

Committee on Resources

Witness Testimony

**TESTIMONY BEFORE THE U.S. HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON NATIONAL PARKS AND PUBLIC LANDS
OVERSIGHT HEARING ON SCIENCE AND
RESOURCE MANAGEMENT IN THE NATIONAL PARK SYSTEM**

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I would first like to thank the Chairman and the Committee for inviting me to testify here today. I have a B.S. in Wildlife Biology and a M.S. in Environmental Studies both from the University of Montana, and a Ph.D. in Wildlife Ecology from Utah State University. I am presently an Adjunct Assistant Professor in the Department of Political Science and a Senior Environmental Scholar at that University's Institute of Political Economy. I am the only independent, independently funded scientist to have conducted a detailed evaluation of Yellowstone National Park's "natural regulation" management program. Not only have I conducted scientific research on the elk overgrazing question, but I have also studied wolf recovery, grizzly bear management, the bison problem, and other key issues in that ecosystem. I have also traveled widely throughout the West and am familiar with similar resource management problems in other national parks. Moreover, I have conducted extensive research on long-term ecosystem states and processes in the southern Canadian Rockies for Parks Canada. This included work in Banff, Yoho, and Kootenay National Parks.

My research in Yellowstone and Canada has been widely published in books and scientific journals and I have submitted copies of those papers to the committee's staff. In addition, GAO is presently investigating the Yellowstone situation and I have submitted copies of my research to that agency as well. Moreover, I have volunteered to take GAO on a field tour of my study sites in Yellowstone next summer.

As you know, Yellowstone is presently managed under what is termed "natural regulation." This, though, is more than simply letting nature take its course for it entails a specific view of how nature operates. According to the Park Service, predation is an assisting but nonessential adjunct to the regulation of elk and bison populations. Instead, ungulates are limited by their available forage supply- -termed resource or food-limited. In other words, the Park Service contends that ungulate populations will self regulate without overgrazing the range. This means that if wolves are present, they will only kill animals slated by nature to die from other causes and thus, would not lower the elk population. In the debate over wolf recovery, the Park Service has adamantly denied that wolves are needed to control elk or bison numbers in Yellowstone Park. Instead, under "natural regulation," elk and bison die from starvation, and according to the Park Service, thousands of animals starving to death is natural.

Now, the Park Service is fond of saying that it has 3 million dollars worth of research which supports "natural regulation." Unfortunately, most of those studies have not directly tested "natural regulation" and have largely been a waste of taxpayer's money. Furthermore, the Park Service has refused to fund research that may prove "natural regulation" wrong and they have generally awarded contracts only to people who

produce results that support agency management. In the rare circumstance where a contractor has produced a report critical of park management, he has never received additional funding and his credibility has been attacked by the agency. In the equally rare circumstance where Park Service employees have dared challenge established agency dogma, they have been reassigned, force transferred, or suffered disciplinary action. The next witness, Dr. Richard Keigley, can address these points in detail since he has been the subject of internal agency harassment.

There is also the question of how the Park Service has awarded contracts to non-agency, supposedly independent biologists. Information on who applied for these contracts and how they were awarded is supposed to be available to the public. But when an associate and I filed a Freedom of Information Act (FOIA) request on three specific contracts, we were told the information was not available for public review, because the agency had given that money to the University of Wyoming and then the University, not the agency, technically awarded those contracts. And as we were told by a University Vice-President, the University does not have to comply with FOIA requests. This raises the question of why the Park Service chose to follow a procedure that hid the awarding of these research contracts from public review. At least two of the biologists who received those contracts have been repeatedly funded by the Park Service, and have since produced a series of reports favorable to the agency. In my opinion, this certainly does not qualify as an independent test of "natural regulation" management.

The Park Service's data supporting "natural regulation" is suspect because it cannot be replicated. A case in point is aspen, which has declined by more than 95% since Yellowstone Park was established. The Park Service has attributed that decline to the lack of lightning-caused fires which the agency claims are necessary to regenerate aspen--fire kills the old trees but then the aspen clone's roots send up a profusion of suckers, a process termed root suckering (aspen clones have not regenerated from seed for several thousand years due to the species' demanding seed bed requirements).

According to the Park Service, Yellowstone's aspen would successfully regenerate--defined as producing new stems greater than 6 feet tall--if those stands were burned. In fact, agency scientists have claimed for twenty years that their data proves burned aspen will regenerate in the park despite repeated elk browsing. They claimed to be stating a proven fact, not a hypothesis.

