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JOHN D. LESHY*

Federal Lands in the Twenty-First Century

ABSTRACT

A destabilized climate will change everything, including federal lands policies. The nation’s large federal land base will be enlisted both in “avoiding the unmanageable”—helping control or mitigate greenhouse gas (GHG) emissions that contribute to a destabilized climate—and “managing the unavoidable”—helping adapt to climate instability that cannot be avoided. Green industry requests for access to federal lands to help control GHGs can pose challenging policy issues, such as how much to encourage the use of federal lands to control GHGs at the expense of other goals. Adapting to a destabilized climate will be even more challenging, requiring considerable investment of public funds and reconfiguring some of the federal land base. Policymakers should attempt to link mitigation and adaptation together in order to, among other things, secure a funding stream for adaptation. In the end, measures to deal with a changing climate will blur many traditional boundaries, including the one between public and private land.

I. INTRODUCTION

This article takes a broad and long look ahead at the future of the federal lands.¹ Just as the value of private real estate in the nation has undergone a wrenching reexamination since the economic meltdown began in 2008, a reexamination of the value of federal lands is timely, especially given some unprecedented challenges ahead. The fiftieth anniversary of the Natural Resources Journal, with its long history of publishing fine scholarship on federal land and resources law, furnishes a suitable occasion.

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¹. This essay is drawn from my keynote address at the 55th Annual Rocky Mountain Mineral Law Foundation Institute in San Francisco on July 23, 2009, and from earlier speeches at a public land law conference at the University of Montana in Missoula in September 2008, and at the annual dinner of the Udall Foundation in Tucson in April 2009.
The “great recession” and many other pressing matters have pushed public lands issues far off the national radar screen. Nevertheless, changes afoot will, I believe, lead to more fundamental alterations in public land policy than we can now imagine. Indeed, federal lands policies are entering a pivotal period. If we make the right decisions, these lands can, as they have in the past, provide a crucial tool to meet the challenges before us. But major changes will be required in policy, law, management, and in the very location and configuration of these lands.2

Dealing with dangers posed by a destabilized climate is the overriding task. It requires us to simultaneously address both the causes and the consequences of escalating greenhouse gas (GHG) emissions. Federal lands can be used to help control GHG emissions, and to adapt to the effects of a disrupted climate. Part II briefly describes how the federal lands base evolved. Part III outlines the climate challenge and its effects. Part IV discusses in broad terms the challenge in relation to federal lands. Part V discusses how to use the federal lands to effectively mitigate GHG emissions. Part VI discusses the role of federal lands in adaptation. Part VII describes how mitigation and adaptation must be linked. Part VIII discusses how all this will lead to realignment of some federal lands and the blurring of traditional jurisdictional lines among federal managing agencies, between federal and state governments, and between public and private lands.

II. FEDERAL LANDS: A THUMBNAIL SKETCH

In a nation where principles of capitalism, private property rights, states’ rights, and local control of land use are deeply embedded, it is a remarkable fact that our national government owns roughly one of every three acres of real estate in the country. In the western states, the proportion is often much higher.3 Our long embrace of the idea that the national government should own and manage a sizeable chunk of the American landscape is a vivid illustration of a fundamental irony in America—that


we have often called upon our government to act vigorously, all the
while we exalt private property and the free enterprise system.4

These vast federal landholdings were largely an innovation of the
Progressives, a powerful bipartisan movement that flowered from about
1890 to 1920. In a sharp break from the past, the Progressives preached
that government—and by that they meant mostly the national govern-
ment—should keep key natural resources in public ownership and man-
age them to serve the broad public interest, using innovative public-
private partnerships guided by the teachings of science.5 Indeed, their
most prominent spokesperson, Theodore Roosevelt, put natural re-
sources management at the very center of the Progressive movement.
How we manage these resources was, he said, “the fundamental prob-
lem” for, in his words, unless it was solved, “it will avail us little to solve
all others.”6

We enjoy the fruits of the Progressives’ labors every day, usually
in ways we take for granted. They launched the idea of permanently
preserving large tracts of public land in America’s world-renowned sys-
tems of national parks, forests, and wildlife refuges. They halted the
practice of giving away public resources, like fossil fuels and hydro-
power sites, and substituted it with a leasing system whereby private
interests developed these resources under the watchful eye of govern-
ment.7 Progressives had their flaws to be sure, but without them our
quality of life, especially in the American West, would be much different
and, I would argue, much diminished. That payoff in improving peo-
ple’s lives is, I believe, the principal reason the Progressives’ federal
lands policies have proven to be so enduring, stubbornly resisting occa-
ional calls for large-scale divestiture.

III. DESTABILIZING CLIMATE: EFFECTS AND CHALLENGES

Now, however, our federal lands, the nation and, indeed, the
world, face major new challenges. Theodore Roosevelt’s admonition that
human treatment of the natural endowment is a fundamental problem is
more true than ever. The biggest challenge stems from the fact that our

4. Many have noted the contradictions in Americans’ view of government. See, e.g.,
(1999); JEFF MADRICK, THE CASE FOR BIG GOVERNMENT (2009).

5. Histories of this era include SAMUEL P. HAYS, CONSERVATION AND THE GOSPEL OF
EFFICIENCY (Univ. of Pitt. Press 1999) (1959); DOUGLAS BRINKLEY, THE WILDERNESS WARRIOR:

6. President Theodore Roosevelt, Address to the Deep Waterway Convention, Mem-

nation’s policies toward federal lands, and practically everything else, have been based on the paradigm that future climate will generally be like the past. That paradigm is disintegrating.\(^8\) There is now broad consensus that mankind’s incessant emissions of GHGs are destabilizing the climate. As one wag has put it, since the dawn of the industrial age, civilization has been engaged in an ambitious project to take as much carbon as possible out of the soil and geologic beds and inject it into the atmosphere.\(^9\) The incredible success of this enterprise is demonstrated by a recent scientific report that carbon dioxide levels in the atmosphere are now higher than at any point in more than two million years.\(^10\)

Many experts believe that, if GHG emissions are not seriously curtailed, by 2050 the earth will be hotter than it has ever been since human beings evolved a few hundred thousand years ago. Think about it: Our planet’s climate could, within the life span of many adults currently alive, be outside the bounds of anything that \textit{Homo sapiens} have ever experienced. Indeed, some experts think that if GHG emissions continue to grow at current rates, the earth could, by the end of this century, be hotter than it has been in three million years.

