

## CHAPTER ONE

# Brink

*I hope that you will not . . . mar the wonderful grandeur, the sublimity, the great loneliness and beauty of the Canyon. Leave it as it is. You can not improve on it. The ages have been at work on it.*

Theodore Roosevelt

This faint old path isn't on the brochure map, but it leads to a fine perch just the same. Moving past the car choreography and selfie poses at the popular Desert View area near the eastern border of Grand Canyon National Park, I find my way on a late afternoon.

Crumbling pavers end in a trace that weaves through rabbitbrush and juniper and over to a suitable rock, right on the abyss. No glance out there yet. I don't want to risk vertigo until I'm settled. Then, with a beer and a bag of salt peanuts, I can drift out over two billion years of geology, a hundred centuries of human striving, and a timeless void.

Anywhere you pause along the countless miles of edge brings dizzying contrast. The infinitesimal meets the cosmic, as a cliff swallow careens against far-off rock and sky. The immediate—check your footing on that limestone grit, there's a long fall pending—opens abruptly onto silent eons of cycle and revision. Another contrast: under a longer gaze the wild and timeless look of this panorama bears the lasting marks of recent human activity. They are the destinations of this book.

If you were to make your way along this edge with me, for example, your line of sight would sweep out across the immense Venus, Apollo, and Jupiter Temples; the striated vanes of the Cardenas and Escalante

Buttes; and the Tanner side canyon with its own side canyons and their side canyons falling away below in a ragged regression. Across the main Canyon, out on the high North Rim, a horizon of cool evergreens beckons, albeit through ten miles of haze.

Somewhere over there an odd tribe of hybrid beefalos romps and ruminates. With luck we might spot a condor, one of a small number that have been arduously and expensively reintroduced to the Canyon region after the species was shot and poisoned to near-extinction.

The sun eases into a quickening descent. Shadows overtake the nearer depths and climb toward me. From somewhere near come the startling whumps of an air-tour helicopter. Far below and barely visible, the bone-cold blue curves of a segment of the Colorado River seem to define the very bottom of the world, though the name “Colorado” derives from what once was the river’s warm, rust-red flow. With binoculars you can make out a green fringe of tamarisk trees along one bank.

Unkar Creek shows there too. It has ferried its cargo of silt and rock off the North Rim and down to the river over unknown millennia, whenever the rains come. The result, a rounded delta, has pushed a wide bend into the Colorado, and added some fine rapids. Humans have farmed that little fan of dirt off and on for perhaps ten thousand years.

Tree-ring data show that the climate, which dictates the flows of the creek, has varied widely over time and directs the presence or absence of constellations of plants, animals, and ancestral humans. Just now Canyon life unfolds within the most severe drought the region has seen since the 1500s. It is reckoned by scientists to be either a signal of human-driven climate change or a mild preview of what it will be like.

The frigid clarity of the once warm and silty Colorado, new since the advent of the Glen Canyon Dam upstream, has all but extinguished native fish species. The prolific tamarisk trees, arrivistes from central Asia, have severely disrupted native plant and animal communities along the river’s banks. Then there’s the dirty haze from smokestacks and tailpipes, and the hybrid beefalo herd that is overgrazing and erod-

ing fragile rangeland, where such animals (even native buffalo) have never roamed. All are evidence of lapses in our stewardship of this globally revered sanctuary. So is the ceaseless staccato of the air-tour choppers, and the fact that the condors are still being poisoned.

As we head into its second century, few would disagree that we want the park system to fulfill its mandate to preserve nature. “The core element of the national parks is that they are in the perpetuity business,” as Gary Machlis, science adviser to the director of the Park Service, told me. “The irony is that our mission is to preserve things in perpetuity, and we do it on an annual budget and a four-year presidential cycle.” The natural systems of the parks, he said, represent an island of stability—as long as we protect them and plan well for their future.

As it happens, the view from here on a South Rim rock also takes in other national treasures. To the north and south are the 2,500 square miles of the Kaibab National Forest, contiguous with the park. Off to the east is the 400-square-mile Vermilion Cliffs National Monument, even more remote and far less frequently visited. They are all of a piece with hundreds of thousands of square miles of other national parks, forests, deserts, grasslands, and wildlife refuges.