An independent test of the Park Service's claims was provided when Yellowstone's 1988 wildfires burned approximately one-third of the aspen on the park's northern range. After the fires, I established 765 permanent plots in burned aspen stands. Despite initial aspen sucker densities of over 50,000 stems per acre, I found that elk and other ungulates repeatedly browsed all those stems to within inches of the ground and prevented height growth. In fact, several clones have now been completely killed-out by repeated browsing. How then, could it be a "proven fact" for nearly twenty years that, if burned, Yellowstone's aspen would successfully regenerate despite abnormally high elk numbers? Clearly, there was something wrong with the agency's earlier "data." As it turns out, burning plus grazing are the worst things that can happen to the park's aspen.

The Park Service has not responded by rejecting "natural regulation" even though it is now clear an underlying part of that hypothesis has been falsified. Instead, the agency has proposed a new hypothesis. They now claim that aspen was historically rare in the park so the decline of aspen is evidence that "natural regulation" is returning the park to its natural state.

I and my co-workers tested this new hypothesis last summer. We used the same procedures the Park Service reported it had used to collect samples from aspen clones and we collected our samples in the same

areas used by the agency. We then sent our samples to an independent laboratory for analysis in a blind test. That is, the laboratory did not know where the samples had been collected or the hypothesis being tested. Thus, this was a truly scientific test of the Park Service's new hypothesis. We were unable to confirm the Park Service's new hypothesis. In fact, our data produced results entirely different from those obtained by the agency. Simply put, we could not replicate the data reported by the agency even though we used the same methods and techniques in the same study areas.

In science, if the same experiment or test is repeated, all the various data sets must support the same conclusion or the hypothesis must be discarded. Our data suggest that the Park Service's new hypothesis is, at best, suspect and does not absolve "natural regulation" management of aspen's continued decline in the park.

The Park Service has also systematically attempted to suppress the publication of research that does not conform to the agency's "natural regulation" management of the park. After the U.S. Forest Service and other public agencies spent several hundred thousand dollars on a moose study inside and outside Yellowstone Park, the publication of that research was blocked. The official explanation is that the Forest Service does not have sufficient funds to publish the final report, but I suspect the real reason is that work does not support "natural regulation" management- -please see Attachment B for details.

After I published an article critical of park management, representatives of the Department of Interior repeatedly called the University and asked them to fire me. They also repeatedly called Parks Canada, for whom I was conducting ecological research at the time, and asked them to fire me. Both refused. Then they called my Department Chairman and informed him that my research was endangering the lives of their people in the field because, and this is an exact quote, based on what I had written "those neo-Nazis in Montana were going to start shooting government officials." My "crime" Mr. Chairman, was to have published an independent analysis of wolf recovery in the park and other areas of the northern Rockies.

Having admitted to spending at least 3 million dollars of taxpayer's money on research in Yellowstone, you would think that the Park Service would have a detailed study plan of how all that work was designed to formally test "natural regulation" management. That, though, turns out not to be the case. In 1989, for instance, the Department of Interior's Inspector General conducted an audit of natural resource research in Yellowstone and three other national parks. The Inspector General found that "Yellowstone National Park did not have study plans for 23 of 41 research studies performed by its research staff. In addition, the study plans that existed for the other 18 research studies were generally deficient with respect to content." As the Inspector General pointed out, study plans are needed to ensure that research is conducted efficiently. The only time the Park Service has told the public exactly what is meant by "natural regulation," and laid out a detailed plan for its study, was 1971, and the agency subsequently never followed its own study plan. Instead, I am the only scientist who has systematically tested "natural regulation" management.

Alston Chase has called "natural regulation" a scientific fraud and from my own detailed measurement of vegetation in Yellowstone Park, I can say that I have found no evidence to support the "natural regulation" paradigm. Instead, all my data indicate that "natural regulation" must be rejected as a valid scientific explanation of the natural world.

As you know, riparian management has recently been a hot political topic in the West, with environmentalists blaming ranchers for overgrazing these critical habitats. So, as an example of what "natural regulation" means on the ground, let us look at the condition and trend of willow communities on Yellowstone's northern range- -please see Attachment A for additional details and references. Now if

"natural regulation" management represents the epitome of land management, as claimed by the Park Service and various environmental groups, then surely Yellowstone's riparian areas should be in excellent condition.

To test this part of the "natural regulation" paradigm, I (a) measured willows inside and outside the park; (b) measured willows inside and outside long-term ungulate-proof fenced plots, called exclosures, on Yellowstone's northern range; (c) measured willow seed production inside and outside park exclosures; and (d) compiled repeat-photographs to measure long-term vegetation change.

Based on 44 repeat photosets of riparian areas on the northern range, tall willows have declined by more than 95% since Yellowstone Park was established in 1872. In 28 repeat photosets outside the park, tall willows had not declined, but, if anything, had increased. That these differences are due to excessive browsing by Yellowstone's burgeoning "naturally regulated" elk population, not other environmental factors as postulated by the Park Service, is shown at the park's exclosures.

