

## What Should NPS Tell Visitors (and Congress) about Climate Change?

*Philip Cafaro*

### What we are doing

ANTHROPOGENIC CLIMATE CHANGE IS ALREADY DEGRADING AMERICA'S NATIONAL PARKS AND other protected areas, in the US and around the world. And the prognosis under "business as usual" demographic, economic, and energy policies is for their continued decline.<sup>1</sup>

Item: Glacier National Park is losing its glaciers; the last one may melt away by 2030. Loss of glacial run-off and reduced snowpacks will decrease stream flows, possibly driving native bull trout extinct. Iconic wildlife species such as grizzly bears, wolverines, and mountain goats are likely to decline due to dryer, warmer conditions.

Item: Rocky Mountain National Park and surrounding wilderness areas contain hundreds of thousands of acres of dead or dying pine forests. As the National Park Service (NPS) Climate Change Response Program website explains: "Pine beetles are natural to this system, but normally the harsh Colorado winters are cold enough to kill off many of these beetles. However with warming winter temperatures it has allowed the beetle population to explode, causing the devastation of lodgepole pine trees in the park." In addition, like Glacier, Rocky Mountain could lose rare wildflower species as alpine habitats shrink or are degraded.

Item: Joshua Tree National Park may lose all its Joshua trees within this century. The trees are dying in enormous numbers due to a drought more severe than any experienced during the past five hundred years.

Item: In Everglades National Park, climate change-induced sea level rises of only a few meters threaten to submerge large areas of the park, including most current mangrove stands:

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*The George Wright Forum*, vol. 29, no. 3, pp. 287–298 (2012).

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key nurseries for ocean fishes. Wading bird populations, already greatly decreased since the park's establishment in 1947, due to excessive water withdrawals, will decline even further due to habitat loss. Coral reefs at nearby Biscayne National Park will probably be lost due to higher temperatures and ocean acidification. American alligators, at the southern edge of their distribution, may disappear from Everglades, like pika from Rocky and harlequin ducks from Glacier.

So that is what we are doing. We are degrading our national parks and other natural areas: pushing them far outside natural climatic and ecological parameters, and ensuring that future generations will find their native flora and fauna significantly depleted, compared with the parks we ourselves have known.

*How* are we doing this? The primary causes of climate change are no mystery: rapid, unremitting economic and demographic growth. As the *Fourth Assessment Report* from the Intergovernmental Panel on Climate Change (IPCC) succinctly put it: “GDP/per capita and population growth were the main drivers of the increase in global emissions during the last three decades of the 20th century. . . . At the global scale, declining carbon and energy intensities [i.e., increased efficiency] have been unable to offset income effects and population growth and, consequently, carbon emissions have risen.”<sup>2</sup> With rising carbon emissions (and deforestation and other land use changes, also driven by growth) have come climate destabilization.

Crucially, the IPCC's projections for the next several decades see a continuation of these trends; more people living more affluently mean that under “business as usual,” despite expected technical efficiency improvements, greenhouse gas emissions will increase between 25% and 90% by 2030, relative to 2000.<sup>3</sup> If humanity continues along this path, which we give every indication of doing, we will almost surely lock in global temperature increases of more than two degrees Centigrade over pre-industrial levels, perhaps much more, further degrading national parks and protected areas. According to the *Fourth Assessment Report*, climate change combined with other growth-induced stressors could extinguish one-quarter or more of the world's species by 2100, including many rare or threatened species currently hanging on in national parks.

One hundred years ago, fifty years ago, perhaps even twenty-five years ago, educated people might well have pled ignorance regarding the full ecological effects of that growth for which our political and business leaders endlessly bray. But after the work of the IPCC, the authors of the 2005 *Millennium Ecosystem Assessment*, and others, the age of ecological innocence is over. We now know that the continued growth of humanity displaces other species and degrades the entire planetary ecosystem, even areas previously protected by their remoteness. Henceforth our growth is synonymous with the decline of wild nature.<sup>4</sup>

### **What NPS should say about what we are doing**

I propose that NPS tell its visitors the truth about this—all of it, not just the parts that visitors feel comfortable hearing, or that park interpreters feel comfortable saying. We owe it to the parks to do so. We owe it to the pikas and grizzly bears, the Joshua trees and Parry's primroses, to do so. *Not* doing so conflicts with the “fundamental purpose” of NPS, as stated in the 1916 Organic Act, since it is clear that anthropogenic climate change is “impairing” the

parks and undermining efforts “to conserve the scenery and the natural and historic objects and the wild life therein.”

