commission, passed by Congress and signed into law by President Johnson in 1964.

The charge of the commission was to make a comprehensive review of the public land laws and the rules, regulations, policies, and practices of federal, state and local governments, and to recommend any necessary modifications and prepare a final report. The commission’s 1970 report, “One Third of the Nation’s Land,” paved the way for the eventual enactment of the Federal Land Policy and Management Act and the National Forest Management Act. Given

the recent centennial of the USDA Forest Service in 2005 and this year’s Experimental Forests’ centennial, perhaps the time is right to convene a similar panel to analyze the effectiveness of today’s federal regulatory landscape.

Finally, we need to remember that these experimental forests were established primarily for conducting applied research to better inform the management of our forests and rangelands. Applied research requires changing the environment to understand the environment—this is the essence of experimentation. Excessive regulatory restrictions that impede experimentation are simply bad for the long-term health, productivity, and sustainability of our forests.

In an era where tens of millions of acres of federal lands are at high risk of catastrophic fire due to unnaturally high concentrations of brush, dead trees, and other hazardous fuels, now would be a good time to apply that knowledge to the management of larger segments of our federal landscape.



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ECONOMIST, n. a scoundrel whose faulty vision sees things as they really are, not as they ought to be. —*after Ambrose Bierce*

DRIVING RESTRICTIONS & AIR QUALITY

Automobiles are responsible for most of the air pollution observed in Mexico City. In 1989, the government of that city introduced a program, Hoy No Circula (HNC)—English translation: “today it [your car] does not circulate.” The program bans most drivers from using their vehicles one day per week, based on the last digit of the vehicle’s license plate. It was supposed to sharply reduce automobile-caused pollution. In fact, recent research by Lucas Davis (2008) shows that, despite the program’s high costs, HNC failed to produce any improvement in Mexico City’s air quality.

Levels of major air pollutants in Mexico City have long exceeded maximum exposure limits established by the World Health Organization (WHO). For example, over the period 1986–2005, ozone levels high enough to threaten human health were recorded for 92 percent of all days. It was record levels of airborne pollutants that led the Mexico City government on November 20, 1989, to introduce the HNC program, which, for example, prohibits vehicles with a license plate ending in 1 or 2 from being used on Thursdays. The restrictions are in place between 5 a.m. and 10 p.m. on weekdays and apply to the vast majority of residential and commercial vehicles, exempting only taxis, buses, and emergency vehicles. Enforcement is stringent and, because fines and other costs imposed for violating the ban are substantial, compliance with the program is almost universal.

Davis examines the impact of HNC on the levels of five major pollutants produced by automobiles: carbon monoxide, nitrogen dioxide, ozone, nitrogen oxide, and sulfur dioxide. He finds that HNC failed to reduce airborne concentrations of any of these pollutants. Consistent with this, Davis also finds that HNC failed to reduce the consumption of gasoline in Mexico City and also failed to increase the use of public transportation. Davis does find evidence that some people moved their driving from the restricted weekday hours to late night and weekend hours. But overall, the driving restriction program reduced neither average pollution levels nor daily peak levels of pollution.

What happened? How could a widely obeyed program that seemingly swept 20 percent of the city’s cars off the streets fail utterly in achieving its goal of improving air



quality? The answer is simple: The people of Mexico City bought more cars. A driver with two vehicles can drive every day of the week as long as the last digits of the license plates don't match days. And because the added cars are only needed 20 percent of the time, purchasers generally did not buy new cars; instead they bought used cars, imported from other parts of Mexico or from the much larger United States market. Older cars tend to be high emitters of pollutants (because they lack the newest emissions control equipment and because such equipment becomes less effective with age). Thus, any decrease in emissions stemming from individuals who chose not to add to their auto inventory was fully offset by the added emissions of the cars purchased to avoid the HNC program.

