

Connecting Islands of Hope in a Raging Sea

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When I listen to my introduction and biography at these events, I'm always a bit shocked at how often I've moved from one type of position to another through my career. I'd like to think that this pattern is due to a versatile intellect and an inclination to seek and embrace new challenges, but there are those who might argue that I simply become bored easily. I don't believe that is true, but even if that evaluation had some merit, I can assure you that there are some things in this world that I will never tire of exploring and thinking about—these include the Galapagos Islands, the Cockscomb Basin of Belize, the Serengeti-Mara and Greater Yellowstone Areas, and, of course, my wife Penny. Each is beautiful, wild and therefore unpredictable, and at times more than a little dangerous! I am delighted to have the opportunity to consider two of these this evening.

When we opened the Draper Museum of Natural History last year, we were in a bit of a quandary. Our staff and Trustees at the Buffalo Bill Historical Center felt very strongly that the Draper's focus should be the Greater Yellowstone Area. To some, that appeared a bit myopic – after all, the great natural history museums established a century ago aspired to bring the world to their communities. Our thrust was quite the opposite—to showcase one particular region to the world. But our rationale was that the Greater Yellowstone Area is a global resource and treasure, and by exploring this resource in depth, we could reveal global connections—connections binding human

cultures with nature. Our quandary was how to kick off the Draper Museum in some tangible way that expressed our global, interdisciplinary perspective. Our solution was to feature an internationally known figure who could help us articulate that message by his or her very presence. Our first choice was Richard Leakey, and he graciously accepted our invitation to help open the Draper. Richard was subsequently interviewed for an article published in *Yellowstone Science*, and I believe his presence and interview helped in some way create or at least support the theme of this conference. . .no doubt from ideas and projects that have been brewing for many years in the minds of people like John Varley, Glenn Plumb, and Lisa Graumlich, among others. I should admit that we lured Richard to the Draper and to this region initially with the opportunity (he says guarantee, by the way) to see grizzly bears. Of course, we failed to produce any bears during his short stay last year. So, this year, we lured him back for this conference with the opportunity (he insists promise) to see wolves. Again, despite the best efforts of many, including Glenn Plumb and John Varley, we failed. Next year, Richard, we hope you will return to see bears and wolves together, perhaps with a cougar thrown in for good measure.

I was invited to speak to you this evening to help set the stage for the next two days of this conference. . .to explore connections between two places in the world, the Greater Yellowstone Area and the Greater Serengeti-Mara Area, that on many levels are as different as night and day. They are located on different continents and separated by vast oceans. The indigenous people in the two regions differ greatly from one another in ethnicity, history, language, and culture. Current prevailing regulatory bureaucracies, though derived and flavored heavily from a common European or Caucasian spice pot,

represent distinctly different recipes. These two places represent biomes and wildlife assemblages bound by processes common to life throughout the globe, but differing significantly in species composition, diversity, dynamics, and biological productivity.

Yet there are profound connections between these two world treasures. Though as ecologists we may wince at the term, there may be some basis for regarding Yellowstone as the “Serengeti of North America”. Indeed, the thesis I’d like to advance this evening is that the fundamental connections between these two magnificent places are far more profound than the differences, and recognizing and reinforcing those connections is far more important today than in any time in history. Each of these places individually represents an island of hope for long-term wildlife and wildlands conservation, and each is confronted with essentially the same raging sea of challenges, though they may be manifested somewhat differently.

Before developing these specific points further, however, I’d like to digress for a few minutes to introduce you to another island of hope that might help provide perspective on both the challenges and opportunities connecting the Yellowstone and Serengeti areas.