Where climate change is harming the parks, NPS should say so. Where plausible scenarios show that further climate change is likely to damage them even more, NPS should vividly convey that. Most important, but perhaps also most difficult: NPS should explain to the American people plainly that growth—ever more people, consuming and producing ever more goods and services, living ever more luxuriously—is driving the climate change that is degrading their national parks. We owe American citizens this honesty, because ultimately, it is their responsibility to behave in ways that preserve the parks, just as it is their government’s responsibility to pursue policies that preserve them.

Here we confront the serious problem that climate change is typically treated as a technical or managerial problem that can be solved by increased efficiency (hybrid cars, compact fluorescent bulbs, etc.) and not as evidence that humanity is bumping up against ecological limits.<sup>5</sup> There is no public consensus, even among those who care about wild nature, that we have to choose between pursuing further growth, on the one hand, and preserving protected areas and leaving some non-degraded habitat and resources for other species, on the other.

Nevertheless, the science strongly suggests that we do face such a choice.<sup>6</sup> Even if continued growth could conceivably be squared with limiting climate change enough to protect the national parks, in the face of the *actual* harms caused by growth, the burden of proof should be on those claiming such *potential* benignity. NPS should not carry water for them, even inadvertently.

Readers of Thomas Friedman’s techno-optimist best-sellers (*The World is Flat; Hot, Flat, and Crowded*, etc.) lap his stuff up because it makes them feel good. Everyone can get rich as the world becomes “more green”: eat cake and lose weight. Meanwhile, back in the real world, according to the US Department of Energy, “economic growth is the most significant factor underlying the projections for growth in energy-related carbon dioxide emissions in the mid-term, as the world continues to rely on fossil fuels for most of its energy use.”<sup>7</sup> Meanwhile, back on the round sphere with a finite surface area called Earth, according to the IPCC, economic growth and population growth are driving climate change. That is what NPS should tell visitors to the national parks.

### **What NPS is saying about what we are doing**

When we look at what NPS actually tells visitors about climate change, we find a mixed bag. NPS has developed some good materials explaining the harms climate change is causing or may cause particular parks. At its best, this material forthrightly states that climate change will damage the parks or the wildlife within them. For example, the website for Point Reyes National Seashore tells visitors:

Due to global warming, Point Reyes and other national parks are currently confronting one of the greatest threats in their history. The world is heating up, and the signs are already visible in National Parks: rising temperatures, prolonged drought, severe wildfires, diminished snowfall, acidifying oceans, and changing habitats. . . .

Rising sea levels impelled by melting glaciers and polar icecaps will likely dramatically change this coastal park's environment upon which animals have come to rely and humans come to enjoy. The U.S. Geological Survey (USGS) predicts that rising seas could erode beaches and coastlines, submerge wetlands, and swallow up Native American cultural artifacts at Point Reyes and several other national parks. Rising temperatures may make this area uninhabitable for many species of plants and animals that currently live here. . . .

At other times, though, the language NPS uses seems limp, given the magnitude of the threats, or euphemistic. "Climate change transforms the natural and cultural landscapes of national parks and impacts your national park adventure," states the Climate Change Response Program's homepage, and clicking on "Consequences" brings one to a long, diffuse discussion of how climate change will "change" the parks:

As the climate drivers *change*, the natural ecosystem and human use of that landscape are bound to *change*. Even subtle shifts in climate can create substantial *changes*—earlier snowmelt, a slight increase in summer temperatures, and a slight decrease in rainfall can combine to *change* the intensity of forest fires, or render forests more susceptible to pests and diseases. With climate *change*, nature will begin to *rearrange* itself, and our ability to protect and manage national parks will be challenged . . . (emphases added).

But "change" and "transformation" are not necessarily bad things, nor is "nature rearranging itself" in response to changed conditions, nor are people "being challenged" in response to those changes. This passage and a previous section on climate change "drivers" also undermine any sense of *agency* for these "changes," making it seem like they are just happening.