We are also beginning to grasp that this changing climate could change everything—sea levels, ocean currents, storm severity, precipitation patterns, runoff, agricultural and forest production, habitat for flora and fauna, the occurrence of upheavals like fire, drought and flooding, disease vectors, nutrient cycling, pollination, the migration patterns of humans, animals, and plants, and so on. There will likely be a veritable cascade of multiple, interactive effects, the overall dimensions of which we cannot yet imagine.

Every few weeks, it seems, new studies provide clues about how complex these interactions can be. For example, a study not long ago suggested that dust storms may be occurring with more frequency, and they—more than higher temperatures—are substantially accelerating

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8. Studies of tree rings and other fossil records of climate patterns over the last couple of millennia suggest we have enjoyed an abnormally stable climate in the last several decades. Michael E. Mann et al., \textit{Proxy-based Reconstructions of Hemispheric and Global Surface Temperature Variations over the Past Two Millennia}, 105 Proc. Nat’l Acad. Sci. 13252 (2008). Nowhere is this more clear than with respect to the Colorado River, a vital source of water to the American Southwest, and a basin that many climate models suggest will be heavily affected by altered climate. Richard Seager et al., \textit{Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America}, 316 Sci. 1181 (2007).


snowpack melting, leading to runoff weeks earlier than expected.\textsuperscript{11} This could disrupt the water supplies of many millions of westerners.

To make matters worse, most new research suggests the effects of a destabilized climate could be much more severe than was thought likely just a few years ago.\textsuperscript{12} Indeed, many credible scientists think the earth has entered an era of relatively rapid environmental change that will result in unprecedented conditions. “It’s not just a problem for the future,” Jane Lubchenco, distinguished scientist and the administrator of the National Oceanic and Atmospheric Administration, recently pointed out, “We’re beginning to see the impact on our daily lives.”\textsuperscript{13}

If we believe, as we must, that we have an obligation to leave a worthwhile legacy to succeeding generations, we must develop forceful responses to both the causes and the consequences of climate change. Our options, as Presidential Science Advisor John Holdren has put it, are three: mitigation, adaptation, and suffering.\textsuperscript{14} To minimize the suffering, we need to mitigate and adapt. Mitigation is policy speak for limiting GHG emissions. There is a broad scientific consensus that we urgently need to do this if we are to avoid runaway, truly catastrophic climate change. We also need an adaptation strategy to deal with the consequences as well as causes of climate change, as we have already essentially committed to some climate destabilization—GHGs already injected into the atmosphere will linger for a long time before they break down. In short—in the words of a study by a group of scientific experts commissioned by the United Nations—we must try to “avoid the unmanageable and manage the unavoidable.”\textsuperscript{15}


\textsuperscript{12} A recent study using ocean sediments to calculate CO\textsubscript{2} levels over the last 20 million years showed that when CO\textsubscript{2} concentrations at current levels were sustained, the polar ice caps had melted and ocean levels were 25–40 meters higher than today. Aradhna K. Tripati et al., Coupling of CO\textsubscript{2} and Ice Sheet Stability Over Major Climate Transitions of the Last 20 Million Years, 326 SCI. 1394 (2009).

\textsuperscript{13} Anne Polansky, White House briefing on Global Climate Change Impacts Report, Wednesday, June 17, 2009, video link available at http://www.climatesciencewatch.org/index.php/csw/details/video_link_and_key_quotes_from_white_house_briefing (last visited July 22, 2010).

\textsuperscript{14} John P. Holdren, Global Climate Disruption: What Do We Know? What Should We Do? Presentation at the Kennedy School of Politics, Harvard Univ. (Nov. 6, 2007).

IV. FEDERAL LANDS AND THE CHALLENGES OF A DESTABILIZING CLIMATE

While concern about the buildup of carbon in the atmosphere dates back several decades, only recently have we begun to appreciate its implications for federal lands. About a decade ago, when I gave a speech on the broad topic of “Public Lands at the Millennium,” I did not say one word about climate change.16 I was in good company; Joseph Sax delivered a lecture on “Public Land Law in the 21st Century” to the same audience the previous year without mentioning the subject.17 Those innocent days are over. We are now coming to appreciate that a destabilizing climate will change everything, including our federal lands policies. Indeed, federal lands must and will play an important role in meeting the climate challenge.

This will hardly be the first time the nation’s public lands will be called upon to help meet national challenges. Federal lands sales helped pay off the debt the government ran up to fund the Revolutionary War. Federal lands fueled the expansion of settlement across the country through homesteading and similar land grant programs. Federal lands helped endow and establish land-grant colleges. Federal lands were crucial in constructing transcontinental railroads that stitched the nation together from sea to shining sea. Federal lands produced minerals used to pay Civil War debts and feed the emerging industrial state. Federal lands produced wood to fuel the post World War II housing boom and uranium to fuel the atomic age. Federal lands produced coal and oil in an unsuccessful drive to achieve energy independence in the wake of the oil embargo in 1973, and then again after 9/11.18 Last but scarcely least, fed-

17. See Joseph L. Sax, Perspectives Lecture: Public Land Law in the 21st Century, 45 ROCKY Mt. MIN. L. INST. 1 (1999). A few saw matters much more clearly. See George M. Woodwell, The Carbon Dioxide Question, Sci. Am., Jan. 1978, at 34–43 (“The potential hazards associated with a steady increase in the carbon dioxide content of the atmosphere will loom large in the coming decades” for “almost no aspect of national and international policy . . . can remain unaffected by the prospect of global climatic change,” as it is “a major threat to the present world order.”).
18. Public lands histories recounting such episodes include ROY ROBBINS, OUR LANDED HERITAGE (2d ed. 1976); BENJAMIN H. HIBBARD, A HISTORY OF PUBLIC LAND POLICIES (Univ. Wis. Ed. 1965) (1924); PAUL GATES, HISTORY OF PUBLIC LAND LAW DEVELOPMENT (1968); PAUL W. HIRT, A CONSPIRACY OF OPTIMISME MANAGEMENT OF THE NATIONAL FORESTS SINCE WORLD WAR TWO (1994).
eral lands have proven crucial in preserving the nation’s "crown jewels," some of our most scenic and biologically rich natural places.  