In 1990, I left a tenured university position to assume the dual position of curator of ornithology and chairman of zoology at the Denver Museum of Natural History. As much as I enjoyed academia, I was anxious to be involved again in large-scale public education—as I had been even long before graduate school. I was also anxious to pursue a growing research interest focused on teasing apart ecomorphological relationships among bird and mammal assemblages along an elevational gradient. The Rocky Mountains of Colorado provided an ideal setting for this work. But a funny thing

happened on the way to the high country; I was waylaid by an unlikely island of hope on the plains just east of Denver. A U. S. Fish and Wildlife Service biologist introduced me to this place in a phone call when he invited me to tour a future wildlife refuge that was once deemed one of the most polluted areas on the face of the earth. The paradox was intriguing, but, frankly, I would not have agreed to a tour so quickly if it hadn't been for the insistence of my colleague on the phone.

During my first tour of the Rocky Mountain Arsenal, I found a complex of buildings interspersed with a mixture of native shortgrass prairie broken by cottonwood riparian corridors and disturbed areas dominated by cheatgrass and other invasive species. Most of the buildings were abandoned. They had once been the site of chemical weapons production—everything from mustard gas to various nerve agents. The Rocky Mountain Arsenal was established shortly after the beginning of World War II to help develop weapons for the Allied war effort. After the war, the Arsenal was leased by private companies to produce chemical pesticides for agriculture. Toxic wastes from both weapons and pesticide production were simply dumped on the Arsenal property. That was standard operating procedure during those naïve times. Amid reports of waterfowl dying or flying into buildings after landing on Arsenal ponds and groundwater contaminating crops on nearby farms, chemical production and dumping was halted, and access to the site was restricted even further. The Arsenal was eventually named a federal Superfund site and slated for cleanup. But nobody could decide how clean the area should be nor what the area should eventually become. Some people argued for a children's park, some argued for low-income housing, some for an industrial park, some for agricultural use, and so on. Several state and federal agencies were involved, and

lawsuits seemed to be springing up everywhere. By the time I arrived in Colorado in 1990, the proposal that at first seemed to be the most unlikely was gaining momentum. That proposal was to turn the Rocky Mountain Arsenal Federal Superfund Site into the Rocky Mountain Arsenal National Wildlife Refuge. Which brings me back to my first tour of the Rocky Mountain Arsenal. In addition to the buildings and mixed vegetation I saw on that cold January day, I recorded 31 mule deer, two white-tailed deer, 12 cottontail rabbits, five black-tailed jackrabbits, four coyotes, one badger, three active prairie dog towns, 62 ferruginous hawks, three red-tailed hawks, three rough-legged hawks, and 19 bald eagles. Now that's a decent day afield anywhere, but what makes it truly remarkable is that the Rocky Mountain Arsenal is a tiny, 7000-hectare island surrounded by commercial developments and intensive agriculture within about 16 kilometers of downtown Denver and in the midst of a sprawling metroplex of some three million people. This small area had become a de facto refuge for wildlife because it was the one area of this size (ironically due to the restrictions associated with a contaminated military installation) that had not been fragmented and developed.

The Rocky Mountain Arsenal became the unlikely focus of a massive conservation effort supported by the National Wildlife Federation, National and Denver Audubon Society, National Fish and Wildlife Foundation, U. S. Fish and Wildlife Service, among others. I became intrigued by the challenges of creating an island wildlife refuge in a heavily contaminated Superfund site, and had the opportunity to direct a series of wildlife-habitat studies and educational programs related to the site. Amid continued challenges from some development interests, legislation was introduced by both Colorado republican and democratic legislators and passed by the U. S. Congress