Now imagine rewriting this passage to emphasize the harms of climate change and our responsibility for those harms. It might read something like this:

As populations increase and people consume more, burning more fossil fuels and generating more pollution, natural ecosystems such as those of the national parks are stressed and pushed beyond historical ecological parameters. Even subtle shifts in climate can degrade habitat that is essential for rare and endangered species, driving them to extinction, or dry out forests, killing them and displacing their inhabitants. Climate change is already harming the parks in these ways and threatens to further degrade them in the future, unless we act to prevent it. Future generations will not be able to fix this damage. . . .

I contend that the second passage is not just more vivid, but more accurate. It better captures what the scientists tell us is happening and could happen to the national parks, and why. It suggests a more forthright ethical accounting of our responsibilities regarding this looming disaster.

In general, strong, direct, clear statements seem preferable when speaking about all this. "Losing a Legacy: A Photographic Story of Disappearing Glaciers" is a good headline for a USGS project documenting climate change impacts in Glacier National Park. "Glacier's

Changing Landscape” is a bad headline for a section of the park visitor guide dealing with the same topic.<sup>8</sup>

The best interpretative materials on climate change tend to be the most vivid. Particularly powerful, it seems to me, are wayside exhibits, based on prototypes developed at Golden Gate National Recreation Area (Figure 1), currently being planned for eight to ten coastal parks. These will show visitors contour lines of potential future sea levels, vividly portraying how sections of these parks and adjacent landscapes could be under water if climate change continues unabated. This is sort of a limit case: because the potential loss is so obvious and complete, these exhibits will hardly have to explain why these effects would be bad (although they can amplify the message; for example, by having a map which shows how much of the surrounding area would be under water with particular sea level rises).

These exhibits show the power of the concrete and particular, in driving home the costs, to the parks, of climate change. They suggest that efforts to interpret subtler impacts might benefit from making them more concrete. For example, at the end of a wildflower identification walk in Rocky Mountain National Park, an interpreter might ask young people to imagine coming back to the park with their grandchildren in 50 years, describing what fairy primroses or alpine forget-me-nots looked like, and explaining to them why those species are no longer there.

**Figure 1.** Sea level rise exhibits at Golden Gate National Recreation Area, San Francisco. (Left): Exhibit at Crissy Field with gauge marking future sea levels with colored balls. (Right): Detail of exhibit panel on Alcatraz Island.



Above all, NPS should avoid normalizing the losses expected from climate change. Currently, a list of frequently asked questions ploddingly explains that Glacier National Park will keep its name after its last glacier disappears. Why not instead solicit visitors' suggestions for renaming "the National Park formerly known as Glacier," or "Joshua Tree-Free National Park"? Such exercises might help visitors understand how radically we are changing the parks, and spur some of them to consider what it would actually take to protect them.

When it comes to discussing the *causes* of global warming, NPS interpretive materials again appear to be a mixed bag. On the positive side, these materials insist that "global warming is real," to quote again from the NPS Climate Change Response Program website, and emphasize that climate change is anthropogenic. Rising greenhouse gas emissions, driven by increased fossil fuel use, are clearly identified as the leading cause of global climate change in many NPS publications. In our current political context, with one major political party in the grip of climate change denial, NPS deserves credit for this forthright defense of reality.

On the negative side, nowhere in any NPS publication have I found a clear restatement of the IPCC's conclusion that growth in human numbers, wealth, and economic activity are the fundamental drivers of rising greenhouse gas emissions and attendant climate change. And when we turn to the "what you can do to help" sections of several NPS climate change websites and publications, the focus is on individual, voluntary actions, rather than policy changes or mandatory, society-wide improvements. In one representative discussion, concerned individuals are told that they can "walk, carpool, bike or use public transportation if possible," replace incandescent bulbs, use recycled products, "purchase a travel coffee mug and a reusable water bottle to reduce use of disposable products," and carry reusable bags, among a laundry list of possibilities.<sup>9</sup>

This non-threatening approach makes some sense when reaching out to individuals with diverse political leanings. It is hard to imagine NPS proposing that visitors "drive less, replace incandescent bulbs with compact fluorescents, demand that politicians pass strong climate change legislation that taxes carbon emissions, and vote them out of office if they do not." Still, when interpretive materials combine silence regarding the underlying forces driving climate change with easy, voluntary suggestions for emissions cuts, they reinforce the notion that such efforts are sufficient to deal with climate change. And that is seriously misleading.