V. THE ROLE OF FEDERAL LANDS IN MITIGATING GHG EMISSIONS

Federal lands can make a major contribution to curtailing GHG emissions. Large-scale efforts to develop renewable energy sources will inevitably use federal lands, perhaps in vast amounts, because they contain solar, wind, and geothermal resources in some abundance. Many millions of federal acres have already been identified as having solar and wind energy potential, and such developments, especially generating stations using concentrated solar power, tend to make more extensive and intensive use of more lands than coal mines, oil and gas fields, and fossil-fueled power plants.

Federal lands will also play an important role in building a new national "smart grid" of electricity transmission. This grid is needed both to create a much more efficient, integrated national electricity network, and to service new renewable generating facilities—many of which will likely be sited beyond the reach of the existing grid. Furthermore, federal lands will be likely sites for projects to geologically sequester carbon if "carbon capture and storage" technology develops. Finally, federal lands will also furnish opportunities to biologically sequester carbon through rejuvenating forests and grasslands, although there is considerable un-


20. I will not discuss the role of federal lands in supplying traditional fuels. Some, like coal, are heavy contributors to GHG emissions and will need to be curtailed unless technology develops to capture these emissions. Others, like natural gas, will likely be used to help bridge the transition to a more carbon-friendly energy policy. My failure to address them is not intended to downgrade their importance, but simply to suggest that the issues related to green energy and adaptation are much more game-changing.

21. They also contain uranium deposits, which might be drawn upon if and when the domestic nuclear power industry (moribund since Three Mile Island) revives.


certainty about our ability to do so effectively and to account for it in a useful way.24

A. The New Gold Rush and Lessons from History

These so-called “green energy” projects do not just loom somewhere over the horizon—this train is moving out of the station now. In 2005, Congress called upon the Secretary of the Interior to approve, within 10 years, enough green energy projects on federal lands to generate at least 10,000 megawatts of electricity.25 A few dozen projects are now operating on federal lands26 and a new “gold rush” is developing. Several hundred applications are pending with the Bureau of Land Management (BLM) and the Forest Service to build more projects, helped along by the stimulus bill enacted into law in early 2009, which made available more than $6.5 billion for “green energy.”27

Interior Secretary Ken Salazar uses the “moon shot” analogy to characterize the focused national effort required to move to a more carbon-friendly energy policy.28 Coming into office and vowing to make Interior the “true Department of Energy,” he promptly issued an order making the use of federal lands for green energy one of the Department’s “highest priorities,”29 and created “fast track” solar energy areas on BLM lands, as well as special renewable-energy offices to speed up the processing of applications in key states.30 New energy bills now be-


ing developed in Congress also have various initiatives targeting federal lands.\textsuperscript{31}

In responding to this new gold rush, we could use a double dose of humility and history, considering how some well-intentioned policies of the past have left unhappy legacies. Nineteenth-century federal lands policies encouraged the draining of “swamplands” that we now know are ecologically valuable wetlands. All-out efforts to promote mining have left debris and impaired water quality requiring billions of dollars to clean up. Our policy of doling out lands to railroads in a checkerboard pattern left some daunting economic, ecological, and management problems we still grapple with today. Former Forest Service Chief Jack Ward Thomas, a salty sort, once groused that “the [SOB] that invented checkerboard[ed land grants] ought to be sitting in hell on coals roasting. For a very long time. . . . Let’s face it: ecological systems don’t come in squares.”\textsuperscript{32}

Even Progressive-era conservation policy, enlightened though it was for its time, operated on the basis of the “enclave theory of public land management”\textsuperscript{33}—the idea that specific lands were set aside for various interests, including conservation, without paying much attention to ecological values as a whole. Contemporary understanding of ecosystems compels a larger view and, while federal policies are changing in this regard, the pace of change is slow. History also shows that federal lands policies, once adopted, can be notoriously “sticky” and resistant to change—witness the Mining Law of 1872, which withstood the Progressive tide and still permits mining companies to extract valuable minerals from federal land for free.\textsuperscript{34}

\textbf{B. Federal Lands and Mitigation Strategies: Some Recommendations}

What can this history of federal lands policymaking teach us regarding the use of federal lands for green energy projects? One lesson, prominently on display in federal land grant-making for railroad construction, is the need to check the tendency to hand out federal lands for green energy projects willy-nilly, without much consideration of the con-


\textsuperscript{33} See Sax, supra note 17, at 1–3.

sequences for other values.\textsuperscript{35} We do not know, for example, whether other alternatives—nuclear, rooftop solar, shale gas, offshore tidal and wind projects, or others yet unimagined—will emerge to displace the need for using vast areas of federal lands for green energy projects. Constraints like water availability may limit solar energy projects in some arid areas.\textsuperscript{36} While the federal lands must gear up for a possible big green energy party, it is important to keep the possibility in mind that few will attend.\textsuperscript{37}

Yet there is also reason for concern about the opposite problem—namely, that needed development of green energy might be stymied by not in my backyard, or “NIMBY,” opposition, which can easily slide into “BANANA”—build absolutely nothing anywhere near anybody. NIMBY-ism is often used pejoratively, but it reflects a legitimate and powerful concern about the quality of life and the devotion to a place. Today, most every federal acre has friends with some political or litigating power—ranchers, hunters, anglers, hikers, and others—who have developed deep attachments to landscapes and do not hesitate to advocate for preserving the quality of life bound up in their open spaces.\textsuperscript{38}