to establish the Rocky Mountain Arsenal National Wildlife Refuge pending appropriate contamination cleanup and habitat restoration. The process is expected to take 15-20 years. In the meantime, the area is known as the Rocky Mountain Arsenal National Wildlife Area under the joint authority of the U. S. Fish and Wildlife Service and U. S. Army, and attracts tens of thousands of visitors yearly. It has become a highly valued community resource for local residents and visitors alike to learn about and experience a small vignette of the shortgrass and mixed grass/shrubland ecosystem of the western Great Plains of North America. Admittedly, it remains a highly compromised environment, but that's what makes this story so poignant. How is it that such a compromised environment has become so valuable to wildlife and to people? To the residents of the Denver metroplex, the Rocky Mountain Arsenal has become an island of hope – a remnant – a pale vision, really, of a native biome that has all but disappeared from North America. Larger, less impacted tracts of native grasslands remain in some areas of west-central North America, but nothing that truly reflects the pre-Columbian diversity and dynamics of this biome. From an ecological point of view, it was the once-expansive Great Plains grasslands, rather than the uplifted plateau of Yellowstone National Park, that most nearly warranted the designation “Serengeti of North America”. Unfortunately, no one saw fit to value and preserve a large expanse of Great Plains grasslands before they were altered and fragmented by intensive livestock grazing, agriculture, and urban and suburban sprawl.

We're here this week because visionaries more than 100 years ago recognized the value and the vulnerability of some natural systems and created the powerful idea of a park—a national park—to preserve the integrity of a functioning ecosystem.

Yellowstone National Park was established in 1872 to become the world's first national park and at least the symbolic model of all national parks to follow. Initially protected for its active thermal features, Yellowstone has become increasingly valued as a refuge for the suite of native wildlife that once occupied a much broader temperate landscape in the intermountain region of western North America. Yellowstone National Park (900 thousand hectares) has become the centerpiece of what is generally termed the Greater Yellowstone Area (GYA – 7 million hectares)—often described as encompassing the last, large, nearly intact native ecosystem in the northern temperate zone of the earth. The GYA covers portions of three states and includes all of Yellowstone and Grand Teton National Parks, portions of six national forests, two national wildlife refuges, lands managed by BLM, Indian reservation lands and substantial state and private lands. Only 6% of this land is in national parks, 34% is privately owned.

The Serengeti-Mara Area (SMA), defined by the movements of the migratory wildebeest, covers roughly 2.5 million hectares, and like GYA, crosses several jurisdictional boundaries—including the two sovereign nations of Tanzania and Kenya. The SMA includes Ngorongoro Conservation Area, Maswa Game Reserve, three game controlled areas in Tanzania, the Masai Mara National Reserve and adjoining group ranches, and, of course, the Serengeti National Park (1.5 million ha). The Serengeti was afforded national park status in 1951 with extensive boundary modifications in 1959. The SMA supports the largest herds of migrating ungulates in the world and one of its highest concentrations of large predators – both carnivores and raptors.

Both Yellowstone and Serengeti National Parks are recognized as Biosphere Reserves and Natural World Heritage Sites. Each has become an icon of conservation

the world over—arguably the two most widely celebrated natural preserves in the world. And if Rocky Mountain Arsenal is an island of hope for the Colorado Front Range, GYA and SMA are islands of hope for the world.

Of course, they differ in some obvious ways. The GYA occupies a largely mountainous landscape dominated by coniferous forest. Only about 20% is covered by grasslands and these are cool, temperate grasslands. In contrast, SMA occupies a broad, sloping plateau covered almost entirely by warm, tropical grasslands and savannah. Where the Serengeti-Mara supports more than two million ungulates of thirty-one species, fewer than a half million ungulates of eight species occupy the GYA.

Creation of both Yellowstone and Serengeti National Parks displaced indigenous residents. But more than 100 years have passed since Native American people and traditional lifestyles have been displaced and largely replaced with EuroAmerican ranching, farming, and other land uses outside protected areas; this latter culture, though relatively recent, is firmly entrenched and exerts profound influences on land use and wildlife management issues in the region. Maasai pastoralists and other Native Africans continue to have a significant presence in the SMA, though traditional land use and lifestyles have changed. Tourism is important to both areas, and both attract worldwide audiences. But SMA is far more dependent on foreign tourism.