The net effect of driving restrictions in Mexico City has thus been to produce no measurable benefits, but to do so at substantial cost. In fact, Davis estimates that the program has cost the citizens of Mexico City more than \$300 million per year, or about \$130 per car per year. While this may not seem like much, consider that the standard of living in Mexico is roughly one-fourth the level in the United States.

The implications of the Davis findings are important for environmental policy in major cities around the world. For example, according to the World Bank, the ten cities with the highest levels of airborne particulates are all in developing nations. Growing population and vehicle use in these cities threaten to exacerbate the health problems caused by airborne emissions. Driving restrictions appear, at first glance, to be an attractive tool for dealing with such issues—attractive enough that programs similar to HNC already have been implemented in Bogota, Santiago, and Sao Paulo. Yet the resounding ineffectiveness of driving restrictions in Mexico City suggests that such programs are misguided. (Beijing's announced plans to restrict driving prior to and during the 2008 Olympics may be more effective; it is difficult to imagine many people purchasing cars to avoid a restriction lasting only a few weeks.)

It is well established that higher gasoline prices and electronic road pricing (time-of-day based tolls, for example) yield lower consumption of gasoline and lower emissions of harmful pollutants—and do so in ways that allow individuals maximum freedom in adjusting to the policies. Developing nations around the world are struggling to achieve improvements in environmental quality at the same time that population and living standards are growing. Programs such as driving restrictions, which lower wealth without improving air quality, hinder both environmental progress and economic progress. Surely the citizens of developing nations deserve better than this.

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Vacationers ski and sled in the village of Wengen, Switzerland.

PROTECTING FORESTS OF THE **SWISS** ALPS

BY MARTIN HOSTETTLER

In February 1999, winter hit Switzerland with a vengeance. The snowfall was nonstop, accumulating up to 250 inches in some areas. Damage from this massive amount of snow totaled nearly US\$600 million.



Spring in Wengen, Switzerland. Between the avalanche tracks, which reach all the way to the village, spruce forests serve as protection. Above the forest line, protective barriers made out of steel and wood prevent the scribing of avalanches.

XSpeed event (Verbier-Nendaz-Mt. Fort, Switzerland)



Larch protection forest at Zinal in the Val d Anniviers (Switzerland)



Eiger, Monch, and Jungfrau from Swiss hillside



Beech protection forest against rockfall (Lucerne, Switzerland).
© by Klaus Louis



Rockfall on May 31, 2006, which claimed two lives above the transalpine highway (Gurtellen, Switzerland). © by Canton Uri

Most of the destruction was the result of 1,200 avalanches, which blocked up to 100 roads and railway tracks, damaged 1,700 buildings, destroyed 3,500 acres of protected forest, and killed 17 people. But, all things considered, Switzerland got off lightly—and it has its forests to thank.

Aside from their sheer beauty, the numerous Swiss forests shield people from avalanches, falling rock, and other natural hazards. As a result, the management of these “protection forests”—forests that provide protection from natural hazards—has top priority within the Swiss forest policy at federal and local levels.

For many tourists, Wengen, located in the Bernese Oberland, is a car-free, idyllic resort in the heart of the Alps. Only the perpetual ice of the majestic peaks of the Eiger, Mönch, and Jungfrau indicate the hostile environment. Every January, underneath the Lauberhorn, the best skiers race at speeds of up to 100 miles per hour, down the longest ski run in the world. It is a place where natural hazards such as rock and snow avalanches and mud slides threaten people and the surrounding communities year-round.

Since trees offer practically the only protection from falling boulders and snow masses, the private and public forest owners manage the forests to protect the village rather than to produce commercial timber. For the forest to guarantee permanent protection, natural regeneration needs to be supported with regular cuts, and a heterogeneous stand structure needs to be maintained. The short vegetation period, however, leads to a very slow rate of tree growth and decades can pass before a new forest becomes effective. In the interim, windstorms or bark beetles may have devastating effects.