To the extent these advocates deploy familiar litigation tools—like the National Environmental Policy Act (NEPA),\textsuperscript{39} the Endangered Species Act (ESA),\textsuperscript{40} and federal land planning and management laws\textsuperscript{41}—to slow down or stop green energy developments on federal lands, they put green energy on a collision course with these bedrock conservation laws. Congress will not find it easy to amend these laws to facilitate green energy, nor should it.\textsuperscript{42}

\textsuperscript{35} See, e.g., Richard Manning, Rewilding the West 3 (2009) (arguing that the “progressive zeal of the reformer is every bit as dangerous as the swagger of the cowboy,” for both the cowboy myth and the New Deal were “flawed by the illusion of omniscience, an illusion encouraged by the [West’s] wide open spaces”).


\textsuperscript{37} See Todd Woody, Recycling Land for Green Energy Ideas, N.Y. Times, Aug. 10, 2010 (describing proposal to site what would be one of the world’s largest solar energy complexes on private farmland contaminated by salt buildup as a result of decades of irrigation in California’s San Joaquin Valley).

\textsuperscript{38} A solar power development proposed for the California desert was stymied by environmental opposition and recently abandoned despite the state’s emphasis on renewable energy. Elisabeth Rosenthal, Disputed Solar Energy Project in California Desert Is Dropped, N.Y. Times, Sept. 19, 2009.


\textsuperscript{42} I offer a suggestion for reducing the intensity of these inevitable conflicts, see infra Part VI.
Secretary Salazar’s 2009 initiative regarding solar energy on BLM land is a step in the right direction. The national government needs to work in close cooperation with state governments and be proactive in the process for siting renewable energy projects and transmission lines, and not simply react to proposals from the private sector. Some good work has already been done by the Western Governors’ Association (WGA) and others in identifying areas of high potential for renewable energy projects and low potential for conflict with other uses and values. It may be that conflicts that do arise can best be avoided by concentrating, rather than spreading, such projects out across the public lands, and collecting into corridors transmission lines to service them wherever possible. These approaches are already required by existing law “to the extent practical.”

Also, the government ought to consider experimenting with auctioning sites for green energy facilities by competitive bidding. Despite occasional missteps, this has worked fairly well for fossil fuels onshore and offshore. The government also ought to enforce a use-it-or-lose-it principle; preventing green energy applicants from stockpiling permitted sites for speculation. Finally, because some of these green energy facilities will likely be relatively exclusive and permanent uses of federal lands, the government might experiment with different tenure provisions; for example, auctioning off some sites in time-limited permits, and others in fee simple conditional with a reverter back into public ownership once the use ends and the land is reclaimed.

While a case can be made for the government subsidizing green energy industries until technologies mature and their competitiveness with conventional fuels is established, such subsidies should not take the form of free or reduced-cost access to federal lands. The principle that every public land user should pay the public owners the fair market value of these resources is a very important one to protect, even if it is not universally followed. Subsidies for green energy should take the

47. See supra text accompanying note 34 (regarding the Mining Law of 1872’s provision of free minerals).
form of generic tax credits or other measures that leave the playing field level between public and private land. Green industry should make market-based payments—based, for example, on the value of the energy produced—to the government for its use of federal lands, just as it would to private landowners.

VI. “MANAGING THE UNAVOIDABLE”: THE ROLE OF FEDERAL LANDS IN ADAPTING TO A DESTABILIZING CLIMATE

An ambitious and aggressive agenda to use federal lands to limit GHG emissions and help us “avoid the unmanageable” makes up only half of the agenda for using federal lands to cope with the climate challenge. We must also formulate strategies for using federal lands that help us “manage the unavoidable,” because the climate will likely destabilize no matter how fast the world brings GHGs under control.

Adaptation will be a harder nut to crack than mitigation. While capping carbon emissions is a daunting challenge to the political will, at least mitigation satisfies the impulse of the polity to build our way out of a dilemma. It is tangible. Its promise of new jobs can be readily grasped. It can be done for profit, and thus attracts private as well as public investment.48 Moreover, we generally know what must and can be done.

Climate adaptation, by contrast, is subtle, unglamorous, and emphatically more difficult. Its benefits are more intangible and elusive, and will require considerable investment in information-gathering and science, which almost certainly will depend heavily upon public funds. It will engage different institutions, require different skills, and be driven by different pressures than those involved in building a green energy economy. While we have some idea of what might be ahead, we do not yet have the tools—i.e., fine-grained models—to predict with confidence how the climate will change in particular locales.49 However, some broad-scale trends are emerging.


A. The Unavoidable Effects of a Destabilizing Climate: Habitat and Biodiversity Destruction

In the arid West, where most federal lands are found, we are becoming more aware of growing climate-related problems of fire, drought, and insect infestations. From 1970 to 2000, the western fire season lengthened by 78 days and the burn duration of large fires quintupled.50 The bark beetle outbreak in the West—which has killed close to eight million acres of trees, and which many scientists think is climate-related—is the largest in recorded history, and is effectively converting the forest from a carbon sink to a carbon source.51

Dramatic events like wildfire, hurricanes, and floods make the nightly news, but civilizations can recover from such sudden catastrophes in a meaningful time frame. Less noticed, yet more permanent, is the ongoing quiet erosion of diverse life on the planet. Famed Harvard naturalist E.O. Wilson thinks the one ongoing development that “will take millions of years to restore is the loss of genetic and species diversity,” and that, he says, “is the folly that our descendants are least likely to forgive.”52

Climate destabilization will accelerate loss of biodiversity in ways that could ultimately eclipse conventional threats like bulldozers, chainsaws, and dams. It alters habitats and changes the timing of seasonal events such as snowmelt and insect emergence. It dries out prairie potholes and arctic wetlands that sustain most of the world’s migratory birds. Such irreversible impacts, when combined with the more conventional threats, lead some scientists to believe that, by the middle of this century, a sizeable proportion of the plants and animals now found on earth may become extinct.53

Nature’s loss is our own. Beyond the moral dimension of preserving as much of creation as we can, Joseph Wood Krutch made the case for self-interest in this regard: “[I]t is not a sentimental but a grimly literal fact that, unless we share the planet with creatures other than our-

selves, we shall not be able to live on it for long.”54 The changes in the
offing will likely undermine what economists call “ecosystem services”: the myriad of ways—from cushioning floods to cleansing water to pollinat-
ing crops—the natural world supports and protects the quality of human life.55 The bark beetle outbreak, for example, is concentrated in
headwaters of the Colorado River, and it does not take much imagination
to see how it may threaten the river’s intensively-used water supply
by accelerating runoff, erosion, and silting up downstream reservoirs.