On permanent plots outside exclosures, willows averaged only 13 inches tall, had only 14% canopy cover, and produced no seeds. In contrast, protected willows averaged nearly 9 feet tall, had 95% canopy cover, and produced over 300,000 seeds per square meter of female canopy cover- -in willows there are separate male and female plants. Not only are Yellowstone's willow communities severely overgrazed, but they are among the most overgrazed in the entire West. This has had a devastating effect on riparian songbirds and other animals.

Beaver, for instance, were once common in the park but that species is now ecologically extinct on the northern range because overgrazing by an unnaturally large elk population has eliminated the aspen, willows, and cottonwoods beaver need for food and dam building materials. Without beaver in the system, park streams have down cut, which has lowered water tables and destroyed more riparian vegetation. Beaver is also a critical keystone species whose loss has seriously reduced park biodiversity.

The roots of willows, aspen, and cottonwoods are also critical in maintaining streambank stability, and as elk have eliminated these woody species, this has produced major hydrologic changes. Dr. David Rosgen, one of North America's leading hydrologists, for instance, reported 100 times more bank erosion on Yellowstone's denuded streams than on the same willow-lined streams outside the park.

Last summer, I took Dr. William Platts, one of the West's leading riparian experts, and Dr. Robert Beschta, a hydrologist at Oregon State University on a three-day field tour of sites inside and outside Yellowstone Park. What they saw shocked them. After looking at one stream that had blown out and eroded down to Pleistocene gravels, something that has not happened in 12,000 years- -all because the elk had destroyed the woody vegetation that once protected the stream banks, these experts declared that if you gave them a billion dollars they could not put the system back together again. This then is the type of resource damage that has occurred under "natural regulation" management. I submit that not only must "natural regulation" be rejected, but that what has happened in Yellowstone is a clear violation of the park's Organic Act, the Endangered Species Act (see Attachment B), and other federal legislation.

The Park Service, however, has responded by producing a series of research studies that blame these problems on factors other than "natural regulation" management. However, bad science leads to bad policy, and if you do not follow proper scientific procedures, or don't measure the correct variables, or don't have a large enough sample size, what you invariably get is junk science.

Elk-induced soil erosion has long been a concern in Yellowstone, but the agency claims recent research has proven that the park's burgeoning ungulate populations have not caused accelerated soil erosion. A careful review of the Park Service's data, however, shows that not to be true.

In their work, the Park Service used a simulated rainfall machine to measure soil erosion inside and outside Yellowstone's long-term grasslands exclosures. The rainfall simulator was set at the rate of one inch per hour and was run for 15 minutes on a 26X26 inch square plot. This automatically biased the study, though, because it is standard scientific practice to use a rate of 2.5 inches per hour for 15 minutes. A lower simulated rainfall rate automatically guarantees less soil erosion.

The Park Service then measured soil erosion on five outside plots and five inside plots per exclosure and found that there was more erosion on outside plots, which have a long history of heavy elk use, than on inside plots, but reported that difference was not statistically significant. Yellowstone's superintendent then publicly proclaimed the agency's research had proven there was no accelerated erosion in the park. That, though, is incorrect, as the Park Service grossly misrepresented the results of their research.

To statistically compare the average amount of soil eroded from inside versus outside plots, the samples' variances are used. If those variances are high, as they invariably are in soil work, and sample size is low, like say only five samples, then God himself could not generate statistical significance. So while it is true that statistically the agency's data showed no increased soil erosion on grazed plots at each exclosure, that does not mean elk have not caused widespread soil erosion in the ecosystem.

This is what mathematicians call a Type II error- -concluding that there is no significant difference, when in fact there is. To correct for this problem, the Park Service should have measured more plots inside and outside each exclosure, but it did not- -I suspect because those data would have embarrassed the agency. However, if you combine that study's original data inside and outside all the exclosures that were measured, which effectively increases sample size, then the agency's data shows significantly more soil erosion from heavily grazed sites. When it rains, I have watched mud flow off Yellowstone's hillsides and it is not uncommon to find exposed tree roots in the park.

The Park Service, however, continues to deny that Yellowstone is overgrazed, or that if it is, "natural regulation" is to blame. The agency, though, has not been receptive to independent review of its "natural regulation" program. In the early 1990s, the Society for Range Management, the Ecological Society of America, the American Fisheries Society, and the Wildlife Society asked the Park Service for approval to conduct an independent review of the Yellowstone situation, but they failed to obtain permission. More recently, a group of preeminent ecologists informed the Secretary of Interior that they would be willing to serve, without pay, on a panel to review the entire Yellowstone matter, but the Secretary declined.

Now if the Park Service has nothing to hide, and actually has the research to support its claims regarding "natural regulation," why then have they not welcomed an independent review of Yellowstone's management? If, on the other hand, as I have argued, "natural regulation" is the greatest threat to Yellowstone Park, then it is easy to see why the agency attempts to prevent Congress and the American public from knowing the truth. In my opinion "natural regulation" is also a failed environmental philosophy, which explains why environmental groups such as the Greater Yellowstone Coalition have largely ignored the resource damage that has occurred in the park (please see Attachment A for details).