FALLING PRODUCTION

Until 50 years ago, protection forests were managed for commercial timber. Initially, local regulations prohibited the overuse of the forest as well as clear cutting. Later, national policy was implemented to prevent misuse of the forests. Nevertheless, comparable high prices for wood led to regular harvests even on the steepest slopes of the Alps—leaving protection in the wake of the forest industry.

Over the past several decades, the tide has turned. International timber markets and other factors like cheap oil and a growing living standard put massive pressure on alpine wood production and have led to an abandonment of wise forest management. Unfortunately, this generally advantageous aspect of economic development has also led to an increasingly unstable regeneration for many important protection forests. It would be financially impossible to replace all protection forests with man-made constructions to protect against avalanches and falling

rock. Thus, public authorities are confronted with the question of how to best provide proper management of the protection forests.

GROWING CONSTRAINTS

Protection forests are often private property. Although ownership structures are complicated, it is estimated that 67 percent of protection forests are privately owned and 33 percent are public. A forest policy based on Swiss classical liberalism naturally seeks to move away from any possible constraints. In contrast, the public aims to motivate forest owners with cash incentives and financial appeals in return for the proper management of protection forests, thus avoiding the state’s right to exercise eminent domain. Practical experience shows that this policy of paying annually more than US\$100 per acre of protection forest works quite well and eminent domain is considered the exception rather than the rule. With extended forest damage due to hurricanes and bark beetles, there is the tendency to impose more duties on forest owners to “clean up” their forests, diluting her or his property rights.

In recent years, there has been a political movement pushing for risk-based assessment and cost-benefit analyses to determine funding for protection forest projects in Switzerland. Without these criteria for allocating funds, some politicians and the forest service often pursue a slightly different agenda—avoiding politically unpopular decisions or directing too much funding into their region. As a result, politically well-organized small villages receive public funding for forest management, leaving larger ones lacking. A new risk assessment-based approach would improve the system.

MICROMANAGEMENT

Once the funding for the management of protection forests is secured, questions arise such as which silvicultural measures should be considered and with what kind of intensity? This question opens several issues: First, forest owners and their foresters have more information available to them than the funding authorities do, so owners tend to exaggerate the importance of costly measures. Second, the usefulness of the silvicultural measures is difficult to assess for everybody since as many as two to three decades may pass between when the first management measure is implemented and its outcome. Third, the assessment of the gained protection effect is linked to significant methodological difficulties such as determining what kind of stand structure is really needed to protect people and infrastructure. In addition, the entire forest industry has trouble applying economic thinking, such as weighing marginal costs against benefits. Due to these issues, protection forest



Chestnut forest above Brissago (Switzerland) protects the Ticinese village from rocks and water.



Steel-girded protection constructions in the fraction zone of an avalanche (Braggio, Switzerland). © by Brigitte Wolf.



Mountain harvester in use. © by François Fahrni Lyss/Lignum.

projects are often oversized and lack a clear purpose.

Fortunately, during recent years, finance politicians have delegated most of the funding distribution to the lower administrative levels within the cantons (states). With this, unjustified projects are not yet a thing of the past, but the cantons now have an easier starting position as well as the chance to learn from past mistakes of the federal administration micromanaging protection forest projects.

It is not easy for the cantons to promote the appropriate incentives. Subsidizing timber harvesting, for example, is an unsuitable measure because it does not efficiently allocate resources; the distribution of public resources should lead to a maximum reduction of risk and not to an increased utilization of wood. The public funding allocated to protection forests has led to unintended consequences. For example, outdated management techniques have survived and thus reduced the competitiveness of forest enterprises.

An interesting approach is the cantons paying lump sums to forest owners for a time period of ten years, with the amount of money dependent upon the achieved stand structure. But this approach inevitably leads to an ethical question for some forest owners: Why incur the costs to maintain a protection forest's vitality today if tomorrow government will restore the protection forest for free? Based on long-term considerations, this would mean that government should reimburse owners who effectively manage protection forests today. The owners could then take advantage of an incentive to further maintain the structure and regeneration of the protection forest and to invest in the respective measures.