B. Federal Lands and Adaptation Strategies: Some Recommendations

The broad objective of adaptation is to ensure that lands and associated natural resources have “resilience”; defined, in the Waxman-Mar-
key climate change bill approved by the U.S. House of Representatives,
as the “ability to resist or recover from [climatic] disturbance [so as to] preserve [their] diversity, productivity, and sustainability.”56 What fol-
ows are some thoughts on adaptation in relation to federal lands.57

First, federal lands ought to be on the front lines of the national adaptation effort. If the federal government were to try to use its regula-
tory power to make private land bear much of the burden of biodiversity protection, it would be controversial, fiercely resisted, and arguably not as fair. Many of the benefits of biodiversity conservation are national,
indeed global, in scope, while its immediate costs are more locally con-
centrated. The national political process—accustomed to adjusting the benefits and burdens of economic life in the face of changing condi-
tions—is better suited to the task of distributing the burden of these con-
centrated costs widely.

Second, climate adaptation should be made a central part of the statutory mission of each federal land and water management agency.58

57. Some adaptation strategies are obvious and not pursued further here; for example, using federal lands as storage sites for surface and groundwater to buffer against pro-
longed droughts and loss of snowpack that are likely in our future. For useful thoughts on
58. See, e.g., ROBERT B. KEITER, KEEPING FAITH WITH NATURE: ECOSYSTEMS, DEMOCRACY AND AMERICA’S PUBLIC LANDS (2003); Robin Kundis Craig, “Stationarity Is Dead”—Long Live
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On paper, this would require no great leap. After all, in 1916 Congress directed that national parks be managed in such a way as to “leave them unimpaired for the enjoyment of future generations.” 59 In addition, Congress directed the Forest Service in 1960 and the BLM in 1976 to achieve “sustained yield” and “maintenance in perpetuity” of renewable outputs of the lands under their care, “without impairment of the productivity of the land.” 60 The 1964 Wilderness Act required the “natural conditions” of designated wilderness be preserved so as to retain their “primeval character and influence,” 61 and the 1976 National Forest Management Act spoke of providing for the “diversity of plant and animal communities” on the national forests. 62

Third, strong statutory direction by itself will not do the job. Recent history reminds us that the executive branch must exercise vigorous leadership if progress is to be made. At the end of the Clinton Administration, Interior Secretary Bruce Babbitt directed agencies under his jurisdiction to start incorporating climate change planning into their management. The effort stalled when President George W. Bush was sworn in, and it took persistence by Deputy Secretary Lynn Scarlett to rejuvenate it seven years later. 63

Fourth, adaptive management 64—which has come to mean learning as we go and adjusting accordingly, and which has already become a

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61. Pub. L. 88-577, 78 Stat. 890 (codified at 16 U.S.C. §§ 1131–1136). This definition is somewhat different from the others mentioned because of its more rigid, relatively static objective, which imparts less flexibility to federal land managers.


64. As originally presented by people like Kai Lee and Carl Walters, the idea of adaptive management was to intentionally manage a system to reduce uncertainty, such as in some circumstances to deliberately perturb an ecosystem to learn more about its dynamics. See Kai N. Lee, Compass and Gyroscope: Integrating Science and Politics for the Environment (1993); Carl J. Walters, Adaptive Management of Renewable Resources (1986).
kind of mantra for managing many federal lands—will likely need to be put on steroids for the challenges ahead. Managing for adaptation is somewhat analogous to surfing, where the waves are constantly moving under one’s board. The abundance of federal lands in Alaska will likely provide important testing grounds. Sometimes labeled ground zero for global warming in the United States, with temperatures rising twice as fast as elsewhere, Alaska is already experiencing melting permafrost, glacier retreat, insect outbreaks, wildfires, and other environmental challenges.

Fifth, even with statutory direction and strong executive leadership, federal land agencies will have to make some hard decisions. To take just one example, dust from livestock grazing, off-road vehicles, and other surface disturbing activities in arid regions has been causally linked to accelerated snowpack melting and consequent water supply disruptions. Such adverse impacts will probably require closer scrutiny of these widespread uses of federal lands. There is also a question of what should be done, in the face of rising sea levels, with a multi-billion dollar commitment made a decade ago for restoring the Everglades in South Florida. Answering these questions is not nearly as simple as managing land and resources to protect them “unimpaired,” and retain their “productivity.”

Sixth, lack of data and understanding complicates matters even more. Natural landscapes constantly change for reasons that may have little to do with human influence. We must move as fast as we can to gain the knowledge to make adaptation decisions as intelligently as possible.


67. See supra note 11 and accompanying text.


70. And then there are more tactical questions, such as what to do with Glacier or Joshua Tree national parks if the glaciers melt and the Joshua trees die off, as some think may happen within the lifetime of many now living. See Jeremy Sullivan, Tipping the Balance: How Glacier National Park Is Melting Away, NAT’L PARKS TRAVELER (2007), available at http://www.frommers.com/articles/4450.html (last visited July 22, 2010); NAT’L PARKS CONSERVATION ASS’N, supra note 66.
sible—gathering more information, conducting more research, and developing better models—as well as making sure the land management agencies have all the tools they may need.

