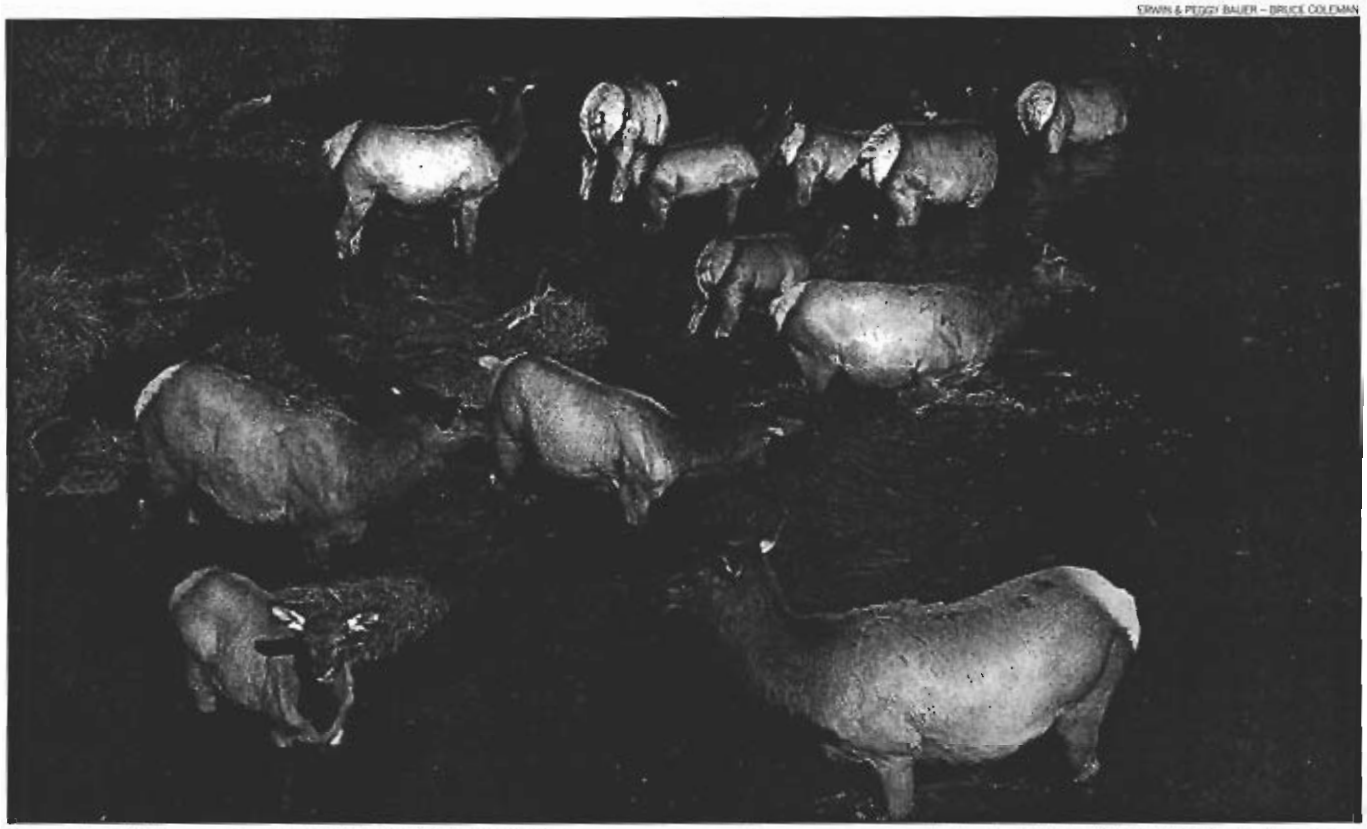
Yellowstone's unraveling

The ecosystem is in grave peril and the most damage is caused by elk

ERWIN & PEGGY BAUER – BRUCE COLEMAN



Munchies. *Elk's voracious appetites are tied to erosion, shrub and tree disappearance and the depletion of other animal species.*

Bob Beschta was standing on a gravel bar in the Lamar River along Yellowstone National Park's hauntingly beautiful northern range. Tourists hoping for a glimpse of elk or bison or even some of the park's newly released wolves kept pulling off the road and looking hopefully off into the distance. But Beschta was distinctly not enjoying the scenery.

"This is just off the charts," he said, shaking his head as he stared at a spot where the meandering river had cut deeply into the black soil on either side. "The banks are not capable of holding this channel in place anymore." Beschta, a hydrologist at Oregon State University's College of Forestry, had just become the latest convert to a growing cadre of ecologists, river experts, foresters and rangelands scientists who are convinced that there is something gone seriously wrong in the nation's oldest national park.