Conservation is a major part of the official purpose of those other public lands, at least on paper. We’ve come to recognize, little by little, that they are part of the foundations of our own survival. They could prove to be an ark for what’s left of our natural heritage—one that may remain buoyant, if we’re supremely vigilant and profoundly lucky.

From a high orbit the Grand Canyon resembles an exquisitely detailed origami. To guess its future well, we have to unfold it outward into full context and see the entire portfolio of public lands that surround it. We’ve carved up the landscape administratively among the Park Service, the Forest Service, the Bureau of Land Management, the Fish and Wildlife Service, and several other agencies, and we oversee it with greater and lesser levels of protection. Within the horizons of the South Rim, though, you can feel its unity—something like the blanket of muscle strands, blood paths, and neural nets that make up your own

body. What remains of their integration has become indispensable to the biological survival of these lands as a whole—more so today than before the Europeans, or the Paiutes, or their predecessor humans arrived.

Federal public lands total more than a million square miles—28 percent of the national dirt. Outside of the national parks, most of us pay those expanses of rock, range and forest little heed, but they're the source of billions in annual federal revenue and easily the nation's single most valuable hard asset. It affords us hiking, hunting, fishing, wildlife habitat, flood and erosion control, and a buffer against climate change, as well as timber, mineral, and oil, coal, and gas deposits. Twenty percent of our clean water is provided by federal forests and grasslands.

Interesting, then, that the U.S. House of Representatives voted to value federal lands as worthless, as the Donald Trump administration took office. This eases their transfer into state or private hands without compensation to the nation. Once begun, each step in that process would be irreversible. A national hunters' and anglers' group responded: "... the concept of public lands was born of a desire to remove the shackles of a stifling European system in which only the wealthy or royalty could enjoy the outdoors. We the people own these mountains and forests, rivers and plains. Nothing could be more American." The president then ordered a "review" of established protections for about 20,000 square miles of federal lands, calling them "an abuse." That move spikes the odds for more mines, wells, and commercial development—and far less protection for natural areas.

So public lands are up for grabs. Recent events—fire and insurrection, for example—have brought them sporadically to media attention. They have led Sean Hannity of Fox News to the rhetorical question, "By the way—why do they [the feds] own all that land?" The online hipster news source *VICE* brings a different sensibility but the same question when it tries to delve into the strange novelty of it all, that "the federal government owns the majority of the land in eleven western states, which is, to be fair, a shit-ton of land." Our political and legal history explains how this came to be, but not why it should continue.

The most compelling answer to that question is outside both history and politics, and Grand Canyon is a fine place to begin looking for it.

I've talked with dozens of people who have skin in that continent-sized game, the management of public lands for which Americans hold the deeds of trust. As we now contemplate the disintegration of this estate, it's useful to hear from scientists, administrators, ranchers and developers, environmentalists, and power-plant operators. Through them, we can hope to see more clearly the condition of the land itself, and especially the natural systems it supports. We want to know, don't we, whether we're getting ripped off?

President Theodore Roosevelt, sometimes clairvoyant, advised an admiring crowd on these matters during a May afternoon in 1903. He had decided to visit the national preserve that his leadership would almost single-handedly create in the face of bitter local political opposition. Roosevelt said, "What you can do is to keep it for your children, your children's children, and for all who come after you, as one of the great sights which every American if he can travel at all should see." He implored us (which could not have been easy, given his disposition), "to do one thing in connection with it in your own interest and in the interest of the country, to keep this great wonder of nature as it now is. . . . I hope that you will not . . . mar the wonderful grandeur, the sublimity, the great loneliness and beauty of the Canyon. Leave it as it is. You can not improve on it. The ages have been at work on it, and man can only mar it."

A few years later Congress passed the Organic Act of 1916, which established the National Park Service and defined its mission: "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Legal scholars have richly documented the subsequent history of the act and its vaguely contradictory instructions. Were the parks going to be more or less a collective Teddy Roosevelt wilderness or Central Park,

or something in between? Was the original intent to emphasize “enjoyment” by U.S. citizens? That calls to mind some comfortable sightseeing or a well-ordered recreational setting and “pleasuring ground,” to use a phrase of those times. The “enjoyment” must not harm the nature of the parks, the act states, but the word does appear there twice, after all.