Secretary Salazar has recently taken some important initial steps in this regard, announcing a coordinated strategy for responding to the impacts of climate change within and among Interior agencies.71 Money will also have to be found to do all this, a matter taken up further below. But uncertainty cannot be an excuse for inaction on the adaptation front, for there is simply no time to waste. As a recent EPA report put it, land managers will need to “work[ ] with a range of possible changes rather than a single projection, and . . . focus on developing the most appropriate responses based on that range rather than on a ‘most likely’ outcome.”72

Seventh, even while we continue to expect from our federal lands the timber, minerals, recreational opportunities, and other things they have traditionally provided, federal lands may also be called upon to anchor or form the core of a network of “biological reserves” or “climate havens”—large relatively undisturbed areas to preserve as much biodiversity as possible for future generations.73 Containing some of our most diverse and intact ecosystems, they are already a backbone of many landscape-scale biodiversity conservation efforts around the country. The idea is not new. It was advocated long before the climate challenge emerged, as humans spread across the landscape and good habitat shrank.74 Indeed, the case for leaving large areas undisturbed remains powerful because, even though climate change could have major effects on species diversity even in such areas, most conventional development directly transforms habitat with more immediate negative consequences for biodiversity.75 A network of biological reserves might save a relatively large number of species, and could also serve as control plots for


73. These arguments and some others here are developed in Keiter, supra note 58. See also Bradley C. Karkkainen, Biodiversity and Land, 83 CORNELL L. REV. 1 (1997).


75. See generally National Research Council, Perspectives on Biodiversity: Valuing Its Role in an Ever Changing World (1999); Noss & Cooperrider, supra note 74. See also
studying how nature reacts to the changes underway. There are other reasons to do this, of course; as Krutch put it many decades ago: “If we do not permit the earth to produce beauty and joy, it will in the end not produce food, either.” 76

Eighth, it seems clear that federal land “reserves” will not, by themselves, be able to do the job that needs to be done. 77 Other lands, federal and non-federal, will need to be enlisted to maximize the potential of biodiversity and ecosystem services. 78 Maintaining a “connective tissue” of migratory corridors can give ecological communities a chance to advance or retreat across the landscape within the constraints of evolutionary speed limits. 79 If climate changes faster than species can move, we may have to contemplate “assisted migration” or “managed relocation,” where species are transplanted to places with a more suitable climate to survive. 80 There may be a fine line between unwanted, disruptive “invasive” species and these “translocated” species, but drawing that line will probably present only one of many philosophical conundrums to be confronted as the climate destabilizes. 81 There is also discussion about trying to manage such reserves for a kind of “ supersat-


78. See, e.g., Keiter, supra note 58, at 208–18.


uration” of species—trying to maintain a higher diversity in these systems than might otherwise be the case.82

Ninth, just as some species will migrate in the face of climate change, our federal lands will have to do some migration as well, for they are not always in good locations to meet the adaptation challenges ahead. For one thing, they are not always found where biodiversity is richest and most prevalent. Most of our great national parks, for example, were established more for scenery than for protecting biodiversity.83 Many rich riparian ecosystems, having been attractive for settlement and privatization, are not on federal lands. Currently, most federal lands managed primarily for conservation are found at higher altitudes, with thinner soils and fewer species. Some biologically productive areas that are now in federal ownership, like coastal wetlands that anchor many national wildlife refuges, may find themselves rendered useless by rising sea levels.84 A successful adaptation program will need to reconfigure or realign the pattern of federal landholdings with emerging needs.85 In some places, for example, federal lands in the headwaters will need to be reconnected with downstream areas, which may need to be acquired by the federal government, to restore their ecological functioning.86

Tenth, to help drive and fund this biologically and adaptation-driven reconfiguration, some federal lands may need to be divested by exchanges or outright sales. This is not a call for another “sagebrush rebellion,”87 but just as Rachel Carson did not oppose all pesticides, only their indiscriminate excess,88 so it cannot be heresy to say that not every acre of the vast federal domain has to stay in public ownership. In order to help meet the climate challenge head-on, some divestiture—to green

82. See, e.g., Walter V. Reid, How Many Species Will There Be, in TROPICAL DEFORESTATION AND SPECIES EXTINCTION 55, 55–57 (1992); James S. Clark et al., Ecological Forecasts: An Emerging Imperative, 293 SCIENCE 657 (2001).

83. For example, the founding charter for Yellowstone, the world’s first national park, speaks of its “natural... wonders,” 16 U.S.C. § 22 (2008), and of it as a “pleasuring ground,” 16 U.S.C. § 21 (2008).

84. See, e.g., Brad Griffith et al., Climate Change Adaptation for the U.S. National Wildlife Refuge System, 44 ENVTL. MGMT. 1043 (2009).

85. See NATIONAL RESEARCH COUNCIL, supra note 75, at 10–11, 118–20, 138–41; Keiter, supra note 58, at 212.

86. For example, Trout Unlimited has promoted what it calls a “PRRS” operating principle for landscape scale conservation and recovering resilience in natural systems. See Chris Wood, Protect, Reconnect, Restore, Sustain: Achieving TUI’s Conservation Vision, TROUT MAGAZINE, Summer 2007, at 30–35 (Summer 2007).


energy developers, to housing developers, or to others—will probably make political, fiscal, and biological sense.

Federal lands seem to be one of those areas of life—like education, religion, decisions about marriage and having children—where the collective “we” of the body politic neither expect nor want the conventional marketplace to fundamentally guide our decisions. Otherwise, we would not have kept so much land in national ownership for so long despite so many efforts to wrest them away. The essential question for the future of the federal lands is not quantitative (how many acres the national government owns), it is qualitative: where should these federal lands be, what characteristics should they have, and what values should they serve? Echoing President Obama’s remarks about government in general in his inaugural address, the question is not whether the government owns too much or too little land; the question is whether the government owns the right land—the land it needs to meet the challenges of climate destabilization.