Moreover, this problem is not confined to Yellowstone but is endemic throughout our National Parks System. Dr. Carl Hess, for instance, has documented how "naturally regulated" elk have overgrazed

Colorado's Rocky Mountain National Park, while Dr. William Bradley documented the negative impacts abnormally large elk populations are having on subalpine meadows in Washington's Mount Rainier National Park. Similarly, "naturally regulated" elk populations have had a dramatic impact on understory species composition and tree regeneration in Washington's Olympia National Park. While in New Mexico's Bandolier National Monument, elk-induced soil erosion is threatening that park's archaeological resources.

The simple truth is that ungulate populations will not internally self-regulate before those animals have had a serious impact on the vegetation. Now, wildlife biologists often cite Africa's Serengeti as an example of how North America must have looked before it was despoiled by Europeans. The Park Service, in fact, has not only claimed that Yellowstone National Park is the last remnant of North America's Serengeti, but the agency has actively recruited Serengeti scientists to support "natural regulation" management. Today's Serengeti, however, is not a natural ecosystem, nor is it a vignette of "wilderness" Africa. Instead, the Serengeti is a romantic, European, racist view of how "primitive" Africa should have looked, for one of the first things that Europeans did when they created Serengeti and other African national parks was to forcefully remove all the indigenous peoples. For various reasons, colonial governments did not want black Africans in their white national parks.

Now, there have been hominoid predators in Africa for at least 3.5 million years, and our species, Homo sapiens, evolved in Africa 100,000 years ago. Thus, I submit that there is nothing more unnatural than an African ecosystem without hominoid predators and the Serengeti, therefore, is not a "natural" ecosystem nor is it an example of how North America teemed with wildlife before the arrival of Columbus.

In all the ecological studies that have been done on the Serengeti, native people have generally not even been mentioned, or if they have, it has invariably been as "poachers," in the pejorative sense. Based on recent modeling, it has been suggested that Serengeti's wildlife populations will collapse if present levels of "poaching" increase by as little as 10%. While others may view this as "poaching," I suggest that this is a case of native people, who are simply exercising their aboriginal rights.

As I have documented elsewhere, elk and bison never historically overgrazed Yellowstone or other National Parks because native hunting kept ungulate numbers low. That is to say, hunting by Native Americans actually promoted biodiversity. Giving Yellowstone's bison additional areas to roam outside the park, for instance, will never solve the bison problem. For under "natural regulation," bison numbers will simply increase until the starving animals again move beyond whatever boundary has been set.

Thus, I respectfully offer the following recommendation for Congress' consideration:

(1) Congress should mandate an independent park science program. This is the same conclusion that has been reached by every panel that has ever reviewed Park Management. Since the Park Service has never followed any of those recommendations, I submit that Congress must legislate the needed changes, for the agency has repeatedly demonstrated its refusal to comply with anything less. Because of the politics in Yellowstone, I also suggest that Congress appoint an independent panel of eminent scientists to set priorities for park research and to review/approve competitive research proposals for funding, similar to what the Bureau of Land Management did with wild horse and burro research.

(2) In addition, I suggest that Congress appoint an independent commission to review "natural regulation" management and park science in Yellowstone. What I am asking is for a fair impartial hearing of the available evidence, which after all is the American way. If we cannot straighten out Yellowstone, Mr. Chairman, there is little hope for the rest of our national parks.

(3) Furthermore, I would suggest that if you want independent scientists to critically evaluate various aspects of park management then Congress must establish a mechanism to directly fund that research. This need not come from new appropriations but from a reapportionment of existing funds. Money, after all, may be the root of all evil, but it is also the root of all science. Without adequate funding there will be no independent evaluation of park management.

(4) And finally, I invite you Mr. Chairman and others on your committee to personally tour Yellowstone with me this coming summer. At least one U.S. Senator has already asked me to accompany him on a fact finding tour of the park's northern range. It is quite an educational experience to be standing on a site and to be handed a photograph of how that area looked back in 1871. I wager, Mr. Chairman, that you will never view park management in the same light again.

We simply need an impartial review of the available evidence. For Mr. Chairman, if we can not agree on the science, then we surely can never reach agreement on how our National Parks should be managed to insure that they will be unimpaired for future generations of Americans.

Quite honestly, Mr. Chairman, based on what I know about "natural regulation" management, if I wanted to protect an area, the last thing I would do would be to make it a national park, and the next to last thing I would do would be to turn it into a wilderness area. I believe that our natural resources should be protected and America's heritage preserved, but that management should be based on the best available science, not on romantic, often religious, views of nature.

Thank you for your time and consideration.

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