For years, environmental groups have fought a series of bitter actions against forces they see besieging the park from across its boundaries, threatening its spectacular mountain views, crystal-clear streams, geysers and hot springs and its irreplaceable wildlife. In their view, mining, logging, ranching and hunting are the enemies that have placed this sacred ground at peril; President Clinton's visit last month to announce a deal staving off a planned gold mine north of the park was hailed by park defenders as a major blow against the forces that threaten it.

Park policy. But to Beschta and many of his fellow scientists, the real danger comes from a very different source – one squarely within the park itself. They paint a bleak picture of an ecosystem literally unraveling, as stream banks erode, woody shrubs disappear, stands of aspens and willows die and many once abundant species from beaver to birds dwindle. The culprit they point to is elk – more particularly, National Park Service policy that has allowed elk numbers to increase from 3,100 in 1968 to some 20,000 today on the northern range.

"What they're changing this into is a lawn. There's more to an ecosystem than grass," says Charles Kay, a wildlife biologist at Utah State University and a leading critic of Yellowstone's management.

Kay has collected reams of evidence that he says documents the park's slow – and in some cases not so slow – ecological death. One of the most striking bits of evidence is an experiment the park itself conducted beginning in 1957. Hike back a few hundred yards from the horse stables at Mammoth Hot Springs and you run into an 8-foot-high woven wire fence enclosing 5 acres of towering aspen trees and thick underbrush. The fenced area, known as the Mammoth Exclosure, is not marked on any park maps or pointed out by rangers. But since it was erected 40 years ago, it has provided a year-by-year

PHOTOS BY CHARLES E. KAY

Vanishing aspen. 1. *Some hoped 1988 fires would clear the way for aspen regeneration.* **2.** *New growth emerges a year after the fire.* **3.** *But by 1991, elk have eaten the saplings and the aspens are gone.*

accounting of the devastating impact of elk grazing. Looking along the fence line, the difference inside and outside is almost beyond belief: Aspens, willows and woody shrubs are almost nonexistent on one side; on the other, they are too thick for a man to walk through. Where elk graze freely, nonnative plants like timothy, a coarse hay grass unpalatable to wildlife, cover the ground. Buffaloberry, an important food plant for bears and other wildlife, is sparse and denuded. Kay counted the berries on 60 plants inside and out. The total: 35,744 berries inside, 75 berries outside.

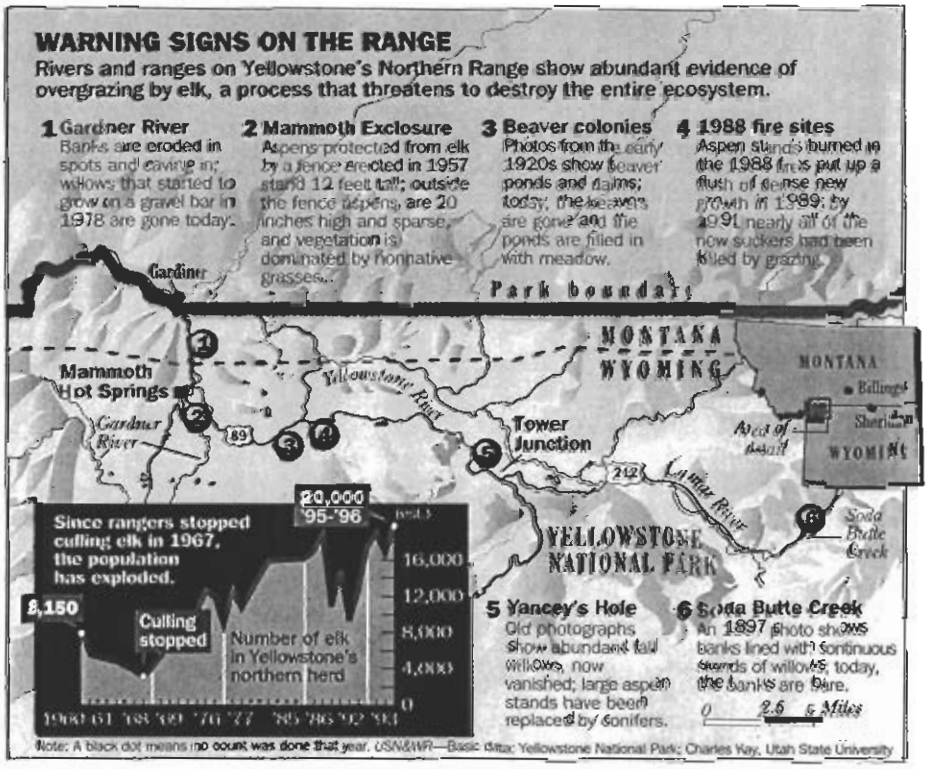
These changes are just the first link in a cascade of ecological consequences. The woody understory that provides food and habitat for mice, deer and many other small mammals is lost. Centuries-old aspen stands, which reproduce not by seed but by putting up new shoots, or suckers, die out, no longer able to regenerate under the intense grazing pressure. That eliminates food for beavers, whose numbers have plummeted in the park over the last 60 years. As the beavers vanish, so do their dams and ponds, which trapped silt and slowly built up streambeds over the 10,000 years since the glaciers retreated. Stream banks no longer held in place by aspens, willows and cottonwoods erode and collapse. As the channels lower, so do the water tables, making it all but impossible for water-loving willows to re-establish themselves along stream banks, even if the elk and their ravenous appetites were to vanish tomorrow.