VII. MITIGATION AND ADAPTATION EFFORTS MUST BE LINKED

While an overarching federal lands strategy requires intensive efforts on both the mitigation and adaptation sides of the climate equation, it is, for several reasons, crucial that the two initiatives be closely linked. In other words, if we are to have hope of meeting the challenges ahead, federal lands policies should simultaneously, and in a coordinated fashion, connect green energy deployment and other attempts at mitigation with adaptation efforts.

The most obvious reason to link them is so that they do not work at cross purposes with one another—green energy should not thwart adaptation, and vice versa. “Just because it’s clean, doesn’t mean it’s green,” is how one wildlife advocate puts it. Green energy projects cause impacts on the landscape and on biodiversity that need to be offset or mitigated. Conserving other federal lands for adaptation can help mitigate some of these impacts. Determining an adequate level of offset can be difficult because climate change needs to be taken into account in determining the value of the land for mitigation.


90. Interview with Jamie Clark, Executive Vice President, Defenders of Wildlife (June 2009).

Another more subtle reason to connect mitigation and adaptation is frankly political. As I suggested earlier, building a green energy economy has much more political “oomph” than adaptation; while no less urgent, adaptation is much less widely appreciated and harder to do. Adaptation needs to be the caboose on the more carbon-friendly energy policy train.

Equally important, intelligently coordinating climate mitigation and adaptation on public lands will require public money for research and information-gathering, for acquisition, and for managing for adaptation. This is perhaps where the linkage of green energy to adaptation is most important. Simply put, the move to a green energy economy needs to be done in such a way as to help underwrite the costs of adaptation. One way to do this is to dedicate a portion of federal revenue derived from fossil fuel and green energy projects on federal lands onshore and offshore (as well as any program to limit carbon emissions that produces revenue, like “cap-and-trade,” discussed below) to adaptation measures.

Finally, linking adaptation to green energy deployment can also help reduce NIMBY-based opposition to the latter. While providing conservation mitigation for the impact of green energy cannot eliminate NIMBY arguments, it can blunt their effectiveness. It could also make more palatable any package that included shortcuts through environmental laws like NEPA. In short, green energy facilities packaged with biodiversity reserves or new federal conservation areas might be a winning political combination as well as good for the planet.

Fortunately, the basic idea of combining mitigation and adaptation is having some traction. A recent report by a bipartisan panel of experts, the Outdoor Resources Review Group, recommended that any GHG reduction program include funding to adapt lands and waters to the ecological impact of climate change. It also suggested dedicating to conservation some revenue from renewable and conventional energy resource development on public lands onshore and offshore. In the same

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92. See supra text accompanying notes 48–49.
94. OUTDOOR RESOURCES REVIEW GROUP, GREAT OUTDOORS AMERICA 7–9, 51–53 (2009). This blue-ribbon study group was launched at the invitation of Senators Lamar Alexander (R-TN) and Jeff Bingaman (D-NM) in early 2008. Its report also noted that “as climate
vein, the Waxman-Markey climate bill that passed the House in the summer of 2009 dedicates a small portion of expected revenues from the “cap-and-trade” program it would create to fund adaptation measures. 95 Legislation recently passed the House (and has been introduced in the Senate) that would fully fund the Land and Water Conservation Fund (LWCF), the flagship of national land conservation efforts.96 Even if something like this becomes law, however, it may only be a down payment on what could be needed along these lines in the years to come. Finally, comprehensive bills have been introduced in both houses of Congress in recent months to direct and fund comprehensive climate change adaptation efforts.97

VIII. ADAPTATION, RECONFIGURATION, AND BLURRING TRADITIONAL JURISDICTIONAL LINES

Stepping back for a broader view, because climate is the quintessential phenomenon that disrespects political boundaries, it is only natural that the challenge of adapting to a destabilized climate will call those boundaries into some question. Not only will the planet-scale problem require more international cooperation than ever before achieved in human history, but even within the United States, our thinking will have to be “scaled up” above conventional boundaries. This means ways will have to be found to collaborate across the walls that separate federal land managing agencies from each other and that separate them from state and local jurisdictions. It also means a closer look will have to be taken at the line that divides public from private land.

change increases the pressure on public lands to develop renewable and conventional energy resources and transmission capacity, funding also will be needed to reconcile growing conflicts over resource use and mitigate impacts where they cannot be avoided in project design.” Id. at 8, 51.


96. See Consolidated Land, Energy and Aquatic Resources Act (CLEAR), H.R. 3534, 111th Cong. §§ 401–403 (approved July 30, 2010); Land and Water Conservation Fund Amendments, S. 2747, 111th Cong. (sponsored by Senators Bingaman and Baucus). See also Promises on Open Space, N.Y. TIMES, Nov. 10, 2009; Congress and the Spill, N.Y. TIMES, Aug. 2, 2010. LWCF is also discussed further infra note 106 and accompanying text.

A. The Blurring of Traditional Jurisdictional Lines

In the last few decades, all these boundaries have already been blurred. The slow decline of the “enclave” principle means that federal land managing agencies do not have the distinct, dissimilar missions and cultures they once had. Management of nearly all federal lands has for some time been evolving to serve the broader needs to preserve some measure of biodiversity. Adapting to a destabilized climate will require accelerating that evolution, including among other things, reforming the land and resource planning processes that all federal agencies use.

The line between federal and state jurisdiction has likewise become less prominent in recent years, as the federal government and the states have found more common purpose in many areas of natural resource management. In addition, the boundary between public and private land has become much less distinct, as government regulation of private land use has grown, and as more and more private lands are managed with a public overlay. Consider the proliferation of habitat conservation plans. They now burden many millions of acres of (usually private) land with development restrictions in order to comply with the ESA. Or consider the astonishingly rapid acceptance and proliferation of taxpayer-subsidized conservation easements, where rights to develop private land are separated from other attributes of ownership and held for conservation purposes, giving these lands an overlay of a public character.