Despite these differences, there are some well-documented underlying similarities, particularly involving certain grazing ecology and dynamics. Seasonal and geographic variations in forage characteristics within each region require ungulates, and the omnivorous grizzly bear in the GYA, to range widely to make most efficient use of

foraging opportunities. The large herbivores help regulate grazing ecosystem processes in each area, but they along with the large predators that track them, help create common conservation challenges that connect the GYA and the SMA. The point is that success of the parks, themselves, as wildlife reserves, depends to a large extent on land management and other human activities not only within the parks but in broad buffer zones that are defined by park wildlife needs. And here is where Yellowstone and Serengeti are so intimately connected—by the general nature of the challenges they face. These challenges may be shared by other national parks and reserves throughout the world, but it is in these most celebrated parks—where the world focuses so much hope for identifying and meeting these challenges.

Many of the challenges to wildlife conservation in GYA and SMA are ecological, to be sure, but they are also economical, sociological, ideological, and educational. I suspect many of us who have taught courses in wildlife management have begun the course with the rejoinder that successful wildlife management includes a healthy dose of people management. Today more than ever, humans are a critical element in wildlife conservation and management, and there are no more high-profile proving grounds than GYA and SMA.

To summarize a bushel of challenges in a thimble, there are simply increasing human demands on landscape and resources adjacent to and intimately tied to the parks. Private land-use practices that may have presented little threat 100 or even 20 years ago, are now a much greater threat because of the sheer number of people and the movement away from mere subsistence living toward mass production/extraction. In both GYA and

SMA, largely open, natural landscapes surrounding protected areas that help support park wildlife, are being changed in character. Symptoms include sprawling settlements and residential development, poaching, logging and other extractive industry, invasive species, and wildlife diseases. Adjacent landowners often view wildlife as a source of livestock diseases, competition for grazing, threats to crops, depredation on livestock and pets, and even threats to human life. Park managers must also deal with inherent natural processes—wildfire, drought, long-term climate change, predator-prey and grazing dynamics—that sometimes present management, or at least public relations challenges in compromised nature. Managers must also monitor, evaluate, and mitigate impacts from park visitors as they demand increasing access to park resources and experiences. The task is made more difficult by a chronic lack of adequate resources, often allocated through political ideology and even out-and-out corruption, rather than management needs.

While those living around national parks stand to gain the most from landscape aesthetics and tourism economy provided by the parks, they are also most vulnerable to land-use restrictions and wildlife-related impacts connected to park management. In general, financial incentives are greater for landowners to manage their land for farming or ranching, or subdivide it for housing than to manage it for wildlife conservation.

In some ways, the financial challenges may be easier than ideological ones. This is particularly true for the GYA, where long-held distrust and antipathy for the federal government, fears of losing personal property rights and personal freedoms, a deeply held fear and loathing toward predators, and cultural clashes between American Western

neotraditionalists and conservation advocates create obstacles for wildlife and landscape conservation supporting national park goals.

Let me relate the gist of a recent conversation I had with a friend of mine who happens to be a local rancher/outfitter. He was complaining to me about wolves and grizzlies in his elk hunting area. He didn't like having to spend so much time and energy protecting his clients and campsites from grizzlies, and he was worried that the combined predation from grizzlies, cougars, and now reintroduced wolves, would reduce his and his clients' elk hunting success. He had already lamented the fact that the number of hunting clients had been declining, and that they tended to be older and more difficult customers to deal with. I agreed that recovered grizzly and wolf populations might make elk hunting more of a challenge and that the current, very liberal, elk hunting regulations might be modified in the future. But, I pointed to a few hunting outfitters who have been very successful branching out to include backcountry natural history expeditions, including wolf- and bear-watching opportunities for clients. At least one former hunting outfitter in Wyoming has chosen to specialize in these kinds of experiences for clients. My friend was appalled by my suggestion, shook his head, and said: "That's just not the cowboy way!" At least for this guide/outfitter, his interpretation of his cultural identity outweighed economic, or even logistical pragmatism.

If, indeed, GYA and SMA are connected via common challenges to wildlife conservation, how do we stand to benefit from exploring those connections together? The obvious potential benefit is to increase opportunities for articulating problems and finding solutions. We've all walked the path between the ponds of strict protectionism and community-based cooperation and dangled our toes in each to test the temperature.