As things stand, then, NPS interpretive materials do a decent job of teaching visitors that climate change is real and that it is a serious problem threatening their parks, while doing a poor job of explaining its causes and potential solutions to the problem.

### **How to improve what NPS says about what we are doing**

One way to build on these efforts would be to drop the weak parts. If NPS personnel feel squeamish talking about the real causes and adequate solutions for mitigating climate change, then they should at least avoid giving incomplete explanations or promoting inadequate solutions which mislead visitors. Instead, NPS interpreters could focus on what they care most about: the well-being of the national parks. Talk about how we are harming the parks and leave contentious discussions regarding causes and solutions to those who are willing to confront their fellow citizens with hard truths. Even politically conservative park

visitors typically care about the parks, so this approach might provide a window to get them thinking more seriously about climate change.

The other way to build on current efforts would be to take a deep breath and talk more honestly about the causes of climate change. After all, melting glaciers, dead forests and rising shorelines provide potentially powerful “teachable moments” for visitors. Some NPS personnel would probably welcome the opportunity to look beyond the “hundred cuts” afflicting the parks and speak candidly about what really ails them: too many people making too many demands on nature. If any settings could put visitors in a receptive mood, willing to consider the downside of growth or the possibility of sacrificing some unnecessary consumption in exchange for preserving wild nature, it might be the national parks.

Getting the general public to think about limits to growth will be difficult, no doubt. But I believe it is also essential to preserving the national parks over the long term. It is a shame the big environmental groups have largely abandoned talk about ecological limits. Perhaps an honest discussion of what further growth means for the national parks can help revive this topic, reinvigorating these timid giants in the process.

As for directly promoting the necessary *solutions* to climate change, however, my suggestion would be for NPS to simply let those alone. “101 easy suggestions for mitigating climate change” is just that—too easy. But the real solutions needed are too controversial for advocacy by the personnel of a non-political government agency, at least without the “cover” provided by an honest discussion of these matters by environmental groups and mainstream politicians. Reining in population growth in the United States will have to involve reducing immigration and maintaining the legal availability of abortion, a one-two punch guaranteed to alienate people across the political spectrum.<sup>10</sup> Reining in economic growth will demand nothing less than an economic revolution, given our current economy built on the premise of endless growth.

In order to protect our national parks and create sustainable societies, we must move from a political system and an economy which seek to supply ever more people with ever more stuff, to a political economy which provides a limited number of people with a sufficiency. What that will look like, in detail, remains to be seen.<sup>11</sup> Probably the best NPS can contribute to clarifying such questions is to raise the alarm about what we are doing to our parks, while avoiding the usual “happy talk” that only obscures what needs to be done to protect them.

### **National parks cannot adapt to climate change**

Speaking of clearing out the rubbish, NPS should drop all talk about helping national parks “adapt” to climate change. According to the NPS Climate Change Response Program: “The National Park Service can improve the long-term health of national parks by making natural, cultural, and social systems better able to withstand and recover from climate changes through adaptation.” According to NPS’s official *Climate Change Response Strategy*, NPS seeks to “implement adaptation strategies that promote ecosystem resilience . . . and support the ability of natural systems and species to adapt to change.” “By focusing on resilience,” its authors claim, park managers can “accommodate and respond to emerging knowledge of cli-

mate change effects and alternative management strategies that can lessen the impacts” of climate change.<sup>12</sup>

This is simply whistling in the dark. NPS cannot refreeze glaciers. It cannot replant millions of acres of degraded forests. It cannot bring back species extinguished by climate change. Attempts to protect what the parks are losing are bound to fail, in the long run. Suggesting otherwise just provides cover for those whose actions and policies are degrading our national parks.