B. More History Lessons

To be sure, reconfiguring federal lands and modifying traditional boundary lines to meet the needs of green energy and adaptation may
seem daunting. But we have done something like it before with considerable success. In reaction to America’s early history of fast, furious, and sometimes careless land disposal, the Progressive movement not only decided to keep hundreds of millions of acres of land permanently in federal ownership, but also launched the nation’s first significant program to acquire large tracts of private land to bring them into (or, for the most part, back into) national ownership at the turn of the twentieth century. Under the 1911 Weeks Act,103 the national government bought up cutover watersheds in the East, South, and Midwest, to combat floods and build landscape resilience; in other words, although the term was not then in use, these lands were acquired to restore their “ecological services.” These and related programs gave us the national forests now found in New England, the Midwest, and the South; national parks like the Great Smoky Mountains, Shenandoah, and Acadia; the national grasslands in the Great Plains, and dozens of national wildlife refuges across the country. The effort continues. In the last couple of decades, the U.S. government has acquired many millions more acres for conservation purposes.104

Nor is it a new idea to earmark revenues from the exploitation of federal lands to help underwrite the costs of land conservation. Stewart Udall championed that principle and Congress embraced it in the Land and Water Conservation Fund Act of 1965, under which revenues derived from developing federal offshore oil and gas resources are devoted to public land acquisition, conservation, and related programs through the LWCF.105 The LWCF program has a serious limitation, however, in that it is not a true revolving fund, but rather a paper account in the U.S. Treasury—expenditures from which require annual appropriations from Congress. The vagaries of the appropriations process, and the fact that the U.S. budget has been balanced or in surplus for only a handful of years in the last several decades, have kept LWCF appropriations to a small fraction of the amount accruing annually in the paper account.106

To head off this result, a true revolving fund or “dedication” of money, exempt from the appropriations process, would be needed.107

107. An idea that is currently being promoted. See supra text and sources accompanying note 96.
A crucial question is whether the political will can be mustered to address these challenges to federal lands. Because the current “great recession” has often been described as the worst since the Great Depression of the 1930s, it is appropriate to examine the conservation record of Theodore Roosevelt’s distant cousin. When Franklin Delano Roosevelt (FDR) took office, the nation’s rural areas had been in a severe depression for a decade, and drought had led to the famous Dust Bowl in the Midwest. 108 Indeed, major dust storms brought western soil to the steps of the Capitol in Washington, D.C., in the late spring of 1934, prompting Oklahoma Senator Thomas Gore to remark that it was the “most tragic, [and] the most impressive lobbyist, that [has] ever come to this Capitol.” 109

America called upon FDR to respond forcefully, and he did, on many fronts. He created the Soil Conservation Service and the Civilian Conservation Corps. He multiplied and accelerated reforestation, restoration, and federal land acquisition efforts. 110 At the same time, he forcefully intervened to protect some national land treasures from inappropriate development. 111 In short, economic meltdown and national crisis led to more federal land acquisition and conservation, not less. If one thinks of climate destabilization as our generation’s Dust Bowl, albeit on a global scale, FDR’s model of vigorous action using federal lands as a key tool is well worth emulating.

IX. CONCLUSION

Like the threat of nuclear war, climate change poses a huge challenge for humanity. As federal lands are enlisted in the crusade to meet the challenge, much about them—where they are located, how they are managed, even how they may be defined—will likely change. In this sense, they are a microcosm of the caliber of changes humans and their institutions will likely face across the globe.

Theodore Roosevelt and the other Progressives understood the powerful connection between federal lands and the larger society. They built on an idea of Ralph Waldo Emerson’s; namely, that “the views of


111. IRVING BRANDT, ADVENTURES IN CONSERVATION WITH FRANKLIN ROOSEVELT 93, 125 (1989).
nature held by any people determine all its institutions.” They had a kind of basic faith in the power of federal lands to shape our character and our identity, to connect us as a people, and to make us and our society better. That power will be tested again, for if we are to face down the challenge before us, we will need to find ways to overcome historic antagonisms that have divided development interests from conservation interests, and states from the national government. Truly, we are all in this together.

Mo Udall, one of the most revered members of Congress in the last century, adept at working across party lines and, not incidentally, a giant of public land policy, once said: “Politics and issues come and go, but in the end, we’ll all be remembered for the way we treat other people.” Profoundly wise words, but I will be cheeky enough to add an addendum—and I do not think Mo would object—that we will also be remembered for the way we treat the federal lands.

The magnitude of the task suggests that we need a second coming of Theodore Roosevelt to meet it. Is Barack Obama ready to assume that mantle? It is worth noting that when he signed landmark public lands conservation legislation into law, in the spring of his first year in office, President Obama quoted Theodore Roosevelt: “I recognize the right and duty of this generation to develop and use the natural resources of our land; but I do not recognize the right to waste them.”

The baby boomer generation has been described as cannibalizing the future to provision the present. Planners are comfortable using a discount rate to weigh present against future investments. But on climate policy, discounting the future seems, essentially, to be telling our children they are worth less than us. This cannot be.

Like Theodore Roosevelt and the Progressives, we must embrace large federal landholdings as a shared patrimony—a precious heritage which binds us to our ancestors and which we, in turn, hold in trust for future generations. It is our heavy responsibility to manage these assets

112. Ralph Waldo Emerson, The Works of Ralph Waldo Emerson, in ENGLISH TRAITS AND REPRESENTATIVE MEN 40 (1883).
wisely, so that they continue to serve generations to follow, just as they can help us overcome the crisis we face today.

Most Americans, myself included, are incurable optimists. President Obama’s Chief of Staff, Rahm Emanuel, famously said shortly after the election that one “should never let a serious crisis go to waste.”\textsuperscript{117} While a destabilized climate could be the mother of all crises, there is a lot we can do to mitigate, adapt, and minimize that third option of suffering. But there is much to do, and no time to waste. The choice before us, as President Obama has said, is “not between saving our environment and saving our economy . . . [it’s] a choice between prosperity [in its broadest sense] and decline.”\textsuperscript{118}