TRICKY BUSINESS

Due to great economic wealth in Switzerland, it will certainly be possible to allocate sufficient resources for the prevention of natural hazards. But which measures may be used most efficiently to maintain protection forests in the long term is a subject of speculation. Each approach must be thoroughly tested prior to the assessment of its advantages and disadvantages. It remains to be seen if each canton can pursue its own strategy and if over the years experimentation via competition among bureaucratic systems may help uncover the appropriate social arrangement.



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BUILD IT AND THEY WILL COME

Something odd is happening in Delaware. Although, the fact that anything happens in Delaware strikes some folks as odd. At mid-day, in plain view, a barge chugs out into Delaware Bay and dumps a load of aging New York City subway cars into the ocean. According to state marine officials, this waste disposal operation has transformed an underwater desert into a marine oasis.

More than 650 aging New York subway cars are now strewn across the ocean floor off the Delaware shore, where they provide underwater housing of outstanding quality. Word of the luxury condos spread quickly; blue sponges and mussels staked out their turf on the walls of the subway cars, flounder snuggled into the silt that settles on the roofs, and sea bass set up housekeeping inside the cars. The landscaping features native plants, giving the artificial reef a more natural appearance. Sea grass grows in and around the subway cars, carpeting the ocean floor and gently swaying in the currents.

Unfortunately, the upscale residents who have settled at Red Bird Reef have become targets for some unsavory types. Open-ocean fish such as tuna and mackerel are known to sweep through the area, gobbling up some of the residents. And more unpleasantness has erupted on the ocean surface. Commercial fishermen have descended on the reef, eager to benefit from the abundance of fish and, in the process, have tangled with recreational fishermen. The *New York Times* reports that Red Bird Reef supports 10,000 angler visits a year, compared with just 300 in 1977.

Delaware's success in repopulating barren stretches of the bay did not go unnoticed by neighboring New Jersey, which has recently requested 600 of the retired subway cars. New York does not charge for the cars and also covers delivery. New Jersey's request was a poke in the ribs for New York, which announced it would soon stop giving away its aged subway cars, having realized that they are one of the state's valuable resources.

While many other items such as shopping carts, refrigerators, and washing machines have been used to build artificial reefs, subway cars offer several advantages. They do not shift easily in storms, can accommodate many types of marine life, and those with stainless steel exteriors are especially durable. Most importantly, marine life in the area has increased 400-fold per square foot since the creation of the artificial reef.



JUNK IS BIG BUSINESS

EBay still generates more revenue, but 1-800-Got-Junk is no slouch, with 300 locations in four countries and expected revenues of \$150 million this year. This company lends a personal touch to the overwhelming task of sorting and hauling away your junk. In some cases, it rescues people who are nearly drowning in their own stuff.

Brian Scudamore founded the company in 1989 with the high-minded goal of professionalizing the trash hauling business, according to National Public Radio. More than that, he saw a need and no one to fill it. In an increasingly materialistic world, lots of people go through life collecting stuff. When that stuff becomes heaps and mounds covering work benches, spilling out of boxes, burying desks, tables, and countertops, Got Junk is ready to lend a helping hand—for a price, that is. After the death of her brother, a Seattle woman paid \$1,200 to have his house and yard cleaned and all items disposed of in preparation for a listing with a real estate agent. The workers cleaned out the house in a single afternoon and even swept the garage before they left.

In a typical scenario, skilled employees in neat uniforms tackle the yard first, sorting through piles of lumber, old wood, broken lawn furniture and rusted garden tools. They unburden the garage of weed eaters, compressors, and tackle boxes, then move on to the attic and basement where they remove stacks of old magazines and newspapers, rolls of yellowed wall paper, and the baby's crib from 1945. Workers not only set aside valuable items, but determine what items can be recycled. The company estimates that as much as 60 percent of what appears to be trash can be recycled, resold, or reused. Of course, there are always exceptions such as urns of ashes, a truck load of denture molds, 18,000 cans of expired sardines, and a diffused bomb from World War II.