Or should we focus instead on the sinew, the rarest quality of what the writer Wallace Stegner (or Lord James Bryce, or someone) first called “America’s best idea?” That obligation is “to conserve . . . unimpaired” the living organisms, the wildlife, the scenery.

The conflict between the two motives is sharpest right there at the word “unimpaired.” We’ve been deciding what that really means all during the century since the Park Service was founded, and we will continue to. Original intent and original equivocations aside, this is political history as much as law. It follows the pragmatism of the great Supreme Court justice of that era, Oliver Wendell Holmes, who once wrote that “the secret root from which the law draws all the juices of life” is in reality “considerations of what is expedient for the community concerned.”

Despite the power of precedent and the illusion of stability conferred by legal language, in other words, the meaning of a law adapts to society’s priorities over time. The Organic Act made its promise about leaving nature and wildlife unimpaired. Grand Canyon and the rest of the national park system give abundant evidence of where the promise has been kept, and broken, in the century since then.

When the Park Service drew up an ambitious post-World War II development agenda called Mission 66, it pushed for more roads, more building construction, and more commercial infrastructure for the national parks, all to increase the numbers of tourists and the comforts of their travel. That dominant idea had to make some room for a competing urgency that first arose during the 1970s, however.

A national environmental consciousness was taking root, along with a new federal framework for environmental protection—the National Environmental Quality Act, the Clean Air and Clean Water Acts, and the Environmental Protection Agency. By then the parks’ natural systems had

already become visibly fragile, increasingly degraded. A new program of science research was launched to assess their condition and prognosis.

These days Grand Canyon scientists transform the acres of spreadsheet data they collect—about bighorn sheep habitat, let's say, or the distribution of cactus species or summer rainfall—into visualizations that are often like sets of maps. These are far better adapted to human comprehension, just as a roadmap is much easier to figure out than a string of numbers that might be used to describe a route.

Decks of these data pictures, or infographics, can be superimposed, one on another. You could see how a certain bird or insect species occurs more frequently at higher elevations, amid particular kinds of vegetation, in specific winter temperature ranges, or near springs and seeps. The science that underlies these sometimes strikingly beautiful graphics can unlock puzzles about how we should manage the land.

There are no resource-management overlays, though, that incorporate some other powerful but less tangible factors that can dominate natural systems. We need to, but cannot, map out the distribution of human political power within a natural setting, how it operates to extend the life chances of certain fish species or the amount of pollution in Canyon air and water. You can't easily visualize the flow of money that enables environmental decay in Arizona. It would be difficult to contrive an overlay to show whether scientific recommendations for managing endangered species are followed, fudged, or dismissed out of hand because of pressure from lobbyists or commercial interests or from a kind of willed ignorance that rejects science.

Too bad, because those influences matter deeply in any realistic picture of the Grand Canyon region's future, that of Great Smoky Mountains National Park, Alaska's Tongass National Forest, or any other federal lands. Instead of a fine set of maps and overlays, we will have to portray political factors by other means.

It's getting chilly out here as the sunset fades. It is fleeing west, past Las Vegas, which for now at least is safely on the far edge of dusk. And I'm

thinking, all well and good about how public lands are imperiled, but come on: *Grand Canyon for Sale*. Is that preposterous? “Grand Canyon will always be there!” an acquaintance out east, where I live, recently assured me. I knew exactly what he meant. I’ve been offered the same warrant by many others, including a top administrator in the Park Service. But in an all-important sense, they and their catchphrase are mistaken.

Grand Canyon comes to mind first as its defining image: a nearly eternal horizon of pillars and walls. A sunken cathedral of rock. All that part of the scenery will indeed, within casual calculation anyway, always be there. But despite the barrenness that a calendar photo may suggest, the park supports a diverse, fragile living realm. That’s because it is protected, of course, and because its six thousand feet of abrupt descent yields a broad range of natural communities. Boreal forest on the high North Rim that is more characteristic of Canada transitions down through several life zones to low, scorching desert similar to that of Mexico, at the level of the Colorado.

This jumblestack of habitats shelters 91 mammal species—bears, rodents, bighorn sheep, coyotes, ringtail cats, skunks, raccoons, bobcats, foxes, and cougars among them—57 different reptiles and amphibians, 373 birds, 8,480 kinds of insects, and 17 fish. Twenty-five plant and animal species are formally recognized as extinct, extirpated (gone from the Canyon), endangered, threatened, or “species of concern” for some other reason, and the list is no doubt incomplete.