Many of you carry the scars to prove it! We've emerged with new lessons about the right times, places, and methods to immerse ourselves in each pond. Sharing those lessons across a broader experimental field may help us identify general patterns and shape future applications.

Exploring and nurturing connections also helps to focus broader attention on both the importance of these areas and the challenges they face. It helps reduce the isolation of islands of hope, places local obstacles to conservation in a much larger global context. Just as creating connections between geographic islands encourages gene flow and reduces the chances of species extinction in a rapidly changing environment, forging intellectual connections between disjunct conservation reserves encourages the flow of ideas and solutions, and reduces the chances of failure in creating sustainable wildlife conservation strategies in a world of increasing human demands. A broader dialogue also helps identify sweeping threats to conservation, e.g., global climate change, beyond the local context.

If our overarching goal is to create sustainable wildlife conservation strategies, then our objectives should include:

- improving our ecological understanding;
- improving our economic understanding;
- improving our cultural understanding;
- reducing ecological barriers to conservation by employing ever more effective wildlife management practices;
- reducing economic barriers to conservation by creating financial or other compensatory incentives where possible;

- reducing cultural barriers to conservation through community involvement, education, and protectionist regulations, as appropriate.

Judging from the abstracts, the presentations, panels, and posters featured at this conference address these objectives and will hopefully provide object lessons for future work and application. I am anxious to hear from this distinguished gathering of thoughtful people.

Before I leave the stage, I would be remiss if I didn't pound one drum that I think is too often overlooked and marginalized in scientific and conservation circles: the importance of public education, particularly by museums and other similar, non-governmental institutions. Education is far too important to occur only in classrooms. Public museums and similar institutions are in a unique position to attract, engage, and inform. Museums are now addressing conservation issues and the connections between people and nature like never before. My own institution was conceived with the vision of integrating natural sciences with humanities to explore and inform about conservation issues through exhibits, field experiences, courses, conferences, lecture series, and other venues. We've only just begun, and have a lot to learn and to do, but we've made some inroads in what many of you know is a difficult cultural and politically charged environment.

Finally, I hope you will indulge my thoughts on a key role for scientists and scholars in resource conservation. It seems to be a conspicuous thread running through the tapestry of issues featured in this conference. In my mind, advocacy for a particular position or policy is a personal matter appropriately pursued by anyone as a private citizen. But I strongly believe scientists and other scholars have not only the opportunity

but also the professional responsibility to interpret their work and unique level of understanding for the public—to seek out and help replace dogma with information in our fields of expertise. Just as bad things often happen when good people do nothing, bad environmental policy happens when informed professionals don't share their knowledge. Science is poorly understood by the general public in part because there are so few working scientists willing or able to communicate effectively in public venues and truly connect with lay audiences. Aldo Leopold, among others, clearly recognized and worked to improve this situation in the 20th century. I am fortunate to be married to a very bright, highly professional and competent journalist, but I believe we continue to rely too heavily on journalists to interpret newsworthy scientific information to the public.

Thirty years ago, when I first considered becoming an ecologist, I read an editorial in a professional newsletter that sticks with me today. The author argued that what society needs/wants from ecology is predictability. I think much the same thing can be said today of the interdisciplinary realm of natural resources conservation. I believe that among our most critical responsibilities is to explore and clearly inform policy-makers, managers, and the general public regarding what we know (and don't know) about the ecological and socioeconomic consequences of human activities and proposed policies. We do not always have the opportunity to make policy decisions, but we should do everything in our power to ensure that the public and public policies are adequately informed. The Greater Yellowstone Area and the Serengeti-Mara Area are certainly two of the most important laboratories in the world for creating and applying information about how nature works and the ecological and cultural consequences of human actions.

Thank you for your attention and indulgence—I am looking forward to learning from you and sharing ideas over the next few days.