Yard sales are deeply embedded in American culture, but for those who haven't been able to park in the garage for five years, a visit from 1-800-Got-Junk could be well worth the price.

PURPLE LOVE GRASS VS. GERANIUMS

A 10-acre parcel of tall-grass prairie near Peoria, Ill., was just an afterthought for owners Jerry and Teri Whitledge. The couple operates ten retail stores called The Flower Shop and is a major Illinois wholesale distributor of bedding plants and perennials.

The Whitledges bought the property to expand their existing business. The *Peoria Journal Star* reports a four-stage plan was put in place to build a warehouse and distribution center, a retail store, fields for large-scale flower production, and finally a few display gardens to showcase tall-grass prairie. That afterthought has now become the cornerstone of a growing business in native prairie plants and entire tall-grass prairie landscapes.

Seeds planted just six years ago have already produced a robust and functioning prairie ecosystem. A pond on the property that was once thick with algae is now crystal clear. Water that once gushed out of drainage tiles from neighboring farm fields is completely absorbed by the burgeoning prairie. Meadowlarks and bobwhites, birds listed by the Audubon Society as declining in number, are settling into the protective switch grass. Other birds, including pheasants, blue herons, prairie sparrows, wrens, barn swallows, blue birds, and killdeer, are also adopting this small patch of tall-grass prairie.

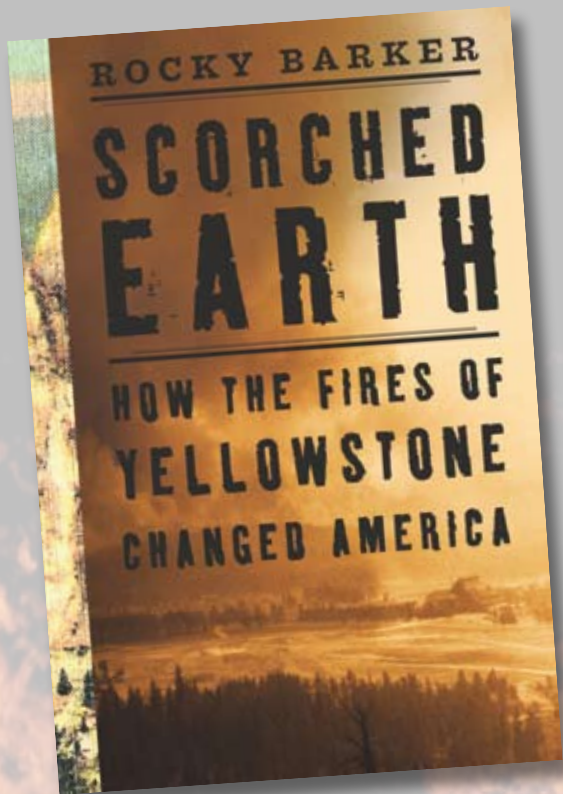
The birds are a delight to the Whitledges, bringing life, color, and song to land that was once a mono-culture. The birds also have healthy appetites, which has been a blessing in disguise. While most residents of central Illinois suffer through the summer swatting mosquitoes, Jerry and Teri are relatively free of the pesky insects.

The Whitledges' land not only attracts birds, but also lots of people from nearby towns. The more they learn about the grasses, forbs, and flowers, the more they appreciate the prairie that once spread across millions of acres, providing wildlife habitat, soaking up the rain, and protecting the soil with six-foot-deep roots.

Originally meant only as displays, the tall-grass prairie gardens have become a valuable educational tool. More and more people are abandoning their flashy zinnias and geraniums in favor of the subtle hues and ecological benefits of heliopsis, purple love grass, and other prairie plants. What Jerry thought would never happen has happened. Tall-grass prairie has gone commercial.



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