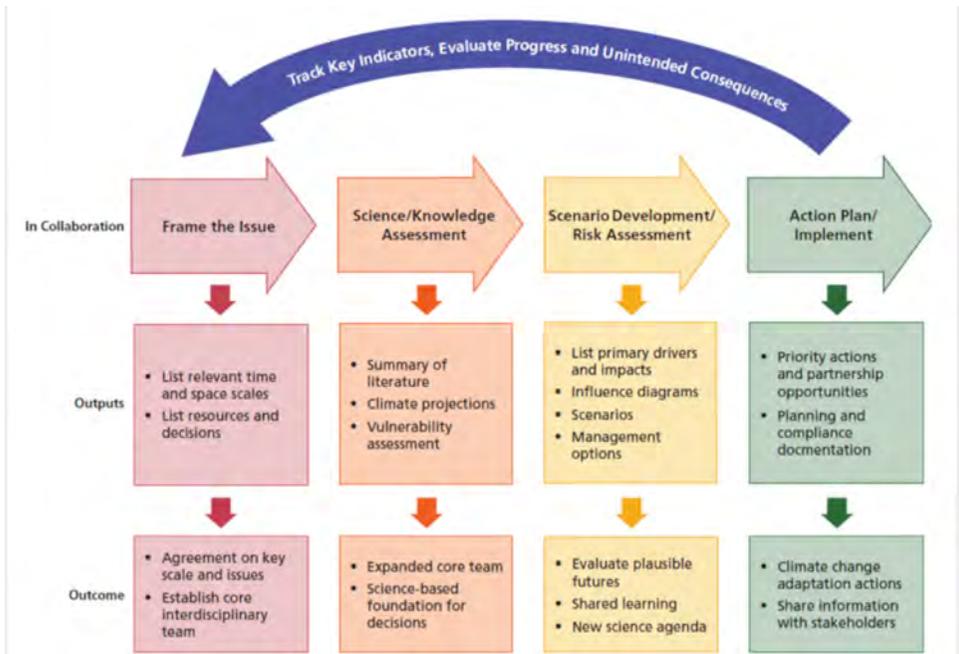
In addition, intensive manipulation of national park landscapes or wildlife populations will inevitably turn them into something less than national parks: botanical gardens or zoos, rather than genuine holdfasts for wild nature. As the National Park System Advisory Board science committee recently reminded us, the NPS mission includes “preserving [the] ecological integrity” of the lands entrusted to its care. That means maintaining what nature, not a resource manager, creates within the parks, including “complete food webs, a full complement of native animal and plant species maintaining their populations, and naturally functioning ecological processes.”<sup>13</sup> If achieving this is impossible in the warming, destabilized, ecologically degraded world we are creating with our excessive numbers and demands on nature, then NPS should say so.

But a “can-do,” managerial stance is popular among land managers, and probably selected for among those competing for leadership roles in large bureaucracies. Just as mainstream economists cannot accept limits to growth, and assume, against the preponderance of evidence, that efficiency improvements can sufficiently mitigate climate change, so managers seem to have a hard time accepting that better management, by itself, cannot save wild lands (Figure 2). Here is NPS Director Jon Jarvis, testifying in 2009 before the Senate Subcommittee on National Parks, at a hearing devoted to climate change:

For adaptation planning and implementation, our highest priority is to support the ability of species, communities, and ecosystems to respond to changing conditions. For example, changes in weather patterns, water availability, and wildland fire will stimulate changes in the distribution and abundance of plants, animals, and ecological communities through both adaptation and migration. NPS actions to build resilience and reduce other ecosystem stressors, especially the effects of exotic species, will help to reduce the extent or intensity of some of the most deleterious impacts on park resources from climate change. . . .<sup>14</sup>

Big words—but essentially empty ones. NPS efforts to cull exotic species, transplant natives, or buffer waters or soils that are departing from historical conditions are well-intentioned. In some instances, they may do some short-term good. But as long-term strategies, such efforts are hopeless: unlikely to achieve their stated goals, even as they ensure that park landscapes become ever more humanized, losing their wild integrity.