Soil woes. Along the North Fork of Elk Creek, Beschta points to a channel that the stream has dug just within the last 10 years. Remnants of old beaver dams still can be seen in meadows that now fill the long vanished pond sites. But the stream itself has now carved a channel a good 6 feet deeper, exposing a layer of gravel left by the glaciers—10,000 years of work undone in a decade. "The vegetation is recoverable over a 50- to 100-year period," says Beschta, "but those soils are not."

Since adopting a policy of "natural regulation" or "natural process management" in the early 1970s, park managers have insisted that the huge increase in elk merely represents the ecosystem returning to its natural equilibrium. In the 1970s, park scientists argued in publications that, left to their own devices, elk have always struck a natural balance with their food supply—meaning that elk, almost by definition, cannot cause any long-term ecological disruptions.

Kay has challenged those findings sharply; after researching thousands of old photographs of the park and spending weeks hunting out exact sites where they were taken, he has produced about a hundred side-by-side comparison photos documenting a 96 percent decline in the area covered by aspens over the last century. In 20 detailed photographs taken in the 1920s, he was able to count the number of individual aspen trunks; returning to those sites, he measured an 85 percent decline in aspen numbers. Comparison of photos of beaver dams taken in the 1920s shows a similar pattern of decline. Repeat photos of stream banks show the near complete disappearance of once lush streamside trees and shrubs.

To the extent park officials acknowledge that a decline in woody streamside vegetation has occurred, they argue that elk are not to blame. Rather, they attribute it to climate change or to the long-



standing policy of suppressing fires within the park. John Varley, who directs the park's scientific research program, insists that "aspens have never been a prominent feature here for 10,000 years" and that their decline is a phenomenon taking place throughout the West. Varley says that while the difference in vegetation inside and outside exclosures may look striking at first glance, studies show that biodiversity has not suffered: "All the species inside are growing outside. Their stature is different, their structure is different, but they're still there."

Kay counters that all you have to do is look outside the park. Along Eagle Creek, on national forest land just north of the park in the town of Gardiner, Mont.—an area where about 3,000 elk are shot each year—aspen stands have regenerated, putting up a lush growth of new suckers. Many stands are crowded with a waist-high understory of cow parsnips, chokecherry and wild roses. A white-tailed deer bolts out of one of these shrubby thickets—something Kay says you won't see in the park, where the deer population has gone from 200 at the time of the park's establishment a century ago to virtually zero today. "Compared with Yellowstone, this looks like paradise," says Kay. "Eagle Creek has the same climate as the park, the same fire history, no cattle grazing—the *only* thing different is the elk."

Canada's burning. North of Gardiner along the Yellowstone River through private and national forest land, the Yellowstone River is lined with a thick band of willows, aspens and cottonwoods. Inside the park, the streams on the northern range are bare, with scant exceptions.

Recent experience of Canadian parks also tends to confirm Kay's view. Following the recommendations of Yellowstone scientists that aspens would regenerate with burning, even in the presence of heavy elk grazing, managers at Banff National Park in Alberta set fire to blocks of forest as large as 15 square kilometers. All of the new aspen growth was grazed to the ground. Those aspen stands now face extinction, the old trees killed by the blaze and the new suckers wiped out by the elk, with no chance for re-establishment—ever. "We're not academics, we're grunts," says Cliff White, park ecologist at Banff. "We're the guys doing the burning. And it doesn't work. Yet the literature says, 'Just burn and elk won't matter.' We'd have been better off doing nothing."

Under mounting criticism, the National Park Service has hinted that it may be willing to re-examine its policies; Associate Director Michael Soukup told the Ecological Society of America last month that "it is time" for open scholarly debate of the natural regulation policy. But the political reality is that natural regulation has proved far more popular with the public than did the park's old policy of culling thousands of elk each winter. Hunters in neighboring states like the abundance of game that flows out of Yellowstone. Animal lovers and many environmentalists despise the idea of rangers shooting big, beautiful animals in a place set aside for the preservation of nature. Tourists like the abundant viewing opportunities for wildlife in the park. To which Kay bluntly replies: "If you want lots of elk and bison to make the tourists happy, it's not a nature park, it's a theme park—it's entertainment. So you might as well let Disney run it." ■

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1893. ***A century ago, a military patrol passes a lovely willow stand (arrow) along a stream at Yancey's Hole. Now, the willows are gone because the elk eat the saplings.***

BY STEPHEN BUDIANSKY

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