Frontline, longtime conservation campaigners inside and outside the government can be impatient with bright ideas about the work of protecting that heritage. They’ve heard them before, and, really, they might easily conclude, so what? They don’t have time to indulge thumbsucker fantasies about best-case scenarios. They have to fight hard for what can really be accomplished, given the hand they’ve been dealt. After all, much of the nation thinks the federal budget is busted. And even if you’ve concluded that that’s a hysterical hoax, our current polit-



ical landscape is gridlocked at nearly every intersection. Who's going to step up for a panoramic fight over public lands?

That's an easy call, in a way—a process of elimination. Government officials we've hired to protect public lands show memorable courage at times, but they are also obliged to be loyal to their chain of command. We can't ask them to “die on every hill,” in the constant battles they face against economic and political interests with priorities other than conservation.

So federal administrators can really be only as brave and good as we allow them to be. Absent reliable and highly visible public support they give ground, and compromise, and as time passes our civic inattention—the fond, false hope that someone else is minding the store—accelerates the hazard to the whole public landscape. What if the store is steadily pilfered or has caught fire? Environmental groups, too, have to work largely within the circumscribed options of politics, the “art of the possible,” that we Americans create for them.

The reason to take a look at the current state of the Grand Canyon—the foreground example for this book—and our other parks and public lands is not to pretend that more new ideas are all we need. It's to see what needs to be done. “There is this constituency that's uninformed, that takes their national parks for granted, that they'll always be there and they will always be cool, and they just don't really know how threatened they are,” as former Grand Canyon superintendent David Uberuaga told me. “They don't realize how powerful their voices are with their congressional delegation and that there's a need to be raising hell.”

The centenary of the Park Service has just passed, along with some well-deserved national self-congratulations. Perhaps this would be a discreet time to say that the parks' natural systems are, in the estimation of many scientists, falling apart. In that view all public lands need long-term life support, beginning as soon as we can pull it together. We're on a precipice, both politically and biologically. It's a good time

to visit those scientists and their research, and take a look around before deciding our next moves.

My working theory is that if you look hard enough, you can measure whether we've lost far too much ground over the years in that well-rehearsed, real-world pragmatism of political compromise. It may be as if we're running up an escalator, and we can see progress if we focus on each step. But we have to look around, instead, to see if the reality is that we're moving backward and down.

If you're a reader like me, you're wondering by now what my agenda is—as in, political agenda. Here are my biases, then: I'm part of a small-business-oriented family, I'm a journalist, and I teach. I have strong faith in the historical, productive ingenuity of a market economy. I have also drawn continual inspiration from the commitment, wisdom, and tireless labor of scientists and administrators in public service whom I've met over the last thirty years of writing about their work.

As it happens, though, that work unfolds within an electoral system that can foster astounding waste and self-dealing. Indeed, the only source of disappointment in public life that rivals government sometimes is the blind rapacity of unregulated free enterprise. We can vote out misbehavers in government, at least—except when the electoral system itself is nearly owned outright by just a few.

Naturally, I wonder what's on your mind too. My assumptions are that you may or may not know much about them, but you have a firm enough attachment to the United States' national parks, forests, monuments, wildlife refuges, and other public lands, and the natural life within them, to read about their future.

That's my concern too. An incisive painting by the artist Robert McCauley shows a big stoic brown bear, standing erect and ready to speak behind a cluster of press-conference microphones. If only it could! For now and ever, though, we humans have to see how nature fares, and speak on its behalf.

If you question any of the fact-assertions in these pages—and you really should—their sources are usually evident in the text. If not,

please consult the detailed endnotes. Some of what's here may strike you as quarrelsome or overconciliatory, but it isn't fiction.

I guess it might instead be offered as a secular prayer—for the salvation of Grand Canyon, the national parks, and the much wider public-lands legacy. Long ago I attended a family dinner at which the patriarch gave this invocation: “Dear Lord, help us figure it out.” That's all we really have, to start with. And in that spirit of both humility and hubris, let us carry the inquiry forward (see Map 2).