In jumping on the adaptation bandwagon, NPS has followed the lead of the climate change policymaking community. But while adapting to climate change already “in the pipeline” makes sense for human societies, it is not possible for natural ecosystems that we want to remain natural.<sup>15</sup> If Director Jarvis wanted to speak a good word for nature in his congressional testimony, he would have been better served by something like the following:



**Figure 2.** "Conceptual Approach for Collaborative Adaptation Planning." Note the inclusion of many favored aspects of "adaptive management," such as collaboration, action at appropriate scales, prioritizing goals, etc. This jargon enhances the comforting illusion that better management will help protect the national parks from climate change. Source: National Park Service, *Climate Change Response Strategy* (Fort Collins, CO: NPS Climate Change Response Program, 2010).

I and the dedicated professionals of the National Park Service would love to manage the parks in ways that keep them safe from the worst harms of global climate change. But we can't. We need Congress and the American people to help protect the national parks by managing our excessive and growing energy use. A world in full adaptation mode to climate change (perhaps with planet-wide geo-engineering to keep 'ecosystem services' available to humans) will be a world that has degraded and altered national parks beyond recognition. In order to preserve our national parks, we must limit climate change, by working harder at managing *ourselves*.

Such a statement might have helped build the case for strong action to fight climate change (a decent climate change bill died in the Senate the following year). Talk about adaptation instead lulls listeners into believing that we can continue with "business as usual" and still protect our parks.

**Your mission, should you choose to accept it**

The "fundamental purpose" of NPS is "to conserve the scenery and the natural and historic objects and the wild life [within the national parks] 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.” Over the past hundred years, as NPS has struggled to understand and uphold its mission, three aspects of this fundamental purpose have been clarified that deserve emphasis as we consider this essay’s guiding question: what should NPS say about climate change?

First, NPS’s purpose includes preserving *all* species native to the parks—not just those we like or which can coexist with particular human behaviors. Second, it involves limiting or prohibiting activities within the parks that harm them—even popular ones. Third, over time, Park Service leaders have found that they must weigh in on activities *outside* the parks when they threaten the parks themselves—despite the backlash such efforts are bound to provoke.<sup>16</sup>

This generous vision remains compelling. In a crowded, warming world, where human beings threaten to overwhelm nature, it is needed more than ever. But applying this vision to the issue of climate change does not mean accepting changes emanating from beyond the parks’ boundaries that threaten to destroy them, or pretending that such changes can be “managed.” Instead it means ringing out an unambiguous warning aimed at all those who care enough about the national parks to fight on their behalf.

The National Park Service was originally a product of Progressive Era conservation, which included preservation of wild nature and economic growth as goals, and assumed that both could be achieved indefinitely, if resources were managed rationally and efficiently. Whatever the merits of such a philosophy in 1916, it is patently unsuited to 2016. National parks in the US and around the world cannot survive intact another century of human demographic and economic growth. It is time for those committed to preserving the parks and biodiversity generally, including NPS managers, to acknowledge this and act accordingly.

NPS should tell visitors the truth: that growing human numbers and economic activity are damaging their national parks and other wild lands, through climate change and other mechanisms; that we are on course to leave our grandchildren a severely degraded and significantly depauperate national park system; and that unless we change course, we may largely destroy some of them in the future by drying them out, burning them up, or sinking them below the waves of the ocean.

We owe it to the parks and to their owners, the American people, to give them this bad news without any sugar coating. What they do with it, of course, is beyond our control.

## Acknowledgments

Thanks to the following individuals for answering questions, commenting on earlier versions of this essay, or otherwise aiding in its composition: Tracy Ammerman, Kristin Cafaro, Jerry Freilich, Angie Richman, Alan Scott, Winthrop Staples III, and Tom Stohlgren. Any mistakes, however, are solely the responsibility of the author.

## Endnotes

1. For an overview of observed and anticipated impacts of climate change on the national parks, click on “climate effects” on the website for the NPS Climate Change Response Program: [www.nps.gov/climatechange/effects.cfm](http://www.nps.gov/climatechange/effects.cfm). The following description is based

on this and the following sources: Jennie Hoffman and Eric Mielbrecht, *Unnatural Disaster: Global Warming and Our National Parks* (Washington, DC: National Parks Conservation Association, undated); Kurt Repanshek and Jennie Hoffman, *Climate Change and National Park Wildlife: A Survival Guide for a Warming World* (Washington, DC: National Parks Conservation Association, undated); National Park Service, *Understanding the Science of Climate Change: Talking Points—Impacts to Western Mountains and Forests*, Natural Resource Report NPS/NRPC/NRR—2009/090 (Washington, DC: NPS, 2009); National Park Service, *Understanding the Science of Climate Change: Talking Points—Impacts to Arid Lands*, Natural Resource Report NPS/NRPC/NRR—2010/209 (Washington, DC: NPS, 2009); National Park Service, *Potential Ecological Consequences of Climate Change in South Florida and the Everglades: 2008 Literature Synthesis*, Resource Evaluation Report SFNRC Technical Series 2009:1 (Washington, DC: NPS, 2009).

2. Intergovernmental Panel on Climate Change, *Climate Change 2007: Mitigation: Technical Summary* (Geneva: IPCC), 107.
3. *Ibid.*, 111.
4. Paul Ehrlich and Anne Ehrlich, *The Dominant Animal: Human Evolution and the Environment* (Washington, DC: Island Press, 2009); Dave Foreman, *Man Swarm and the Killing of Wildlife* (Durango, CO: Raven's Eye Press, 2011).
5. Philip Cafaro, "Beyond Business as Usual: Alternative Wedges to Avoid Catastrophic Climate Change and Create Sustainable Societies," in *The Ethics of Global Climate Change*, Denis Arnold, ed. (New York: Cambridge University Press, 2011), 192–215.
6. Jeffrey McKee, *Sparing Nature: The Conflict between Human Population Growth and Earth's Biodiversity* (Piscataway, NJ: Rutgers University Press, 2003).
7. United States Energy Information Administration, *International Energy Outlook 2009* (Washington, DC: Department of Energy, 2009), chapter one.
8. "Losing a Legacy: A Photographic Story of Disappearing Glaciers," photography exhibition, Hockaday Museum of Art, Kalispell, MT, January 29–April 10, 2009; National Park Service, "Glacier Visitor Guide," Summer 2008.
9. National Park Service, *Understanding the Science of Climate Change: Talking Points—Impacts to the Pacific Coast*, Natural Resource Report NPS/NRSS/CCRP/NRR—2012/513 (Washington, DC: NPS, 2012), 18–19.
10. Steven Camarota, *100 Million More: Projecting the Impact of Immigration on the U.S. Population, 2007–2060* (Washington, DC: Center for Immigration Studies, 2007); Progressives for Immigration Reform, "US Immigration Policy—Environmental Impact Statement," online at [www.immigrationeis.org](http://www.immigrationeis.org).
11. Interesting work exploring this question includes Herman Daly and John Cobb, *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future* (Boston: Beacon Press, 1989); Samuel Alexander (ed.), *Voluntary Simplicity: The Poetic Alternative to Consumer Culture* (Whanganui, New Zealand: Stead & Daughters, 2009); Tim Jackson, *Prosperity without Growth? The Transition to a Sustainable Economy* (Brussels: European Union Sustainable Development Commission, 2009).

12. National Park Service, *Climate Change Response Strategy* (Fort Collins, CO: NPS Climate Change Response Program, 2010), 14–15.
13. National Park Service System Advisory Board Science Committee, *Revisiting Leopold: Resource Stewardship in the National Parks* (Washington, DC: National Park System Advisory Board, 2012), 11–12.
14. Senate Subcommittee on National Parks, “Impacts of Climate Change to National Parks,” Senate Hearing 111-239, October 28, 2009 (Washington, DC: US Government Printing Office, 2010).
15. Here I part company with Richard J. Hobbs et al. (“Guiding Concepts for Park and Wilderness Stewardship in an Era of Global Environmental Change,” *Frontiers in Ecology and the Environment* 8 (2010): 483–490), who argue that “naturalness” is outmoded as an organizing goal for protected areas. Space constraints prevent me from arguing against this position in detail. Suffice it to say that I do not think that the components of “naturalness” that Hobbs et al. continue to see as valid management goals, such as “ecological integrity” or “historical fidelity,” are any more amenable to preservation through adaptation programs, nor do I believe that we can jettison “naturalness” as a goal for the parks and still “manage with humility,” as they advise. There is nothing humble about accepting human domination of the national parks.
16. For a good account of these developments see Alfred Runte, *National Parks: The American Experience*, 4th ed. (Boulder, CO: Taylor, 2010).

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